Evidence Integration in Chemical Assessments:
Challenges Faced in Developing and Communicating
Human Health Effect Conclusions

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- Summary of recent workshops on evidence integration and systematic reviews
- Existing challenges on clarifying what is mechanism and what is biological plausibility
- Differences and commonalities in systematic reviews of public/clinical health & toxicology

- IARC/Canadian approaches
- GRADE/OHAT concepts
- What are we rating our certainty in? What is the final message – differs between hazard and risk assessment
- Mechanisms required to understand exposure – outcome relation?
- Avoid research waste

- PECO framework to rate indirectness
- Case studies and more on Bradford Hill
- Machine learning/AI – what are its applications?

- Down to earth --- predictive modelling --- but how confident in your conclusions when extrapolated to people (animals)

- OHAT evidence integration on traffic related air pollution

- Data - risk of bias? – exclusion of evidence

- Value of Systematic Reviews

Systematic review primer

CrossMark

REVIEW ARTICLE

A primer on systematic reviews in toxicology

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Thrombolysis in Myocardial Infarction
Cumulative Systematic Reviews

Antman et al., JAMA, 1992; 268: 240-248
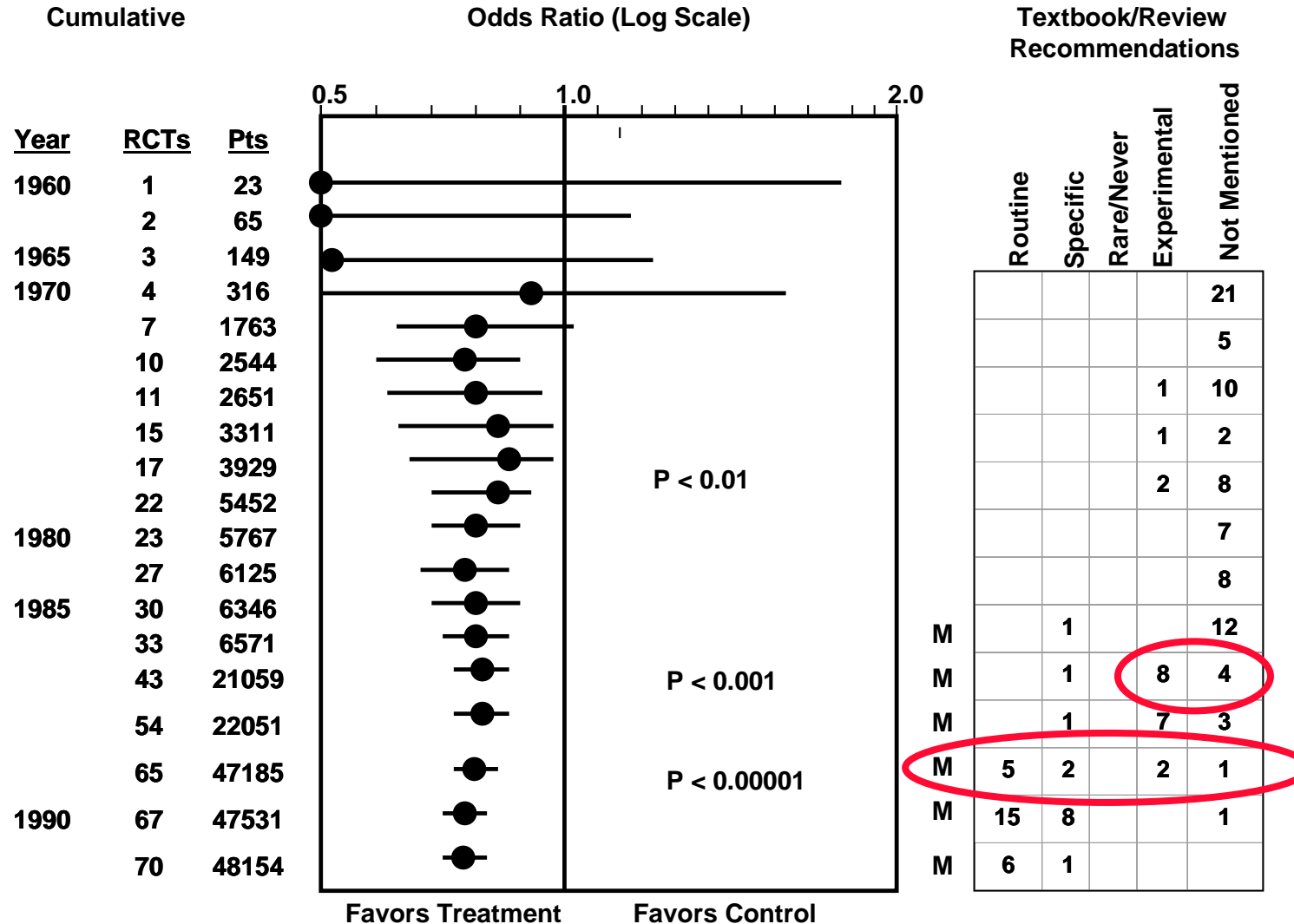
Negative Systematic Reviews
Lidocaine in Myocardial infarction
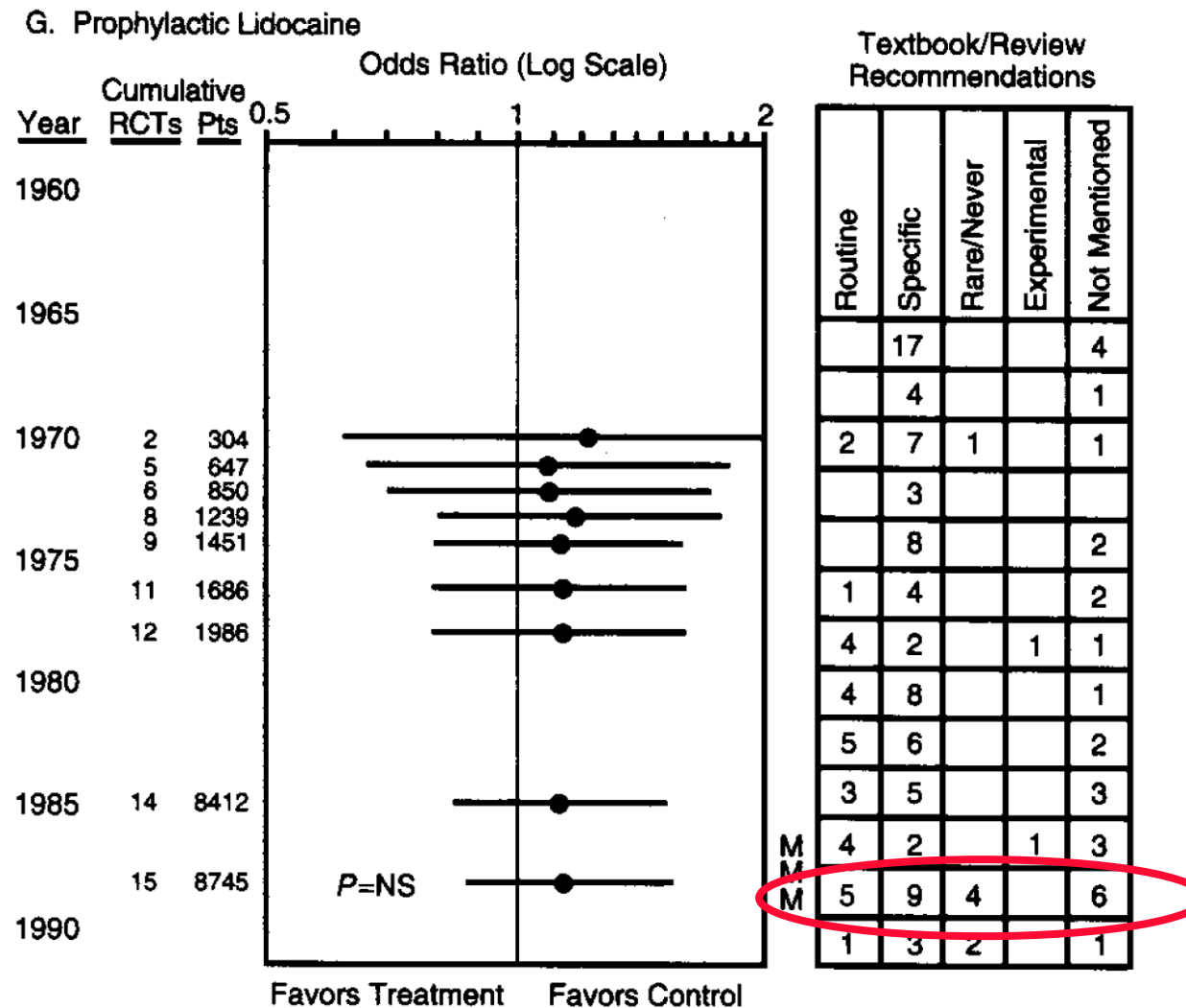
Antman et al., JAMA, 1992; 268: 240-248

- Six step strategy to support decisions about exposures and test agents
- Elements of PRISMA and systematic reviews
- Short term or ultra short term risk assessments
- Clinical applications of evidence integration – how mechanistic evidence can inform evidence assessment

Certainty in the evidence

Interventions

- In vitro/In silico
- In vivo (animals)
- Human non-randomized studies/RCTs in animals

- RCTs in humans

Exposures

- In vitro/In silico
- In vivo (animals)
- Human non-randomized studies/RCTs in animals

- RCTs and natural experiments in humans

What's next?

- Systematic review methods upon you
  - friend or foe "new" in evidence integration
  - pillars of systematic reviews and evidence integration
  - cave: don't let traditional thinking and approaches determine the utility or application of systematic review methods (or make it fit) – scrutiny is good but need to leave some of the tradition behind
- Pragmatic but decision and human-focused methods required for evidence integration – we don't have many answers yet
- Need for more case studies with detailed problem formulation and integration of evidence that provides an answer to a PECO question - future workshops
- Keep on collaborating