

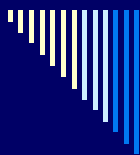
Systematic review of literature

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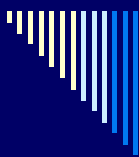
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Summary: SRs are useful

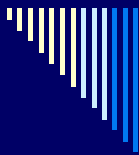
- Information overload
- Biased recommendations
- Timely response
- Subgroup analyses
- Clinical practice guidelines and decision models
- Research needs
- Duplications / unnecessary studies!



Information overload

- ... or explosion!

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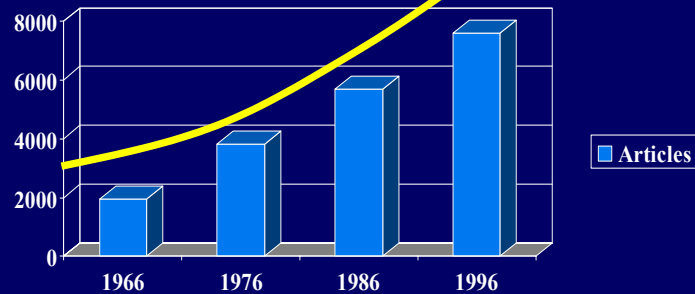
Annually

- **> 3 million articles**
- **> 30,000 journals**
- *... but one might say not all matter to them*

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Information overload

Number of articles on Hypertension cited in Medline by Year

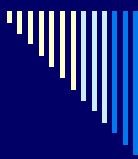


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The problems are that ...

- Too much information, too little time
- Many **too poorly done** or **insufficiently relevant** to be clinically useful
- Many have **conflicting results**
- On top of these, high quality information is often not easy to find

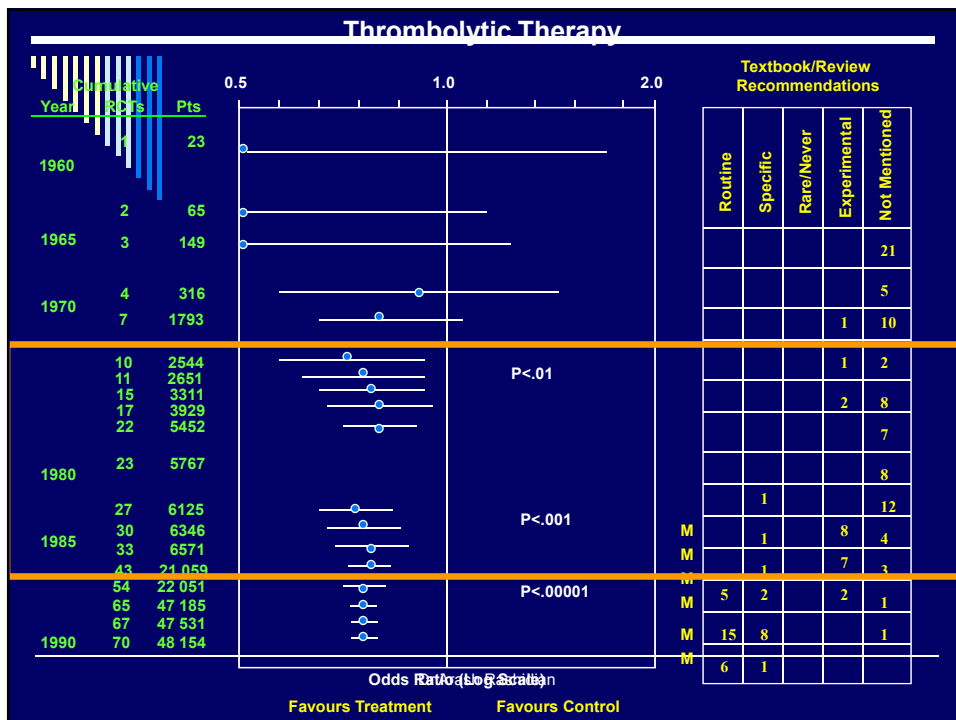
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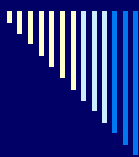


Timely response

- A classic example: streptokinase in myocardial infarction
 - First trial published in 1959
 - 15 trials published up to 1977
 - Introduced as normal practice in late 80s
 - Meta-analysis of treatments in 1992: fall in mortality by 1977, after inclusion of 15 trials

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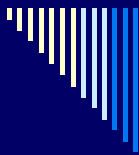




Timely response (Eg credit to Glasziou)

- Another example Hormone Replacement Therapy (HRT)
 - What is the best evidence now on its effects and side effects?
- A systematic reviews of trials had shown no effect on cardiovascular disease and possible harms, Hemminki & McPherson K, BMJ, 1997, 315, 149-53.
- This was largely ignored until the Women's Health Initiative mega-trial

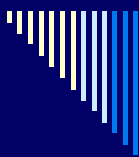
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Timely response (Eg credit to Glasziou)

- Do you think the evidence has changed practice?
- Even after the mega-trial, change in practice has occurred but not been universal, Blumel et al, Menopause, 2004

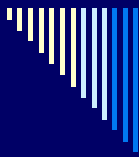
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Systematic reviews

- Postdam Consultation on Meta-analysis (Cook et al, 1995) defined a systematic review as
- **"application of scientific strategies that limit bias to the systematic assembly, critical appraisal and synthesis of all relevant studies on a specific topic"**

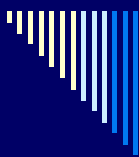
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Systematic reviews

- **Systematic review** is a method of
 - locating,
 - appraising,
 - and synthesising evidence
 - while making explicit efforts to limit bias
- > a quarter of a century since Gene Glass coined the term "meta-analysis" to refer to the quantitative synthesis of the results of primary studies

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Traditional (ordinary) reviews?

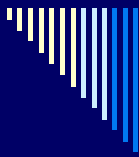
- Unfortunately not much reliable

Professor Paul Knipschild has described how

Nobel prize winning biochemist Linus Pauling used selective quotes from the medical literature to "prove" his theory that

Vitamin C helps you live longer and feel better.

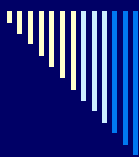
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Systematic reviews are the same as ordinary reviews, only bigger!

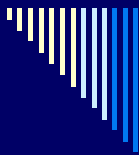
- not simply "comprehensive"
- but to answer a specific question
- to reduce bias in the selection and inclusion of studies (language, database, publication, reporting, citation, multiple publication)
- to appraise the quality of the included studies
 - *Internal validity*: minimised systematic error (bias)
 - *External validity*: generalisability of findings
- to summarise them objectively

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They are different!!

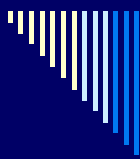
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Further benefits

- Epidemiology of results (Egger, Davey Smith 1997)
- Subgroup analyses
 - Issues of sample sizes and problems of designing studies
- Multiple outcomes
- Duplications / unnecessary studies!
 - e.g. MRC policy

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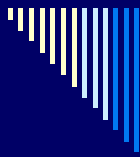


Further benefits ...

- Developments of evidence-based clinical practice guidelines and decision models

- Identifying research needs

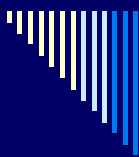
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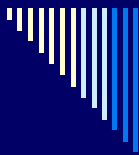
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Cautionary notes!

- First, systematic reviews **are NOT** substitute to good quality primary research

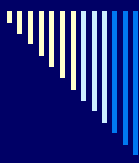
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They are also prone to biases

- A 2000 review of SR and MA for asthma
 - 40 had serious or extensive flaws

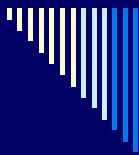
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Another example: magnesium for infarction

- a substantial fall in mortality was evident by 1990, after inclusion of seven trials
- a meta-analysis (1993): magnesium treatment represented an "effective, safe, simple and inexpensive"
- should be introduced into clinical practice without further delay
- Negative results of ISIS 4 (the fourth international study of infarct survival) 1995

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