



JOHNS HOPKINS

BLOOMBERG SCHOOL
of PUBLIC HEALTH

Introduction to Systematic Reviews

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Key Messages

- Systematic review uses explicit methods to identify, select, appraise, and synthesize results from similar but separate studies
- Meta-analysis, the statistical analysis of a large collection of results from individual studies is an optional component of a systematic review
- The *Cochrane Library*
 - ▶ Main product of the Cochrane Collaboration
 - ▶ Single best place to find independent, high-quality evidence for health care decision making



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Section A

Introduction to Systematic Reviews

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Information about Health Care Is Everywhere

- But how do you know if one health care intervention works better than another
- Or if it will do more harm than good?

Typical Clinical Questions

- Are antioxidant supplements effective for preventing mortality in healthy participants?
- Do annual general health checks (annual physical exams) reduce illness and mortality?
- Is an “early” epidural as effective and safe as a “late” epidural for women in labor?

Too Much Information



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Too Much Information



Too Much Information



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The Science News Cycle

THE SCIENCE NEWS CYCLE

JORGE CHAM © 2009



Timing of Epidural



THE COCHRANE LIBRARY

Independent high-quality evidence for health care decision making

Timing of epidural is up to the mother

When a woman is in labor, the appropriate time to give an epidural during childbirth is when she asks for it, a new study suggests ...

The Cochrane researchers reviewed data from nine studies involving 15,752 first-time mothers who were randomly assigned to “early” or “late” groups ... **When the results were analyzed, those who had early epidurals were no more or less likely to need a Caesarean section than those who had late epidurals. Earlier epidurals made no difference to the likelihood of needing an assisted birth involving forceps or suction, or to the amount of time spent in the second, “pushing” stage of labor.**

Annual Physical

Skip Your Annual Physical

JAN. 8, 2015

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FAR FROM THE MADDING CROWD

WE all make resolutions and promises to live healthier and better lives, to make the world a better place. Not having my annual physical is one small way I can help reduce health care costs — and save myself time, worry and a worthless exam.

Around 45 million Americans are likely to have a routine physical this year — just as they have for many years running. A poke here, a listen there, a few tubes of blood, maybe an X-ray, a few reassuring words about diet, exercise and not smoking from the doctor, all just to be sure everything is in good working order. Most think of it as the human equivalent of a 15,000-mile checkup and fluid change, which can uncover hidden problems and ensure longer engine life.

There is only one problem: From a health perspective, the annual physical exam is basically worthless.

In 2012, the Cochrane Collaboration, an international group of medical researchers who systematically review the world's biomedical research, analyzed 14 randomized controlled trials with over 182,000 people followed for a median of nine years that sought to evaluate the benefits of routine, general health checkups — that is, visits to the physician for general health and not prompted by any particular symptom or complaint.

The unequivocal conclusion: the appointments are



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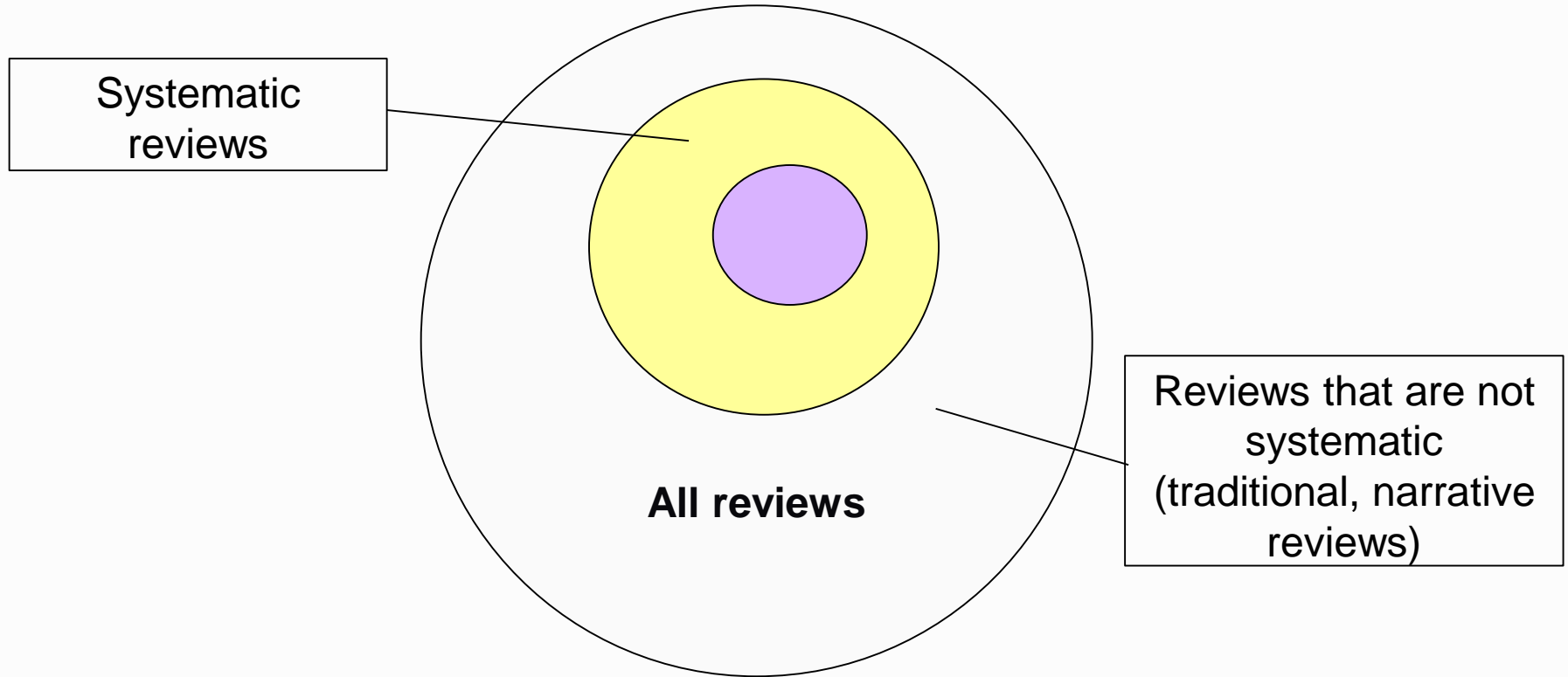
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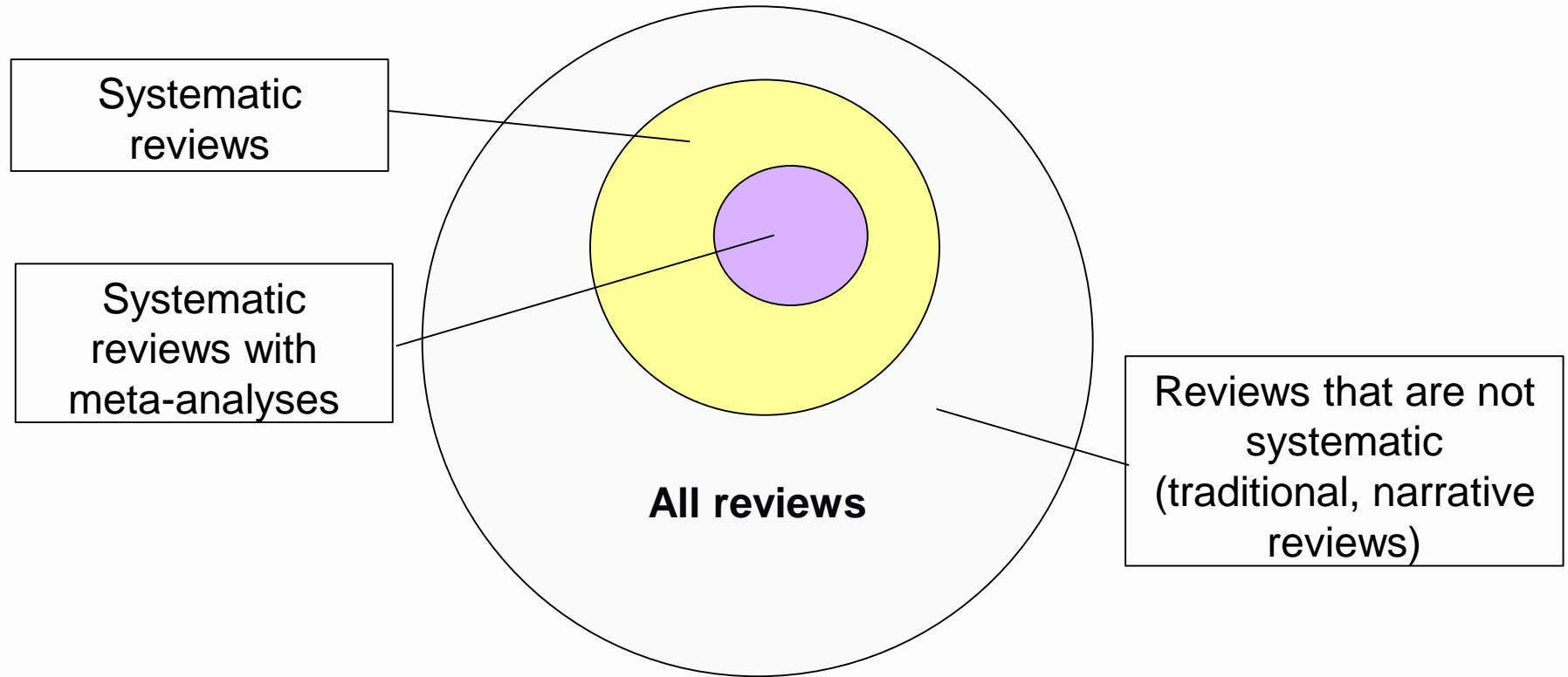
What Is a Systematic Review?

- Focuses on a specific question
- Uses explicit, pre-planned scientific methods to *identify, select, appraise, and summarize* similar but separate studies

What Is a Systematic Review?



What Is a Systematic Review?



“Traditional” Narrative Reviews

- No standard format
- No clearly specified methods of identifying, selecting, and validating included information
- Quantitative synthesis rarely used to integrate the information from multiple studies

Methods Used in Medical and Epidemiology Review Articles

Review methodology	Medical 1985-6 (n=50)	Medical 1996 (n=158)	Epidemiology 1997-9 (n=39)	Meta-analysis 1996 (n=19)
Addressed a focused question	80%	34%	49%	95%
Described methods for locating evidence	2%	38%	15%	95%
Used explicit criteria to select studies	2%	14%	10%	95%

How Do You Do a Systematic Review?

- Step 1: gather together your team
- Step 2: develop your protocol
- Step 3: data collection: locate, screen, and collect studies
- Step 4: abstract data and appraise risk of bias in the individual studies
- Step 5: synthesize findings, interpret, and assess overall body of evidence
- Step 6: write report
- Step 7: update

Systematic Reviews Summarize the Evidence

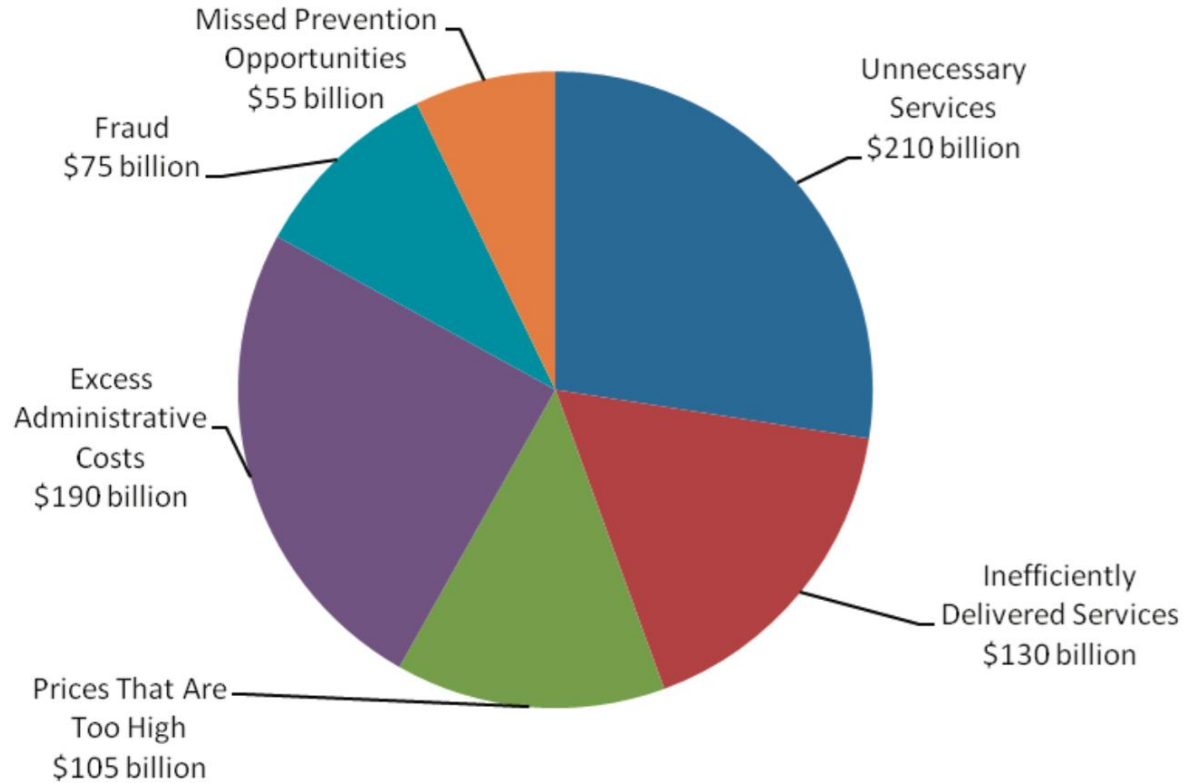
- Evidence-based health care
- Evidence-based medicine
- Evidence-based public health
- Evidence-based policy
- Evidence-based [fill in the blank]

Evidence-Based Health Care

The integration of best research evidence with clinical expertise and patient values.

—Sackett, 2000

Health Care Overspending in the United States



From the IOM's analysis of its own 2010 data. You can see there are a whole bunch of sources for unnecessary spending that range from inefficient services to excess services and administrative costs.

Definition of *Comparative Effectiveness Research (CER)*

- **CER** is the generation and synthesis of evidence that compares the benefits and harms of alternative methods to prevent, diagnose, treat, and monitor a clinical condition or to improve the delivery of care
- The purpose of CER is to assist consumers, clinicians, purchasers, and policy makers to make informed decisions that will improve health care at both the individual and population levels



← → ↻ www.pcori.org

pcori Patient-Centered Outcomes Research Institute

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Important Questions, Meaningful Answers

See how the studies we fund can help patients, clinicians, and others make better-informed health decisions

MORE DETAILS



Learn who we are and what we do



Find out what we're funding and how to apply



What does PCORI-funded research look like?

NEWS&ANALYSIS

NEWSMAKER INTERVIEW: JOE SELBY

Sifting Medical Records to Determine Which Therapies Work Best

an almost open agenda. Its task is mind-bogglingly broad, though: to discover what kinds of therapies work best for patients.

Selby, 64, a family physician and epidemiologist, has been on the job as PCORI's first executive director for only 3 months. He was recruited from Kaiser Permanente of Northern California, where he spent 27 years as a doctor-investigator and then head of research. His main interest in recent years has been type 2 diabetes, and he led studies that helped establish the value of the drug metformin to prevent or slow the disease. Early use of metformin is accepted everywhere now, Selby says, but it took a decade of research to prove that it was safer and more effective than the sulfonylurea drugs used for more than 3 decades—and to persuade doctors to switch.

PCORI was created by the 2010 Patient Protection and Affordable Care Act. But

—ELIOT MARSHALL



Q: How will stakeholders set the agenda?

J.S.: Over the next 2 to 3 months we will be going out to patient organizations, convening meetings of patients, conducting focus groups. We will very likely be using some

that they have experience in doing that. And patients will be among the members of the study sections. I can't tell you the exact number per study section, but it will be more than a token patient. We will take patients through training to get them ready to participate.

Q: Will PCORI studies look at cost?

J.S.: We are funded and have a mandate to measure clinical outcomes. One thing we very clearly won't do is do cost-effectiveness studies. It is very clear that the framers of the legislation do not want us to go near that.

Q: Who will conduct this research?

J.S.: PCORI hopes to fund a broader spectrum of researchers; it hopes to pull new players who are close to patients, close to communities, closer to usual care. We have to do this while preserving the rigor of research. One way that could happen is by fostering centers

NEWS&ANALYSIS

NEWSMAKER INTERVIEW: JOE SELBY

Q: What is the main goal of this research?

J.S.: We think it starts by listening to the patients, that the research agenda is driven by what patients say is important. Patient-centered—outcomes research is putting useful, practical information in the hands of patients and their clinicians.

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