

# **RISK PERCEPTION AND NUCLEAR ENERGY**

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# STRUCTURE OF THIS TALK

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- Accuracy of perceived risk
- Acceptability of risks
- The role of risk characteristics
- The role of emotions
- The role of (nuclear) accidents
- The communication of risks
- Conclusion: A future for nuclear energy?

# Accuracy of perceived risk

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- small probabilities are overestimated
- large probabilities are underestimated
- risks that are cognitively available tend to be overestimated
  - increased availability due to
    - vividness, catastrophic nature
    - media coverage
    - own experience

# Accaptability of technological risks (1)

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- Nuclear risks tend to be seen as unacceptable due to a number of qualitative characteristics such as perceived uncontrollability, the seriousness and magnitude of possible consequences, and fear

# Accaptability of technological risks (2)

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- Magnitude of negative outcomes is more important than their exact (small) probability

# Accaptability of technological risks (3)

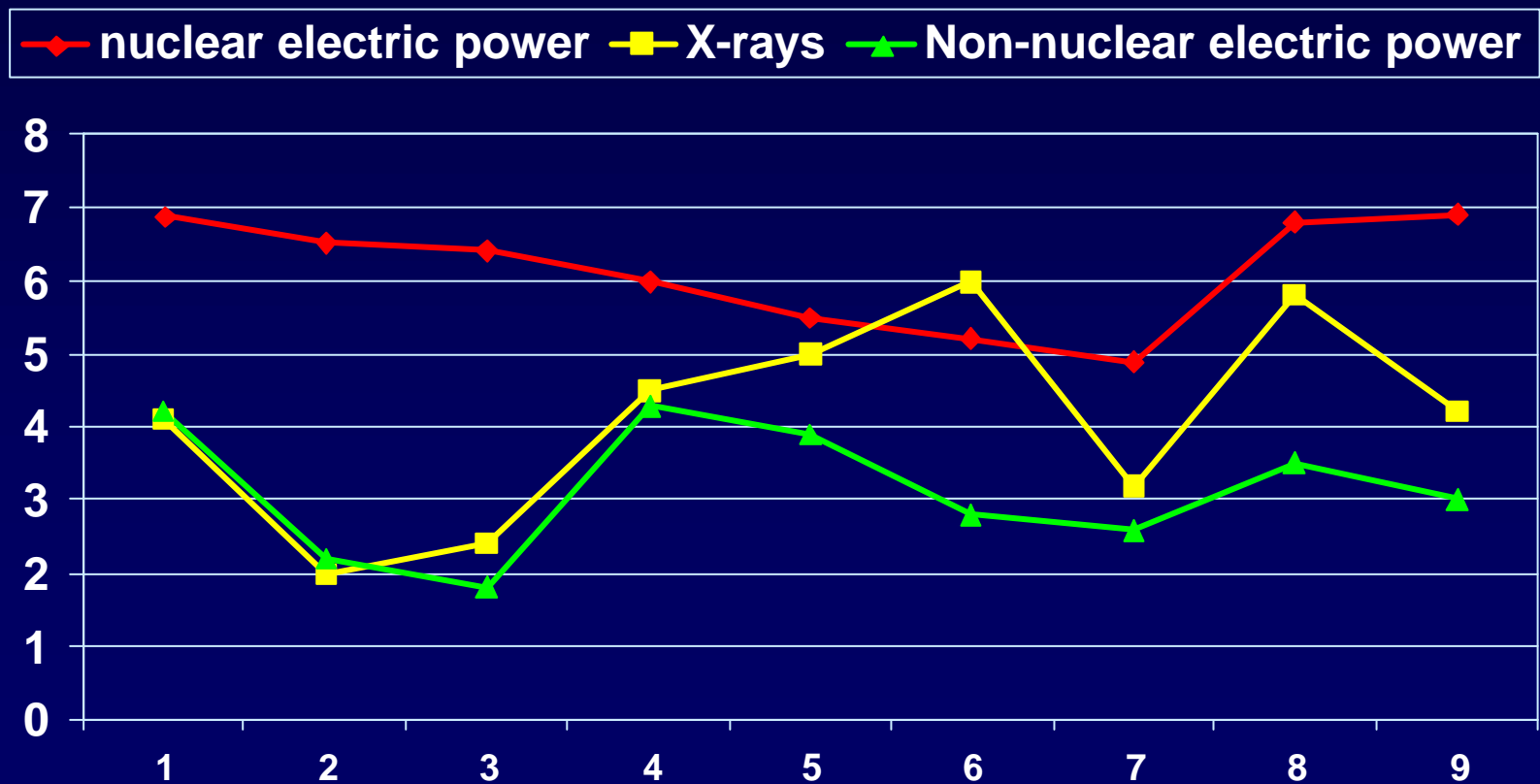
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- At a local level (in siting procedures) an added factor concerns the inequity of the risk-benefit ratio

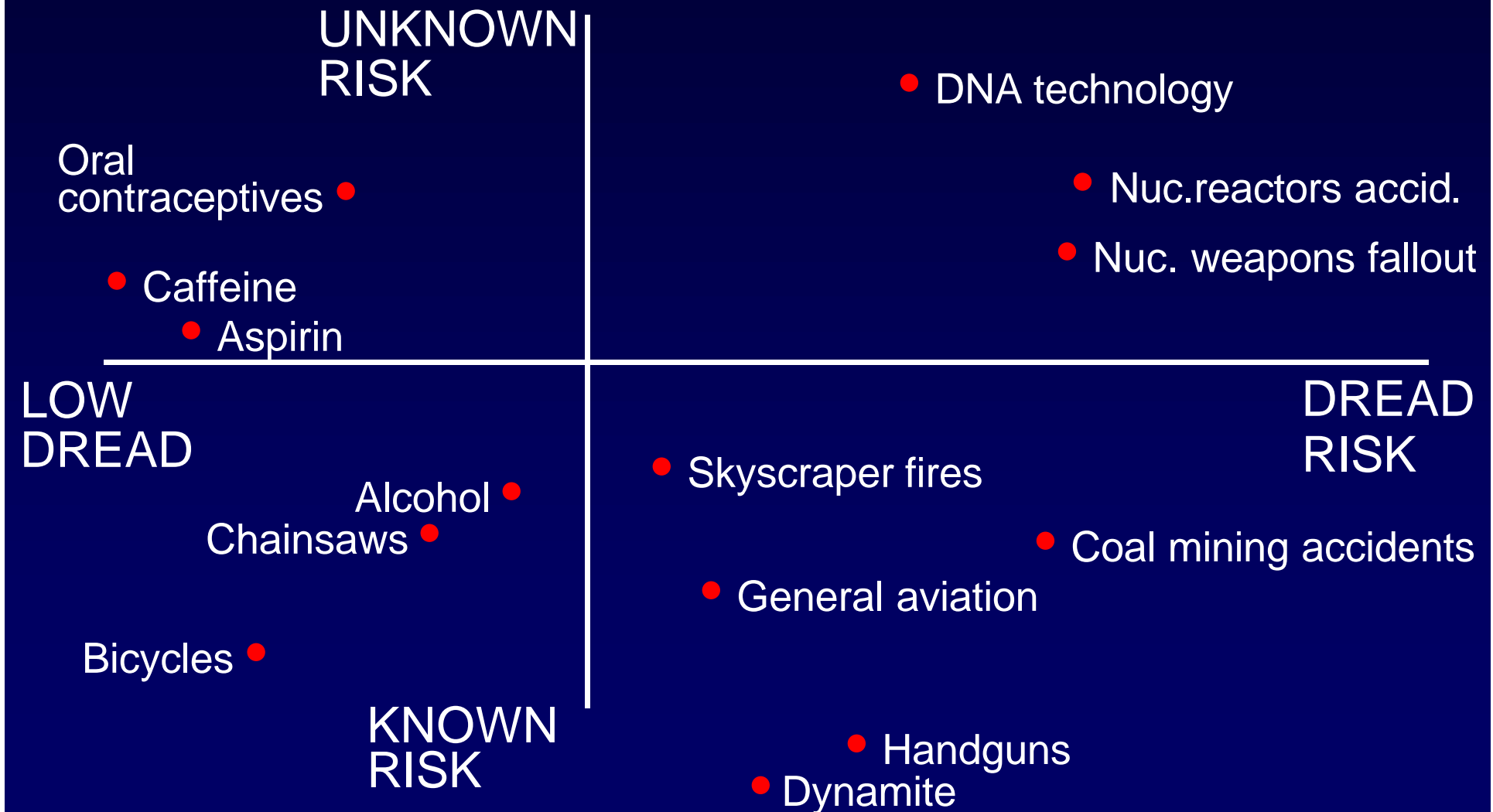
# Risk profiles for nuclear electric power compared with X rays and non-nuclear power

Source: Fischhoff et al. 1978, p. 147

- Catastrophic
- Dread
- Fatal
- Uncontrollable
- New

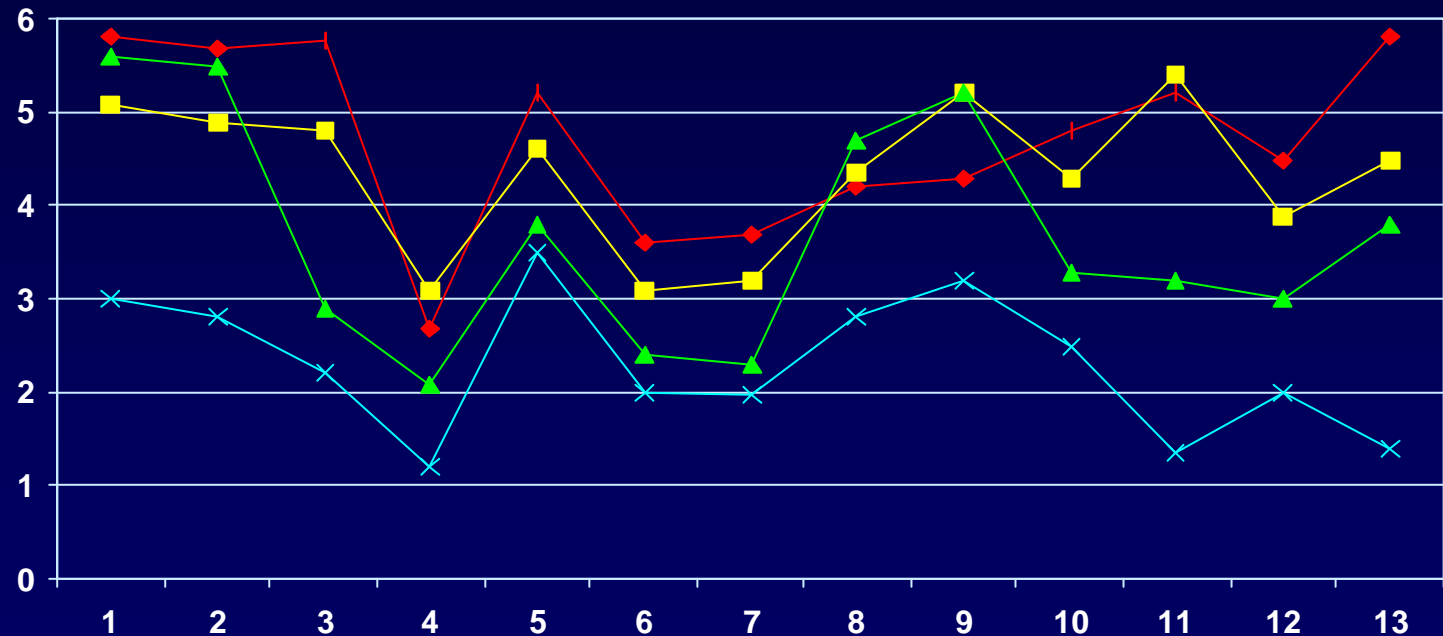


# Risks of activities and technologies in two-factor space (Source Slovic, 1978)



# Risk profiles for nuclear selected hazardous facilities

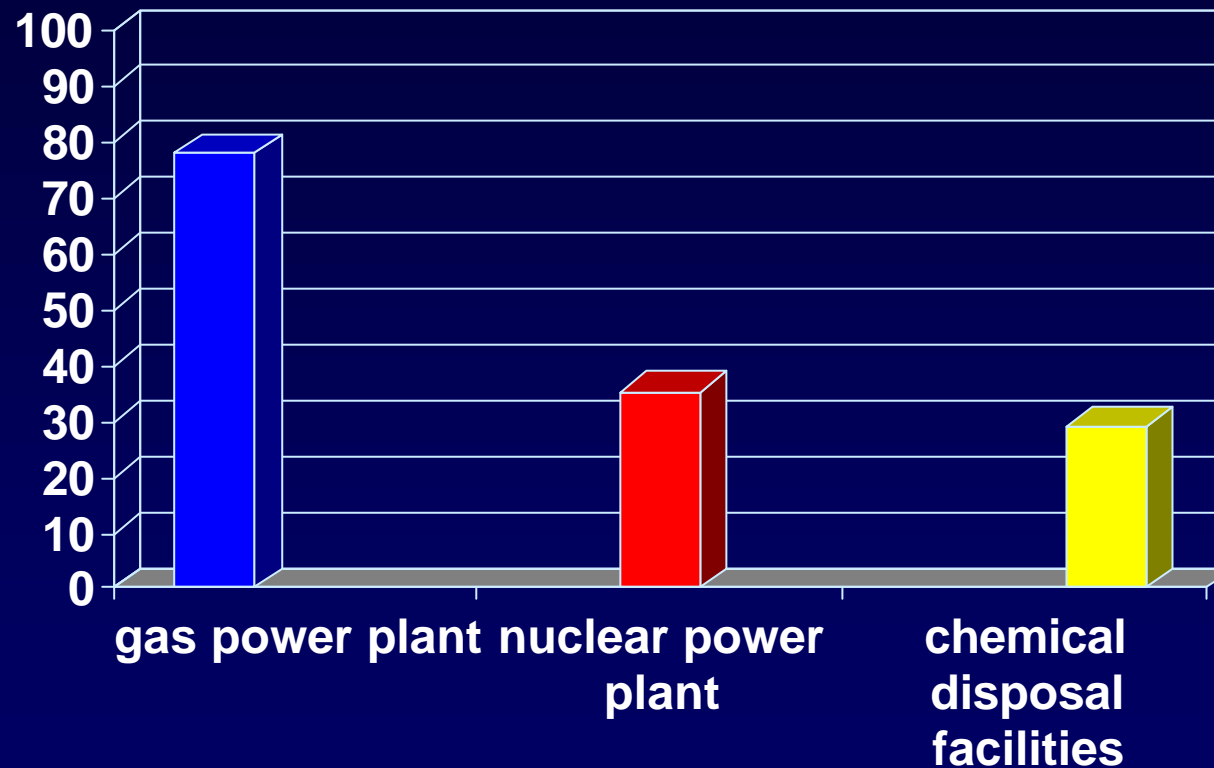
Source: Lindell and Earle, 1983, p. 250



- Affects people
- Unknown to exposed
- Catastrophic
- Dread
- Comparatively risky

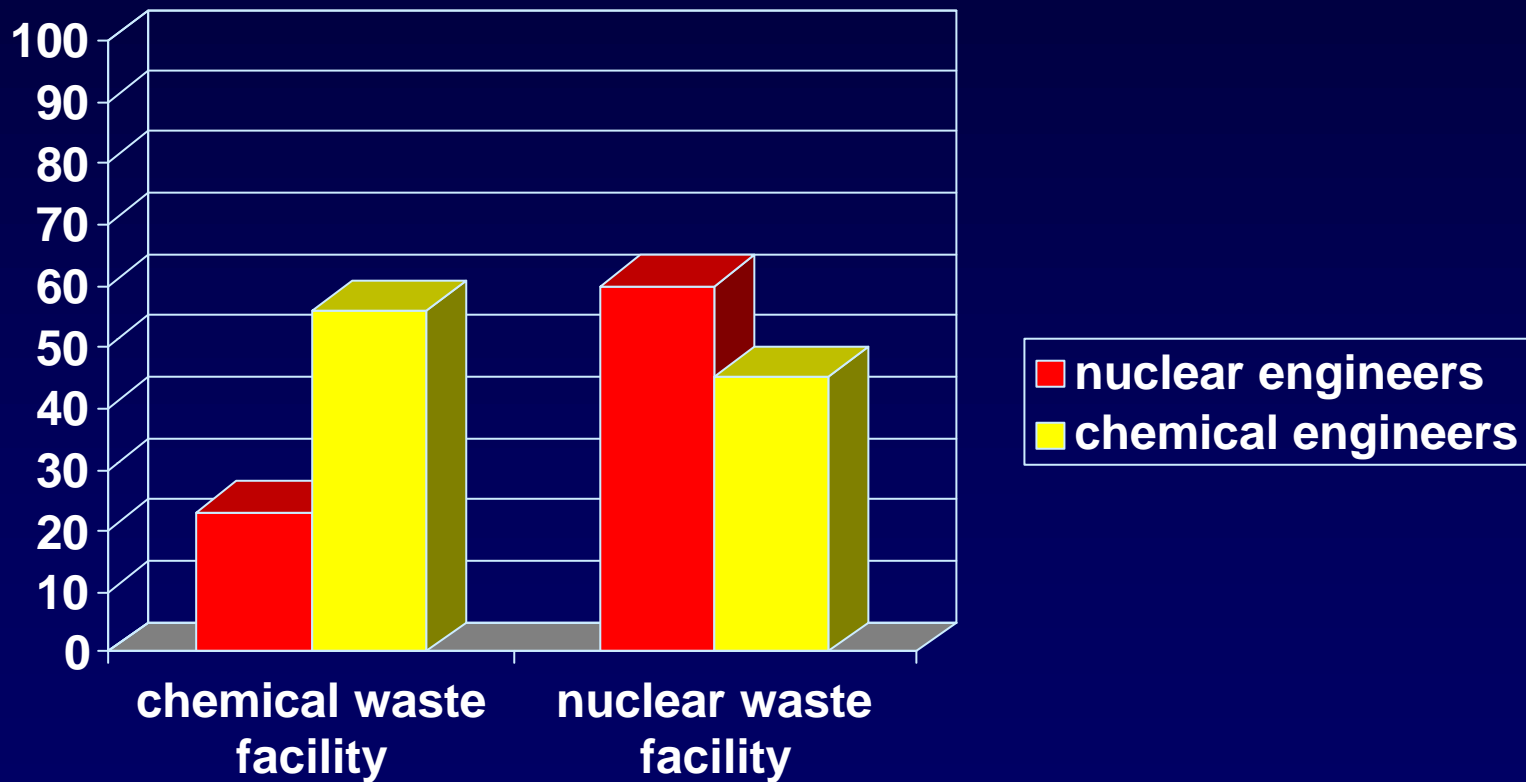
# Willingness to work within 10 miles of various facilities

percentage



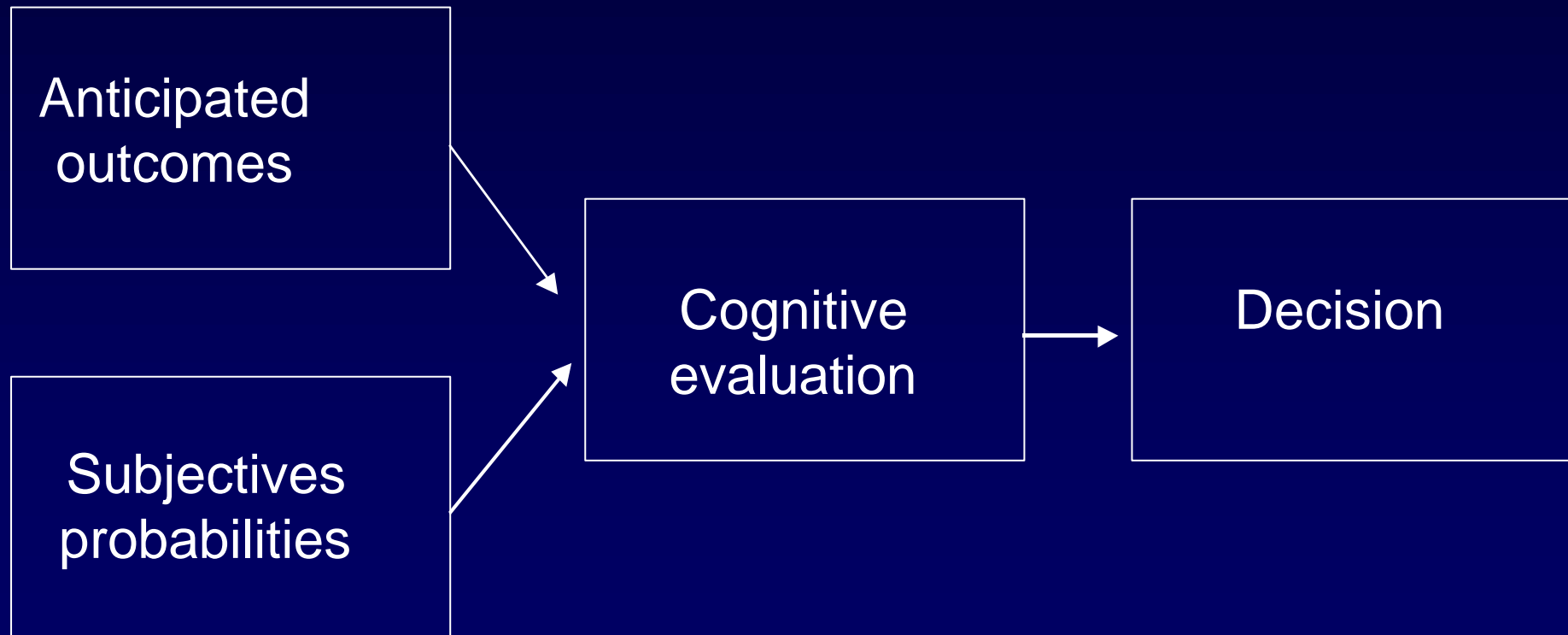
# Willingness to work within 10 miles of chemical vs. nuclear facility

percentage



# The role of emotions

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# The role of emotions

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## ■ Fear/Dread

- > uncontrollability
- > immediacy
- > perseverance

## ■ Regret

- > preference for no-regret options by local decision makers

# Effects of major accidents (1)

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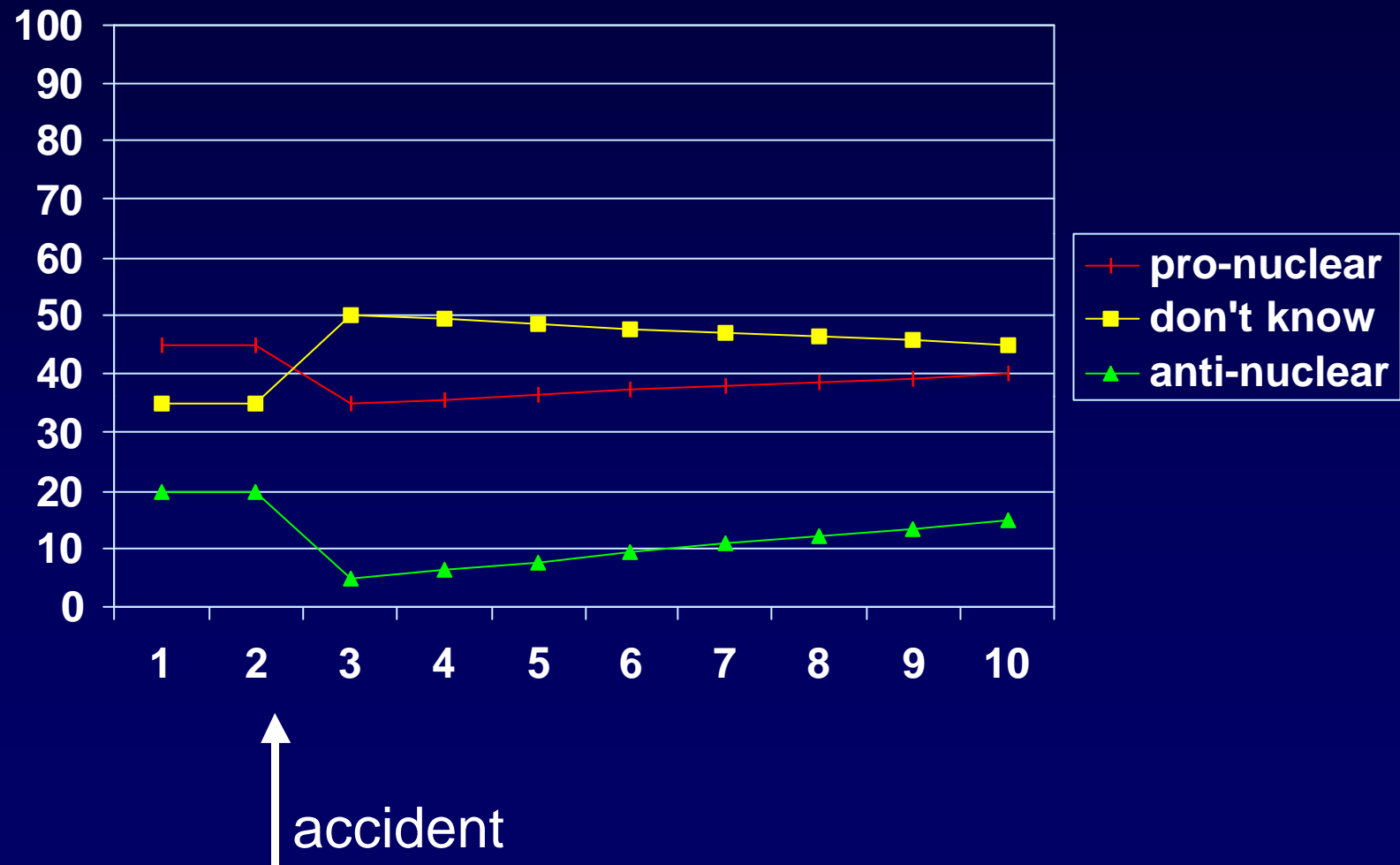
- At local level:
  - Long term psychological, behavioural and physiological consequences

# Effects of major accidents (2)

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- At (inter)national level:
  - public support for nuclear energy declines
  - decrease in uncertainty about taking a stand on the nuclear issue
  - these trends are also reflected in opinion polls about the local construction of nuclear facilities
  - effects are long lasting
  - small accidents serve as a reminder of larger accidents

# The role of nuclear accidents



# Risk communication

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## ■ Problems:

- Conflicts about data and statistics
- Conflicts about estimates and probabilities
- Conflicts about assumptions and definitions
- Conflicts about risk-cost-benefit trade-offs
- Conflicts about the distribution of risks, costs and benefits
- Conflicts about more general values

# Risk communication

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- Problems revisited:
  - complexity of the issue
  - uncertainty
  - changing perspectives (increased knowledge)
  - frame of reference
  - trust and credibility
  - involvement and concern

# Conclusions

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- Respect the frame of reference of the opponent
- Increased controllability not only by industry but also by (local) political decision makers and other agencies
- Address all these aspects explicitly
- Communication is essential