Introduction to Systematic Reviews

What is a systematic review?

Medical research can take many forms. For example, you might be familiar with randomized controlled trials (RCTs), which are used to test new medications and vaccines, among other things. RCTs are usually designed to answer a very specific question but sometimes they seem inconsistent – one trial may say that medication A improves your health a lot while another says that medication A does not have any effect on your health. Sometimes it can also be tricky to know how to make medical decisions for every patient based on the results of one study, which may include patients with different levels of disease or other factors. This is where systematic reviews come in.

A systematic review is a "study of studies", a way to summarize what existing research says about a given topic. It can examine all of the evidence on a treatment, if it works, if some treatments are more effective than others, and whether treatments work differently for different people. Because a systematic review summarizes all relevant studies, it can be one of the strongest forms of evidence in medicine. Organizations use systematic reviews when writing medical guidelines and researchers use them to explore gaps in our knowledge that should be studied.

Researchers follow a rigorous process when conducting a systematic review. They start with a research question or questions they want to answer. Using the question(s) as a guide, researchers create a protocol, a set of rules to define how they will search for relevant studies, which studies should be included or excluded from the systematic review (see the table below), and how selected studies will be examined. It is important to get the questions right. For example: are we asking about the right people? Have we considered the right treatments? Which outcomes are important? People with a wide variety of perspectives, through both personal experience and professional expertise, can help us understand the nuances of a topic so we can better understand and evaluate the research.

Key questions

Key questions are the main questions that a systematic review is designed to answer. Every key question is written using the PICOTS framework. This means that every question must include a Population, Intervention, Comparator, Outcome, Timing, and Setting.

Sample question: Among adults with high blood pressure, does self-measured blood pressure (SMBP) monitoring, compared with other interventions without SMBP, have an effect on health outcomes?

Parameter	Example
P*opulation* – who are we asking the question about? What age, gender, race, or medical conditions define them?	Adults with high blood pressure (exclude individuals with pregnancy-related hypertension)
I*ntervention* – which treatment(s) are we interested in?	Self-measured blood pressure (i.e. a blood pressure cuff at home)
C*omparator* – what are we comparing our intervention to?	Meditation training, low-sodium diet, blood pressure medications, usual care

***O**utcomes* – which outcomes do we want to look at?	Change in blood pressure, self-reported health (does the patient feel healthier?), energy levels, side effects, number of sick days at work
***T**iming* – how long should included studies follow-up with patients?	Only include studies where researchers followed up with patients for at least 3 months.
***S**etting* – should the review be limited to certain care delivery locations?	Studies in the outpatient, home, and community settings. Exclude in-hospital studies.

Contextual questions

Sometimes systematic reviews include contextual questions to address other aspects of the topic. More details about contextual questions will be provided during the webinar.

Examples of systematic review reports

One systematic review that PCORI previously commissioned through the Agency for Healthcare Research and Quality (AHRQ) looked at the effectiveness of psychological and pharmacological treatments for Post-traumatic Stress Disorder (PTSD). You can see the results of that study in two formats using the links below.

PTSD: Formal systematic review report

PTSD: PCORI summary for patients and caregivers

Why we need you

A systematic review is a powerful tool. Patients and physicians can use them to consider treatment options, healthcare plans can use them to inform decision making, and researchers can use them when deciding what to study next. But a systematic review is only helpful if we ask questions that are useful to patients, caregivers, clinicians, and decision makers. That is where you come in. As someone with personal or professional experience in this area, we want to talk to you to make sure we are asking the right questions.

Here are examples of questions we might ask you:

- Do any of these questions need to be asked differently?
- What changes, if any, need to be made to the PICOTS?
- Are there any other questions that you think are important to include?

We will send out a list of actual discussion questions before the webinar and your feedback will be considered as we finalize the protocol for this systematic review. After the systematic review is complete, we will notify you so you can review the results.

More Research Fundamentals

If you are interested in learning more about how diverse stakeholder groups can contribute to research, check out PCORI's Research Fundamentals. This free, on-demand virtual training offers different ways to learn about the health research process and be involved in patient-centered outcomes research.