

Evidence-Based Research: Bridging Past Evidence and Future Studies

2nd National Graduate Student Symposium on Health Sciences
with International Participation

Hans Lund

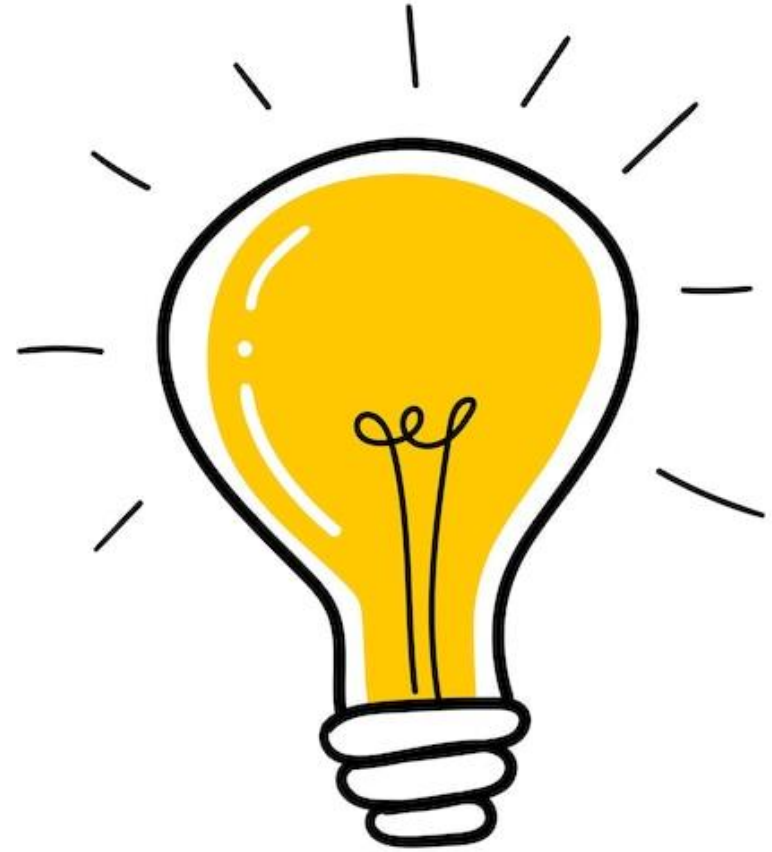
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Imagine ...

... you are having a great idea for a new scientific study



An example

Rev Bras Anesthesiol
2007; 57: 1: 32-38

ARTIGO CIENTÍFICO
SCIENTIFIC ARTICLE

Efeitos do Tratamento Prévio com Lidocaína, Paracetamol e Lidocaína-Fentanil por Via Venosa na Dor Causada pela Injeção de Propofol. Estudo Comparativo*

Effect of Pretreatment with Lidocaine, Intravenous Paracetamol and Lidocaine-Fentanyl on Propofol Injection Pain. Comparative Study

Khaled M. El-Radaideh¹

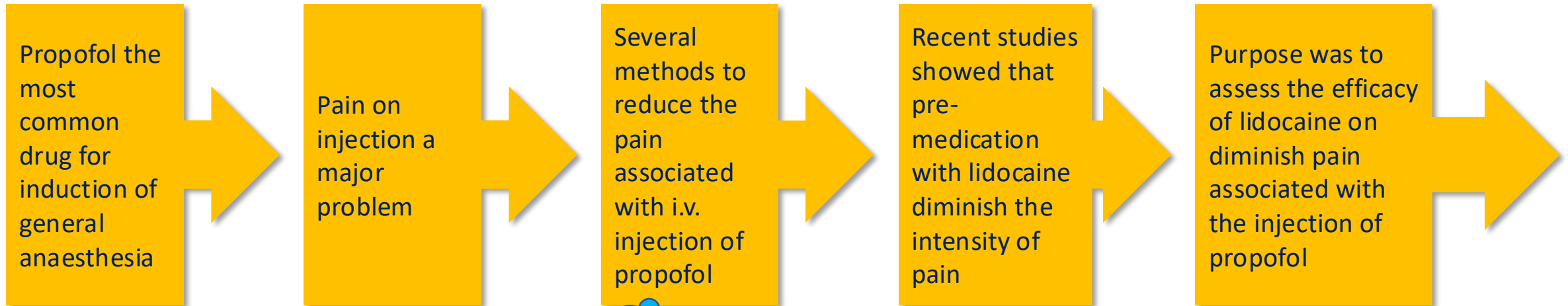
RESUMO

na-fentanil não foi significativa. O paracetamol foi muito superior

From

El-Radaideh KM. Effect of pretreatment with lidocaine, intravenous paracetamol and lidocaine-fentanyl on propofol injection pain. Comparative study. Rev Bras Anesthesiol 2007;57:32-8.

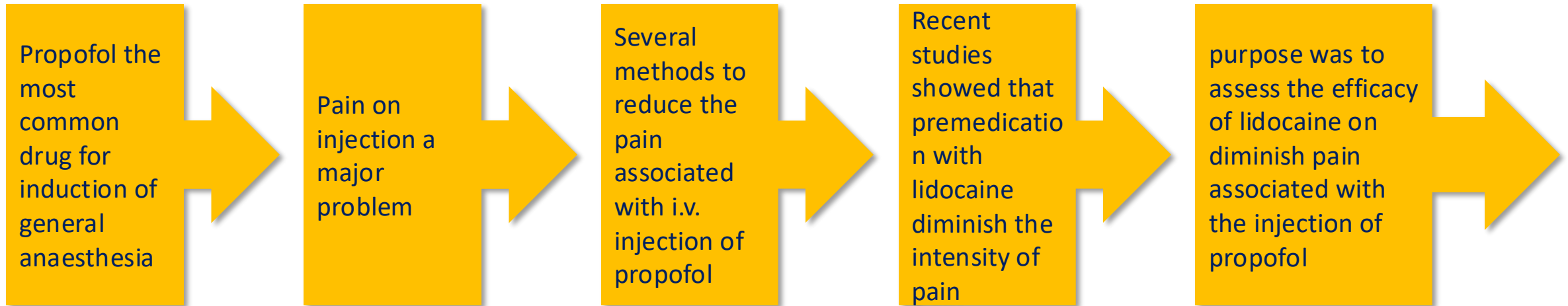
An example: Chain of arguments in the Background



Propofol in different temperature (1-4), lidocaine mixed with propofol (5,6), lidocaine pretreatment without (7) or with tourniquet (8). Furthermore, multiple agents have been administered such as metoclopramide (9), nitroglycerin (10), procaine (11), prilocaine (12), opioids (7) and ketorolac (13,14)

From
El-Radaideh KM. Effect of pretreatment with lidocaine, intravenous paracetamol and lidocaine-fentanyl on propofol injection pain. Comparative study. Rev Bras Anesthesiol 2007;57:32-8.

An example: Chain of arguments in the Background



RESULTS:

Lidocaine significantly reduced propofol injection pain more than placebo (in 68 %) ($p < 0.05$).

From

El-Radaideh KM. Effect of pretreatment with lidocaine, intravenous paracetamol and lidocaine-fentanyl on propofol injection pain. Comparative study. Rev Bras Anesthesiol 2007;57:32-8.

However ...

This study by El-Radaideh (Submitted for publication 24 March 2006) turns out to be redundant and unnecessary – together with 86 other similar studies !



In 2000 ...

Picard & Tramér published a systematic review in 2000 with this title:
Prevention of Pain on Injection with Propofol:
A Quantitative Systematic Review
They identified and included 56 studies
(with 6264 patients) and concluded:

“IV lidocaine (0.5 mg/kg) should be given with a rubber tourniquet on the forearm, 30 to 120 s before the injection of propofol; lidocaine will prevent pain in approximately 60% of the patients treated in this manner.”

Prevention of Pain on Injection with Propofol: A Quantitative Systematic Review

Pascale Picard, MD*, and Martin R. Tramèr, MD, DPhil†

*Consultation de la douleur, Service de pharmacologie clinique, CHU, Clermont-Ferrand Cedex, France; and †Division d'Anesthésiologie, Département APSIC, Hôpitaux Universitaires de Genève, Genève, Switzerland

... intervention to prevent pain on injection with ... is unknown. We conducted a systematic liter- ... (Medline, Embase, Cochrane Library, ... hies, hand searching, any language, up to ... 1999) for full reports of randomized com- ... algesic interventions with placebo to pre- ... We analyzed data from 6264 patients ... 56 reports. On average, 70% of the ... in on injection. Fifteen drugs, 12 ... s, and combinations were tested. ... given with a tourniquet 30 to ... propofol, the number of ... to prevent pain in ... received pla- ... lidine 40 mg

with tourniquet (NNT 1.9) and metoclopramide 10 mg with tourniquet (NNT 2.2). With lidocaine mixed with propofol, the best NNT was 2.4; with IV alfentanil or fentanyl, it was 3 to 4. IV lidocaine before the injection of propofol was less analgesic. Temperature had no significant effect. There was a lack of data for all other interventions to allow meaningful conclusions. The diameter of venous catheters and speed of injection had no impact on pain. **Implications:** IV lidocaine (0.5 mg/kg) should be given with a rubber tourniquet on the forearm, 30 to 120 s before the injection of propofol; lidocaine will prevent pain in approximately 60% of the patients treated in this manner.

(Anesth Analg 2000;90:963-9)

... tested, the group with propofol (as manufac- ... regarded as a “no treatment” control. For ... hen cold (i.e., 4°C) propofol was tested, ... room temperature (i.e., 23°C) was re- ... control. We searched the MEDLINE ... Med, from 1966 to September 1999), ... (1999, issue 3), and EMBASE ... 1999) databases without re- ... n language and by using differ- ... the free text key words

Oh, but ...

... El-Radaideh did cited this review by Picard and Tramér:

From the Discussion section:

“The incidence of pain on injection of propofol has been reported to be 70% (Picard and Tramér, ref 19)” (Page 37).

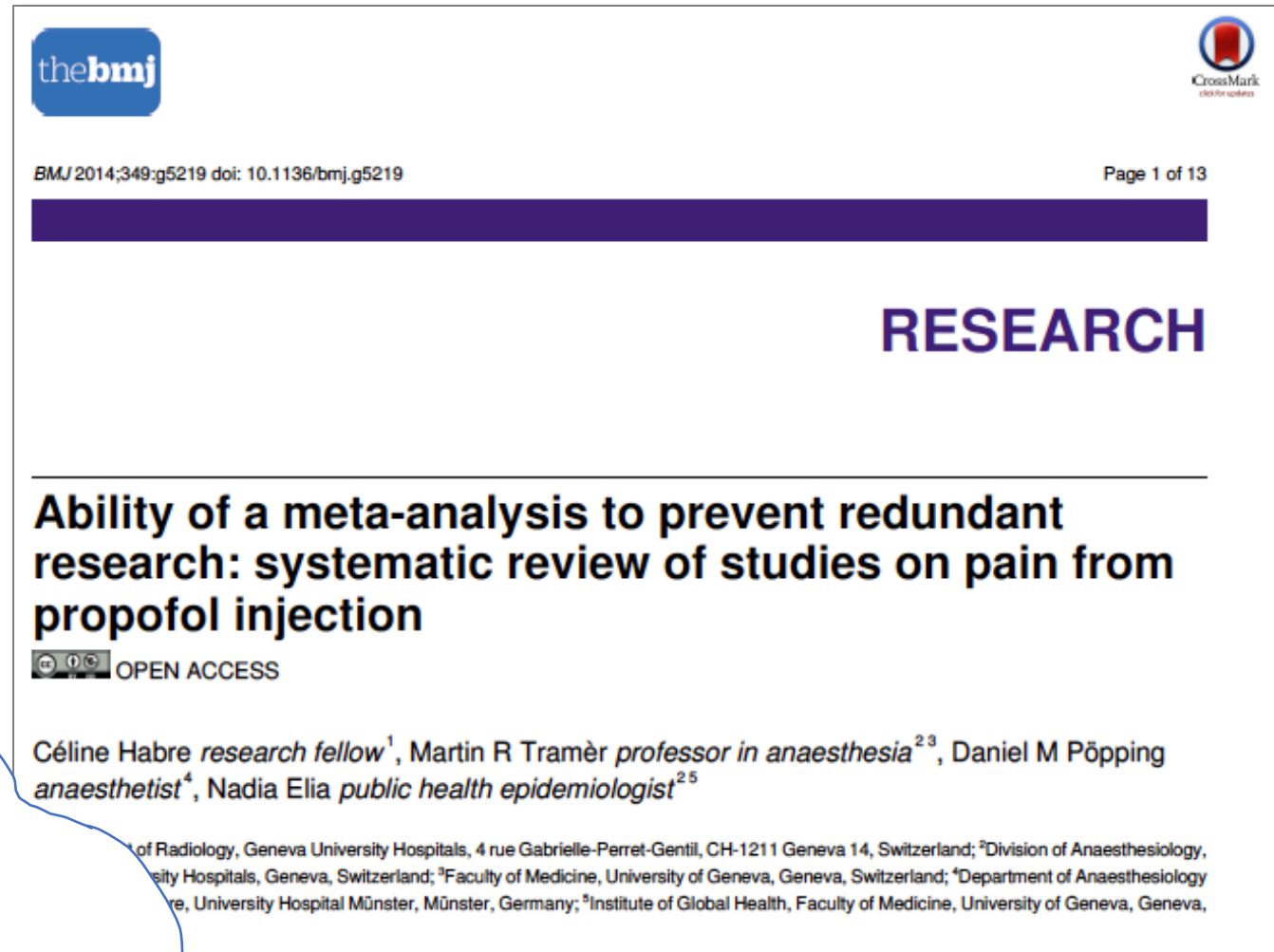
However, the author did not mention or used the systematic review in any other way.

For example, to stop the author from performing the study!

Then ...

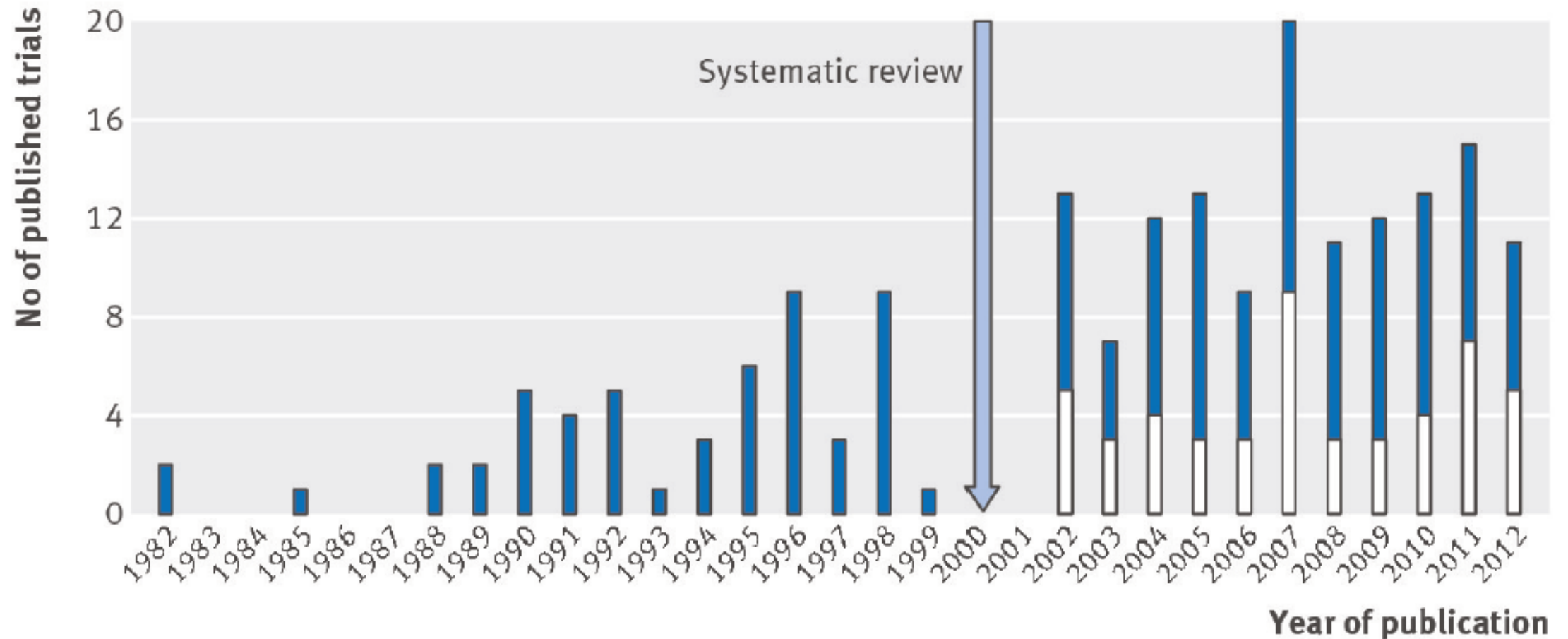
... in 2014, Celine Habré with one of the systematic review authors (Martin Tramér) and two more, published an updated systematic review:

“Ability of a meta-analysis to prevent redundant research: systematic review of studies on pain from propofol injection”



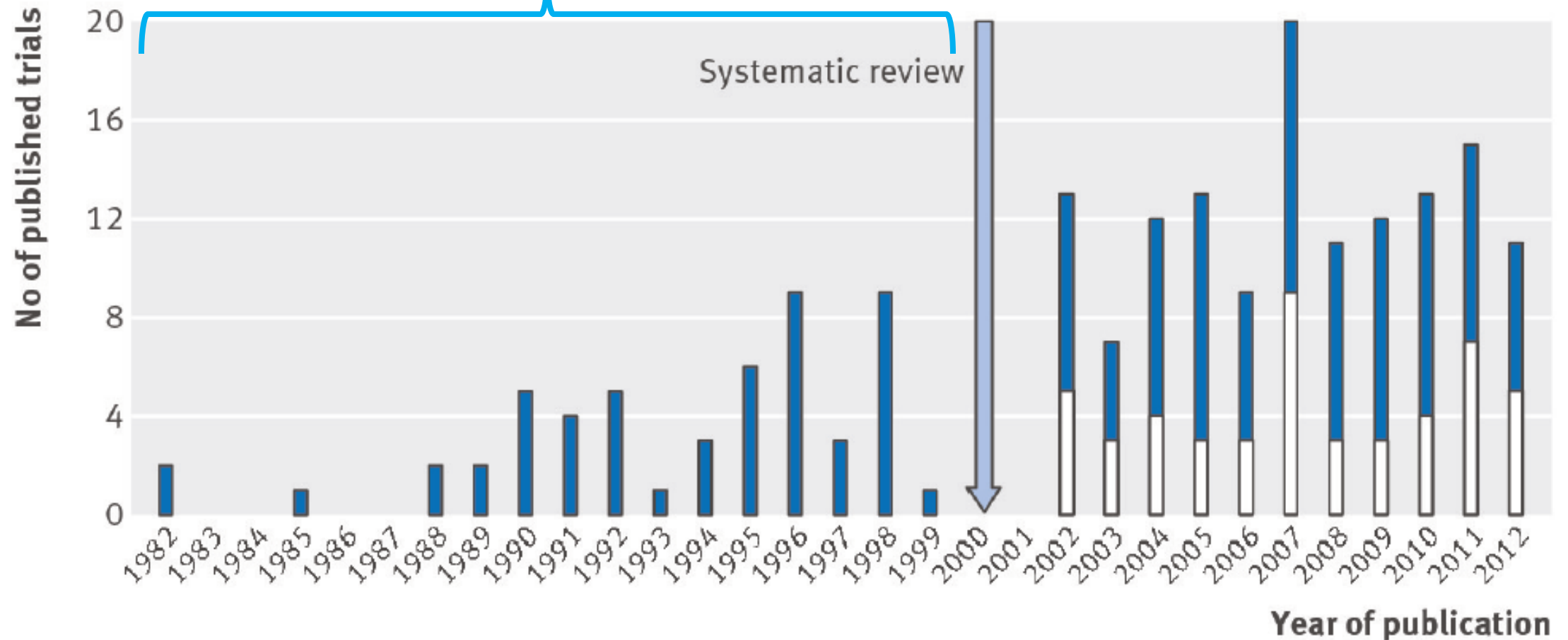
Céline Habre
Hôpitaux Universitaires de
Genève | HUG · Service de
radiologie

Habre et al. 2014

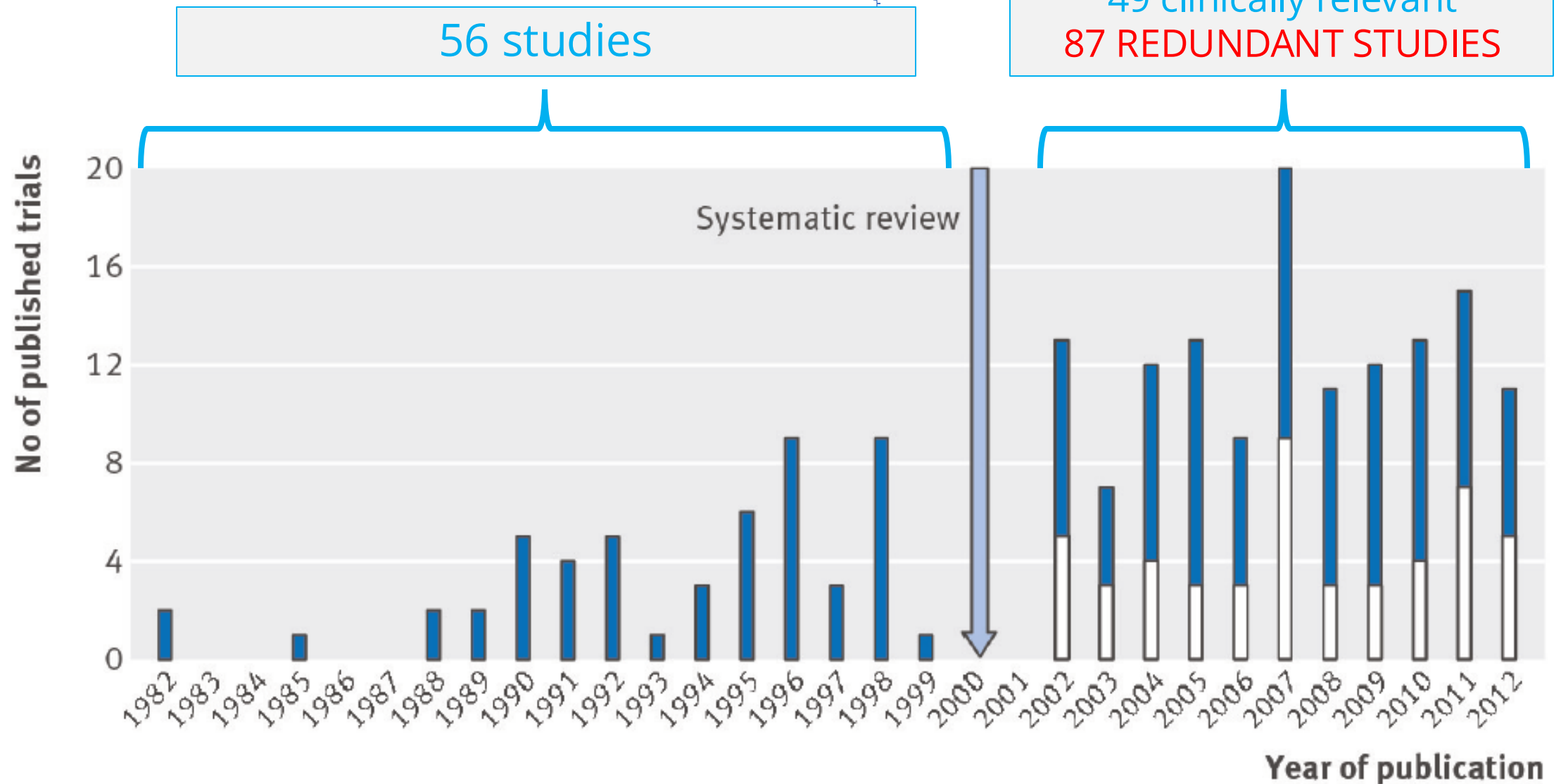


Habre et al. 2014

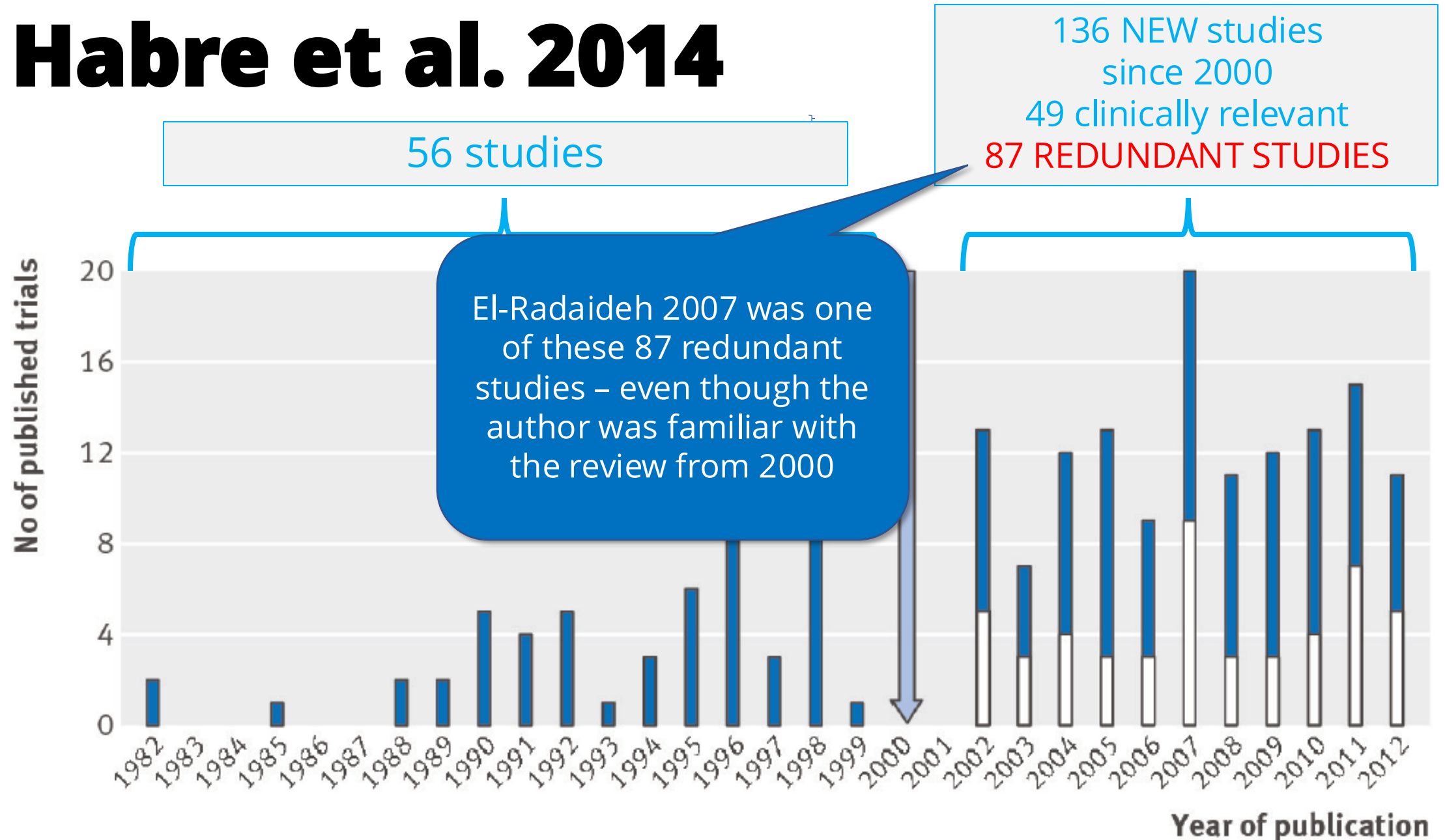
56 studies
(Picard & Tramér 2000)



Habre et al. 2014



Habre et al. 2014



Habre et al. 2014

This study [systematic review], illustrates four major problems:

- 1) Additional trials on this specific issue were no longer necessary
- 2) Publication of trials has nevertheless increased since systematic review in 2000
- 3) Although the systematic review provided a clear research agenda, its influence on the design of further trials has remained poor.
- 4) Citing the systematic review had no clear influence on the design or relevance of subsequently published research

Research should be **VALUABLE**

By valuable we mean:

1. **Scientifically valid:**

Does our research question answer a research gap, i.e., does it contribute with necessary knowledge?

2. **Societal relevant:**

Do our research meets the needs of the end users of the research project

Research should be VALUABLE

This can be
done by ...

By valuable we mean:

1. Scientifically valid:

Does our research question answer a research gap, i.e., does it contribute with necessary knowledge?

A SYSTEMATIC REVIEW OF EARLIER SIMILAR STUDIES

2. Societal relevant:

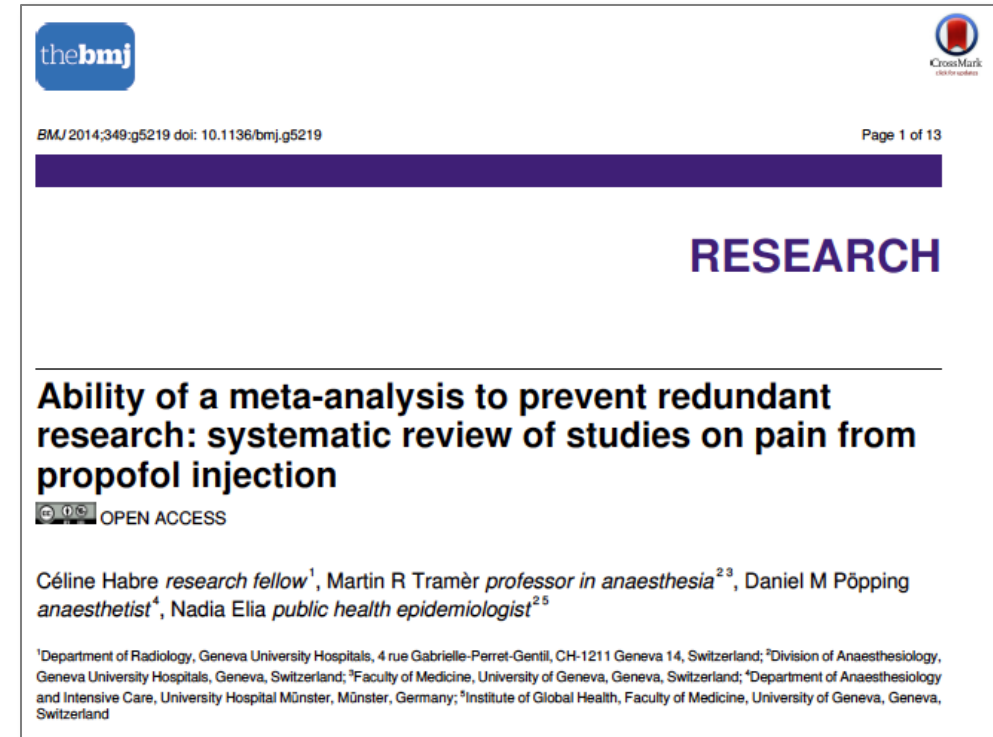
Does our research meet the needs of the end users of the research project

A SYSTEMATIC REVIEW OF QUALITATIVE STUDIES INCLUDING THE END USERS

Habre 2014

“There are numerous examples where systematic reviews, if performed in a timely manner, could have provided evidence of the effectiveness of an intervention and thus prevented redundant research.

There is also evidence that knowledge from systematic reviews are underused to inform future research.”



The approach to deal with this problem is called:

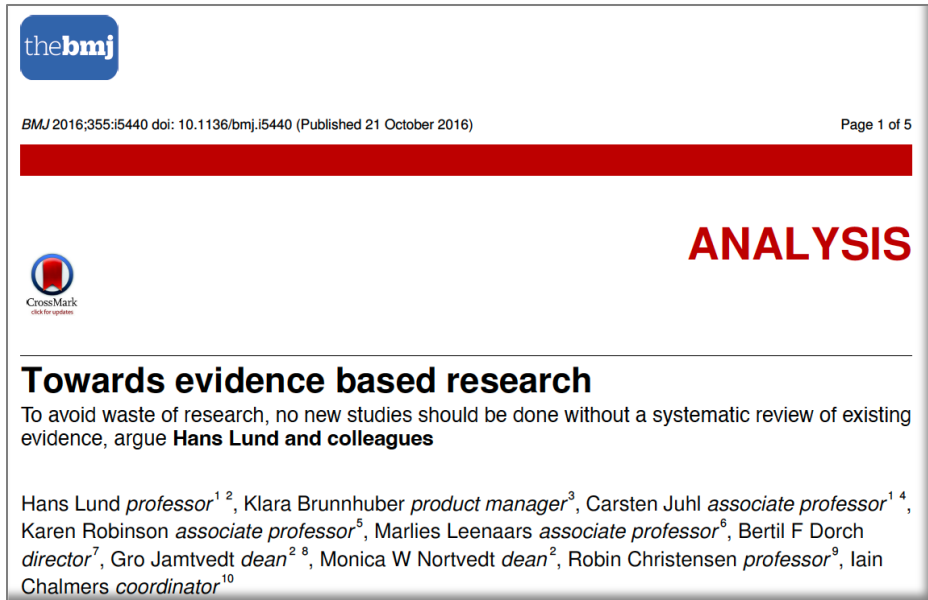
Evidence-Based Research (EBR)

Just like clinicians must use a systematic and transparent approach when making decisions,
so must researchers!



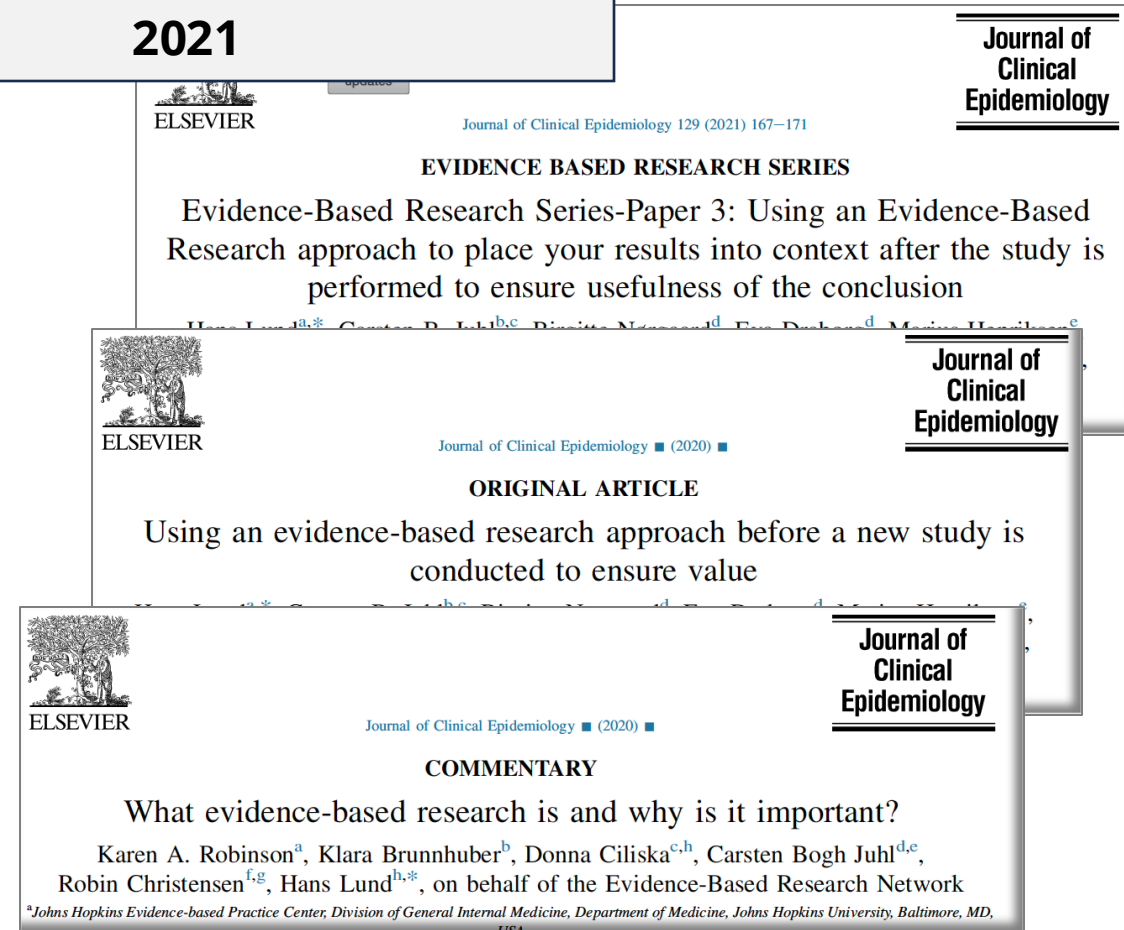
**The Evidence-Based
Research Network**

Introducing the EBR concept



Introducing the concept Evidence-Based Research 2016

Introducing how to practice Evidence-Based Research 2021



A Scoping Review 2022

... mapping all the meta-research studies evaluating this problem of redundancy.

Conclusion:

- Lack of information about possible redundancy in most health domains and research topics
- Indication of a **high prevalence of redundancy** and a **low prevalence of trying to minimise** or avoid redundancy
- 1 study evaluated whether end users' perspectives was used to inform justification and design new studies

Lund et al. *Systematic Reviews* (2022) 11:241
<https://doi.org/10.1186/s13643-022-02096-y>

Systematic Reviews

RESEARCH

Open Access

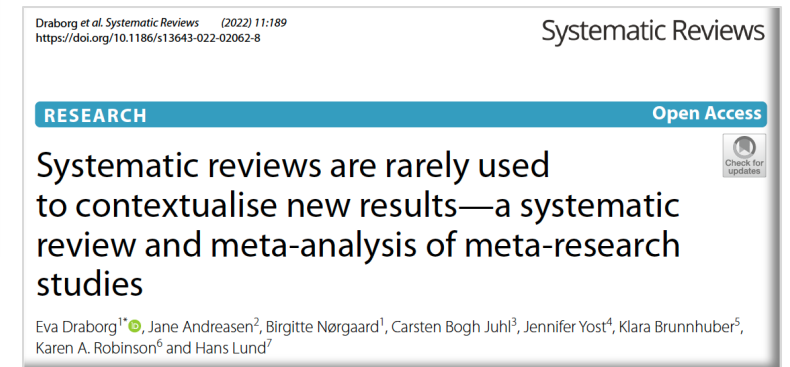
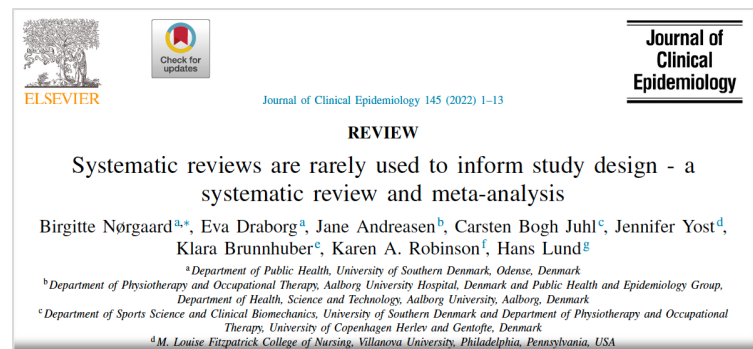


Meta-research evaluating redundancy and use of systematic reviews when planning new studies in health research: a scoping review

Hans Lund^{1*} , Karen A. Robinson^{1,2} , Ane Gjerland¹ , Hanna Nykvist¹ , Thea Marie Drachen³ , Robin Christensen^{4,5} , Carsten Bogh Juhl^{6,7} , Gro Jamtvedt⁸ , Monica Nortvedt⁹ , Merete Bjerrum^{10,11,12} , Matt Westmore¹³ , Jennifer Yost¹⁴ , Klara Brunnhuber¹⁵ and on behalf of the Evidence-Based Research Network

The scoping review ...

... initiated three systematic reviews related to how to minimize redundancy and unnecessary studies:



The overall evidence: when **justifying** a study - 2022

“The mean percentage of original studies using systematic reviews to justify their study was **42%** (95% CI: 36% to 48%).”

In other words:
58% were not using SRs to justify their study

PLOS ONE

RESEARCH ARTICLE

Justification of research using systematic reviews continues to be inconsistent in clinical health science—A systematic review and meta-analysis of meta-research studies

Jane Andreasen^{1*}, Birgitte Nørgaard², Eva Draborg³, Carsten Bogh Juhl³, Jennifer Yost⁴, Klara Brunnhuber⁵, Karen A. Robinson⁶, Hans Lund⁶

1 Department of Physiotherapy and Occupational Therapy, Aalborg University Hospital, Denmark and Public Health and Epidemiology Group, Department of Health, Science and Technology, Aalborg University, Aalborg, Denmark, **2** Department of Public Health, University of Southern Denmark Odense, Denmark, **3** Department of Sports Science and Clinical Biomechanics, University of Southern Denmark and Department of Physiotherapy and Occupational Therapy, Copenhagen University Hospital, Herlev and Gentofte, Herlev, Denmark, **4** M. Louise Fitzpatrick College of Nursing, Villanova University, Villanova, PA,

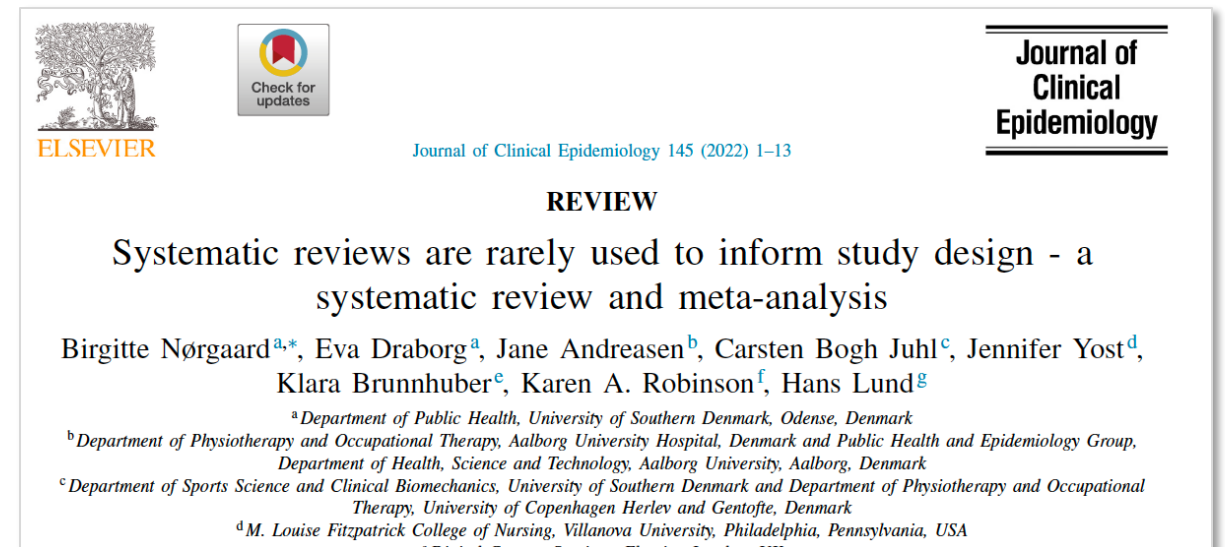


The overall evidence: when **designing** a new study - 2022

The mean percentage of original studies using systematic reviews to inform the design was **17%** (95% CI: 6% to 33%).”

In other words:

83% were not using SRs to inform their design of their new study



The overall evidence: when placing new results **in context** of existing evidence - 2022

The mean percentage of
original studies using
systematic reviews to place
new results in context was
31%
(95% CI: 24% to 38%).”

In other words:
69% were not using SRs to
inform their design of their
new study

Draborg et al. *Systematic Reviews* (2022) 11:189
<https://doi.org/10.1186/s13643-022-02062-8>

Systematic Reviews

RESEARCH

Open Access



Systematic reviews are rarely used
to contextualise new results—a systematic
review and meta-analysis of meta-research
studies

Eva Draborg^{1*}, Jane Andreasen², Birgitte Nørgaard¹, Carsten Bogh Juhl³, Jennifer Yost⁴, Klara Brunnhuber⁵,
Karen A. Robinson⁶ and Hans Lund⁷

How to deal with that?

An international network



**The Evidence-Based
Research Network**

If you like to know more go to:

ebrnetwork.org

5th Evidence-Based Research Conference

Bergen, Norway 19.-21. November 2025



<https://www.hvl.no/en/research/conference/5th-ebr-conference/>

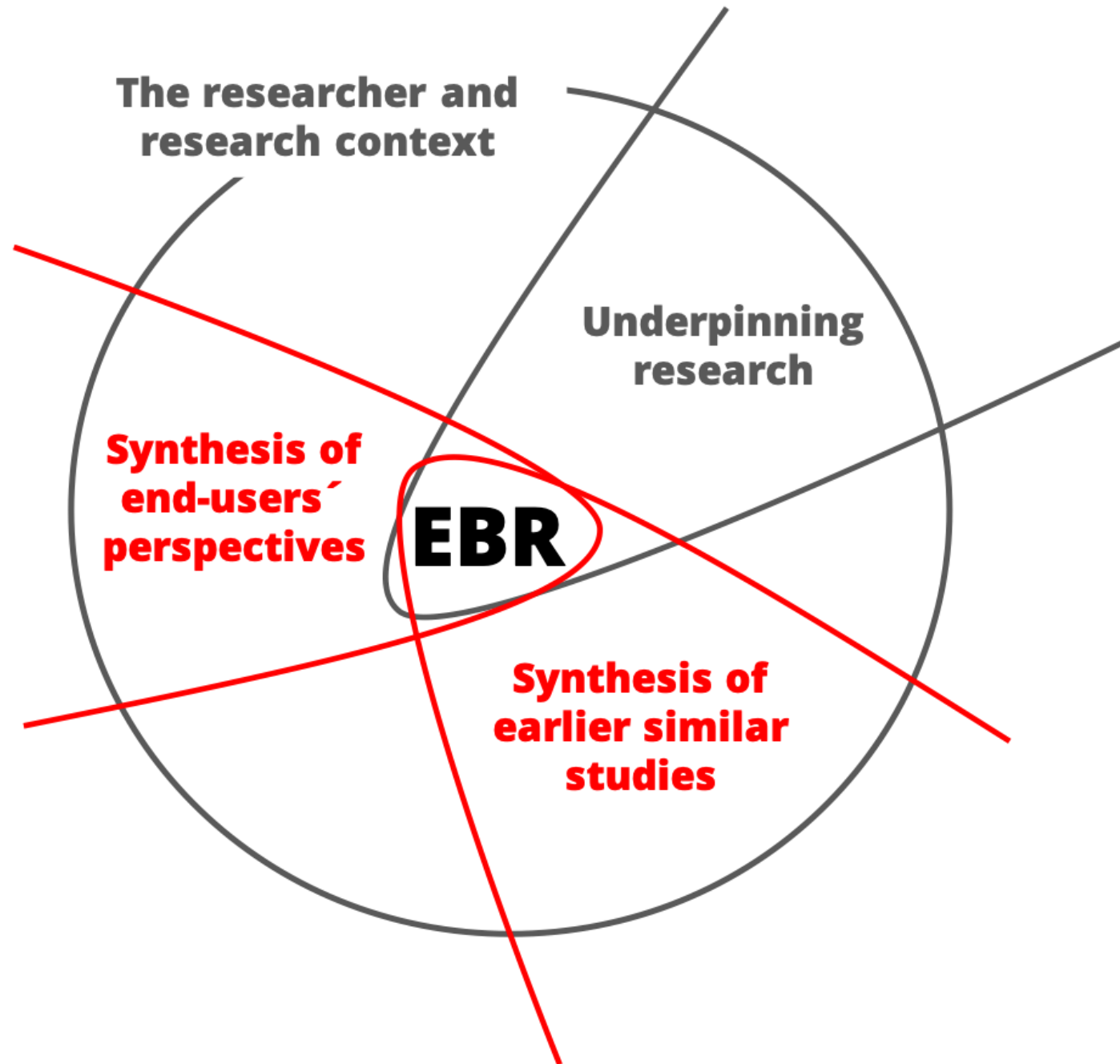
The EBRNetwork define EBR

EBR is the use of prior research in a systematic and transparent way to inform a new study so that it is answering questions that matter in a valid, efficient, and accessible manner

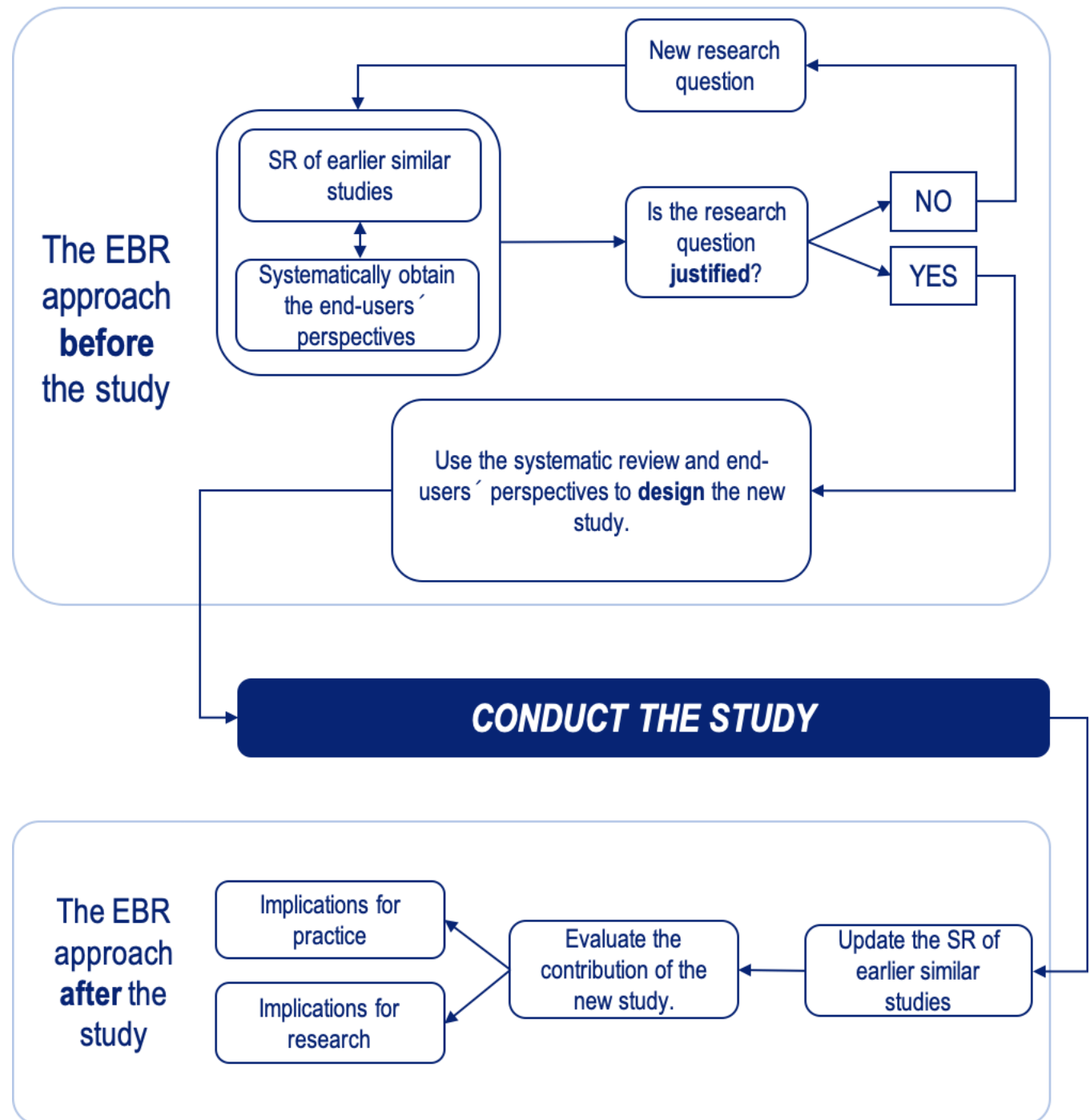


**The Evidence-Based
Research Network**

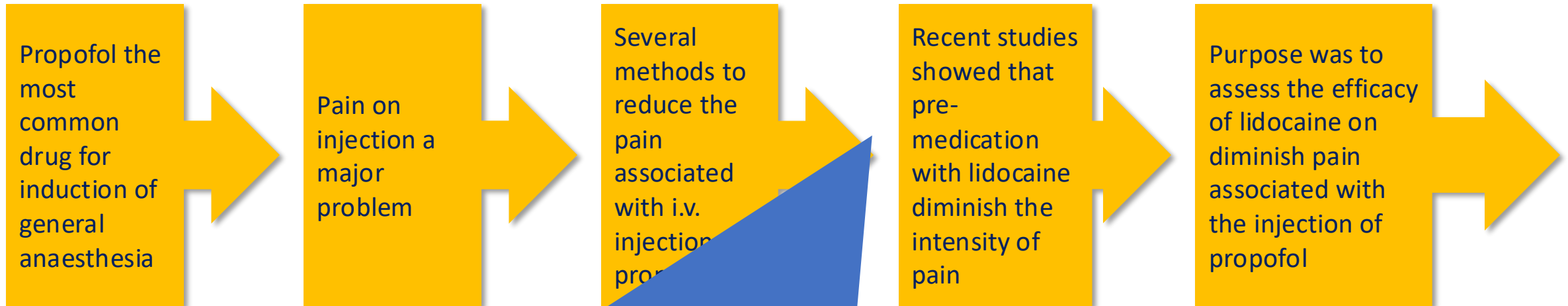
The elements of an EBR approach



The EBR approach



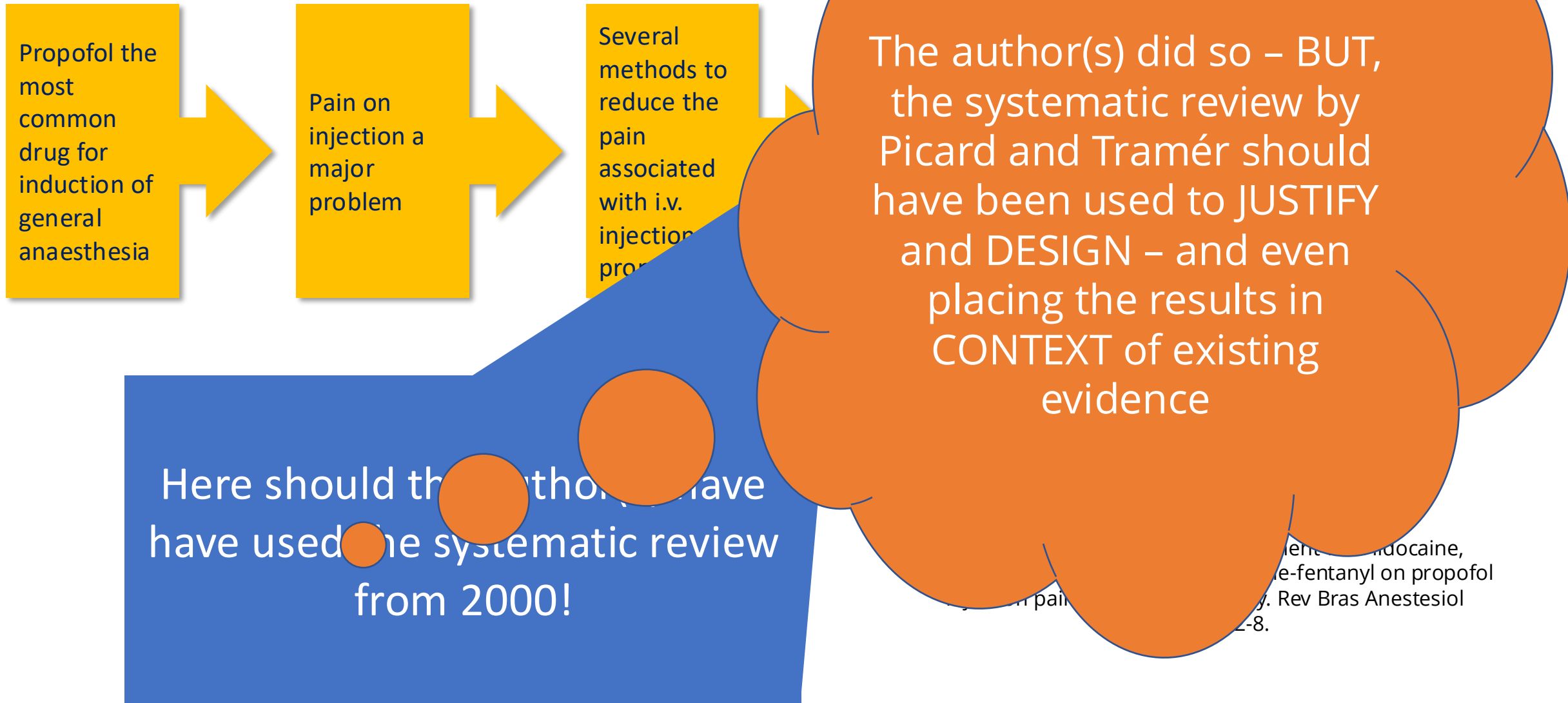
An example: Chain of arguments in the Background



Here should the author(s) have used the systematic review from 2000!

From
El-Radaideh KM. Effect of pretreatment with lidocaine, intravenous paracetamol and lidocaine-fentanyl on propofol injection pain. Comparative study. Rev Bras Anesthesiol 2007;57:32-8.

An example: Chain of arguments in the literature



For you to consider if aiming for doing valuable research

“How did I justified my latest study or my PhD project?”

“Did I used a systematic and transparent approach when

- I considered existing evidence
- I considered the end users’ perspectives
- I prepare the design of my new study
- I tried to place my new results in the context of existing evidence”



“If I used a systematic and transparent approach how did I reported it?”

Thank you for your attention



**The Evidence-Based
Research Network**

If you like to know more go to:
ebrnetwork.org

References

1. El-Radaideh KM. [Effect of pretreatment with lidocaine, intravenous paracetamol and lidocaine-fentanyl on propofol injection pain. Comparative study. Rev Bras Anesthesiol. 2007;57(1):32-8.
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3. Habre C, Tramer MR, Popping DM, Elia N. Ability of a meta-analysis to prevent redundant research: systematic review of studies on pain from propofol injection. BMJ. 2014;348:g5219.
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