Nutrition Evidence Systematic Review: Overview of Methodology

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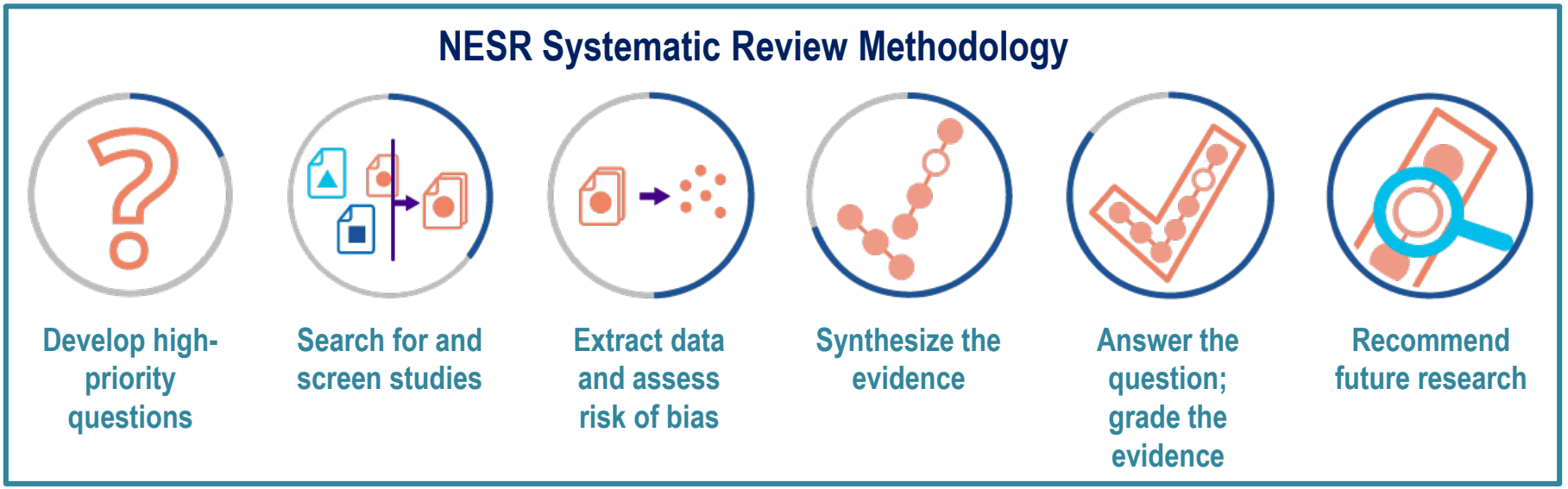
NESR conducts food- and nutrition-related systematic reviews

- NESR systematic reviews are research projects that answer a clearly formulated scientific question by searching for, evaluating, analyzing, and synthesizing nutrition evidence.

- NESR methodology is rigorous, transparent, and aligned with best practices



NESR is supporting the 2020 Advisory Committee in conducting systematic reviews

The 2020 Advisory Committee:

- Establishes all aspects of the protocol (i.e., the plan for how it will examine the scientific evidence), including the inclusion and exclusion criteria;
- Reviews all studies that meet the criteria they set;
- Deliberates on the body of evidence for each question, and
- Writes and grades the conclusion statements to be included in the scientific report the 2020 Committee will submit to USDA and HHS.

NESR Staff: Support the Advisory Committee by facilitating, executing, and documenting the work necessary to ensure the reviews are done in accordance with NESR methodology.

NESR is a team of scientists who have expertise in systematic review methodology

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Marlana Bates MPH, RD

Emily Callahan, MS

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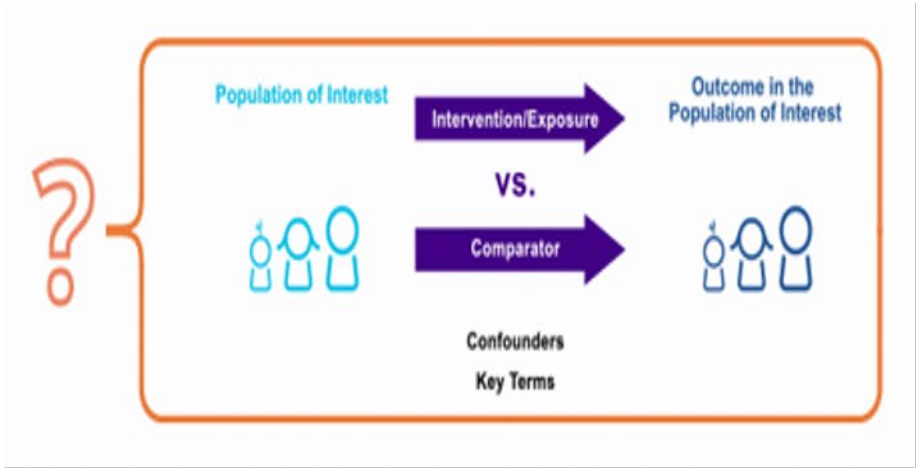
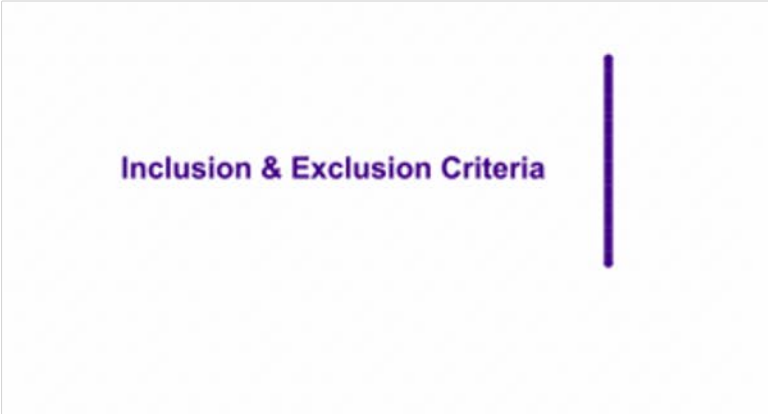
Gisela Butera, MLIS, MEd

Nancy Terry, MLS

The Advisory Committee develops a protocol for each systematic review question





A systematic review protocol is the plan for how a specific systematic review will be conducted and includes:

- Analytic framework
- Inclusion and exclusion criteria
- Search strategy
- Flow chart of literature search and screening results
- Lists of included and excluded articles

A literature search is conducted to find ***all*** relevant studies

- NESR librarians create a search strategy (electronic databases, key search terms) to find all studies that are relevant to the systematic review question.
- The search strategy is reviewed by the Committee and peer-reviewed by another librarian.
- The librarians conduct the search, which yields a list of potentially relevant studies.

Studies are screened using the inclusion and exclusion criteria

- Two NESR analysts independently screen all studies identified in the search using the inclusion and exclusion criteria. Studies that meet *all* of the criteria are included in the systematic review.
- Manual search is conducted to find articles that meet all criteria, but were not identified through the electronic database search.
- NESR analysts document the studies that are included, and those that are excluded and why.

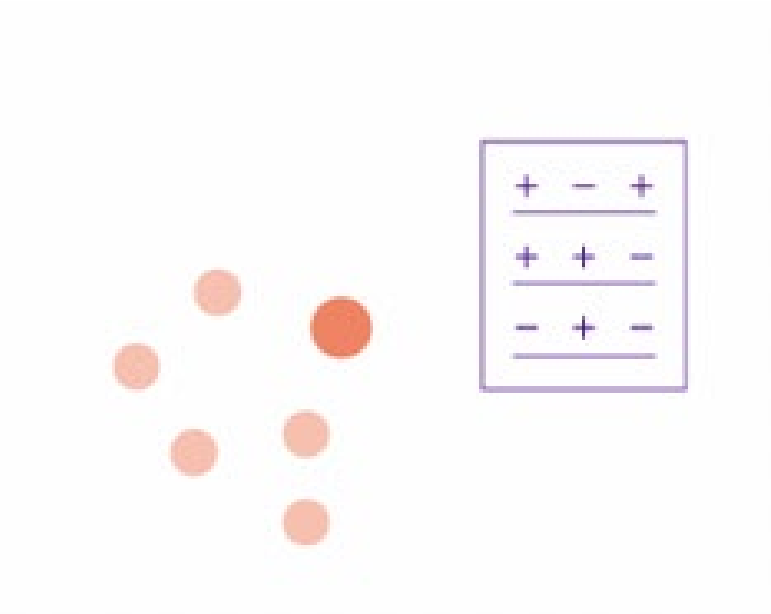
Data are extracted from each included study

NESR analysts extract data for each included study that will be used to answer the systematic review question.

- Study design
- Participant characteristics
- Measurement methods
- Analysis
- Results
- Funding source

A risk of bias tool is used to assess each included study

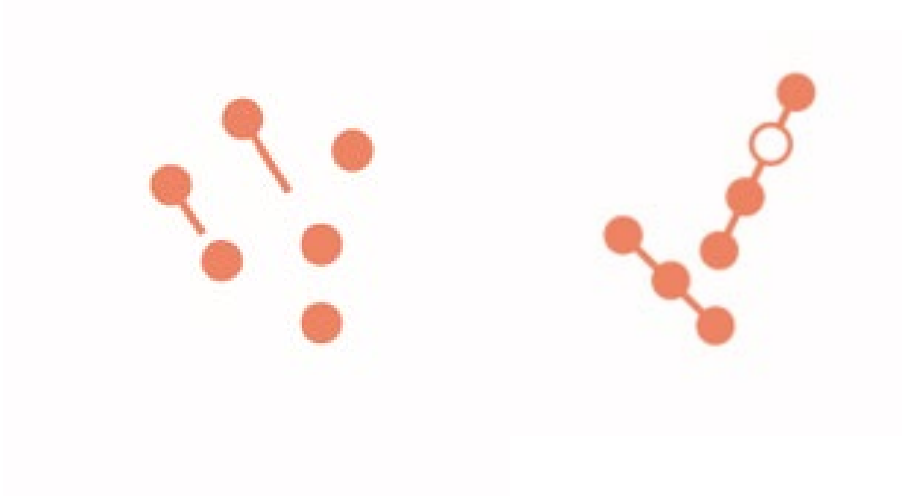
Risk of bias is the likelihood of a systematic error or deviation from the truth in results. Biases can lead to underestimation or overestimation of the true effect of an intervention/exposure on an outcome. *(Cochrane Handbook, 2019)*



- Randomization
- Selection of participants
- Confounding
- Classification of interventions or exposures
- Deviations from intended interventions or exposures
- Missing data
- Outcome measurement
- Selection of the reported result

Visit NESR.usda.gov for more information about the risk of bias tools being used ("Cochrane risk-of-bias tool for randomized trials" (RoB 2.0); "Risk of Bias in Non-randomized Studies-of-Interventions" tool (ROBINS-I); "Risk of Bias for Nutrition Observational Studies" tool (RoB-NObs))

The evidence from all included studies is synthesized



Evidence synthesis is the process by which evidence from multiple studies is described, compared and contrasted, and combined, qualitatively, by:

- Identifying overarching themes or key concepts from the findings
- Identifying and explaining similarities and differences between studies
- Determining whether certain factors impact the relationships being examined

The Advisory Committee develops a conclusion statement to answer the systematic review question

- The Committee develops a conclusion statement, which is a summary statement that reflects the complete body of evidence reviewed, and is written as the answer to the systematic review question.

- A conclusion statement may also state that there is not enough evidence to answer the question.

The Advisory Committee grades the strength of the evidence

The Committee uses predetermined criteria to assign one of four grades to indicate the strength of the body of evidence supporting a specific conclusion statement:

- Strong
- Moderate
- Limited
- Grade not assignable

Predetermined criteria are used to assess the body of evidence

- **Risk of Bias:** likelihood that systematic errors resulting from the design and conduct of the studies could have impacted the accuracy of the reported results
- **Consistency:** degree of similarity in the direction and magnitude of effect, and whether any inconsistency can be explained by differences in study designs and methods.
- **Directness:** how well the primary research studies are designed to address the systematic review question.
- **Precision:** degree of certainty around an effect estimate for a given outcome, including sample size, number of studies, and variability within and across studies.
- **Generalizability:** whether the study participants, interventions and/or exposures, comparators, and outcomes examined are applicable to the U.S. population.

*** Study design is also considered by examining these elements for each category of study design separately**

The Advisory Committee recommends future research

Research recommendations are identified to address gaps and limitations in the evidence.

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