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Applying Decision Analysis to Real Problems

A Behavioural View of Decision Making

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Are we good decision makers?

- The majority of people think that they are better than average drivers.
- The majority of people think that they are better than average decision makers.
- The majority of successful people think that they are much better than average decision makers.
- Are you successful?

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Perception and judgement

- are culturally referenced.
- Groups may not be as representative as they think.

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Framing Issues

Imagine that you are a public health official and that an influenza epidemic is expected. Without any action it is expected to lead to 600 deaths. However, there are two vaccination programmes that you may implement:

- Programme A would use an established vaccine which would save 200 of the population.
- Programme B would use a new vaccine which might be effective. There is a 1/3rd chance of saving 600 and 2/3rds chance of saving none.

Framing Issues

Imagine that you are a public health official and that an influenza epidemic is expected. Without any action it is expected to lead to 600 deaths. However, there are two vaccination programmes that you may implement:

- Programme A would use an established vaccine which would lead to 400 of the population dying.
- Programme B would use a new vaccine which might be effective. There is a 1/3rd chance of no deaths and 2/3rds chance of 600 deaths.

Framing

- Negative framing $\Rightarrow$ risk proneness
- Positive framing $\Rightarrow$ risk aversion

Example 2

- Who is more likely to be mugged in an inner city area:
  – You
  – An old age pensioner?

Availability

An event seems more likely if you can remember ones like it; so memorable events seem more likely

Plausible/   Recent   Dramatic
Imaginable

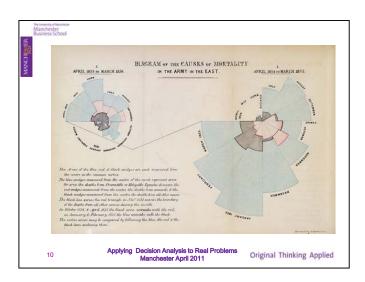## Judgements of Uncertainty

- Which is further east: Bristol or Edinburgh?
- Florence Nightingale was the first female fellow of the Royal Statistical Society: True or False?
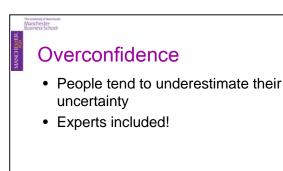- The Euro will be adopted as the currency of all the EU by 2025. True or False?

In all cases: how likely are you to be right?

Overconfidence

- People tend to underestimate their uncertainty
- Experts included!

Psychological 'Biases'

- There are lots of 'biases'
  - Framing
  - Availability
  - Ignoring base rates
  - Misconceptions of randomness
  - Anchoring
  - …

Overcoming overconfidence

- Recognise/reflect on judgement process
- Build feedback into process
- Develop own calibration questions
- Train

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Elicitation

- Beware of anchoring
  - Try not to volunteer any numbers
  - Bracket values, working up *and* down
- Ask for reasons and background data
- Consistency checking of
  - Values
  - Reasons
- Reflect back on similar situations
- Role play stakeholders
- Watch for tiredness
- Use sensitivity analysis to prioritise elicitations
- Reassure .... *carefully*

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System 1 and System 2 thinking

- System 1
  - 'intuition' or 'gut reaction'
  - superficial analysis/interpretation of the relevant information
  - based on much simpler forms of thinking on the fringes or outside of consciousness.
- System 2
  - conscious analytical thought
  - detailed evaluation of a broad range of information
  - often based on a rule that is assumed to provide the 'correct' answer or solution;
  - Note System 2 does not mean forgetting emotions and values.

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Internal Communications

- Be aware of your own perspective, attitudes and values
- Anticipate conflict and disagreement
- Deal with value differences prior to establishing strategy
- Employ third parties to resolve ongoing disputes
- Be reflexive and self-critical
- Establish the integrity of data
- Identify and act on data and knowledge, with due recognition of uncertainties
- Do not attempt to conceal uncertainties
- Admit fault and failings while sharing successes
- Use scenario planning to predict risks and explore contingencies
- Allocate roles within teams to cover all bases

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External Communications

- Establish an ongoing dialogue with close stakeholders groups
- Make use of prior consultation to enhance credibility
- Be sensitive to issues which may cause alarm
- Use media triggers to predict possible media responses, and develop positive media triggers
- Know who your publics are, what their concerns are and who they trust
- Tailor communications strategy according to the stakeholders involved
- Involve affected parties in the decision making process
- Provide information about the nature of the issues, future actions and any residual uncertainties

In summary

Analysis:

1. Create questions

2. Question questions   **Challenge**

3. Answer questions

4. Question answers   **Challenge**

Alistair Carruthers