Philosophical considerations when aggregating findings

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The Systematic Review:

- Findings of a traditional literature review may be open to bias and subjectivity

The systematic review:

- … 'is an attempt to minimise the element of arbitrariness … by making explicit the review process, so that, in principle, another reviewer with access to the same resources could undertake the review and reach broadly the same conclusions'
  (Dixon et al., 1997:157 quoted by Seers, 2005:102).
- Most approaches seek to aggregate the findings of two or or more studies that a sufficiently similar (homogeneous) to combine or pool

Aggregative syntheses - conventional SR

- Starts with a tightly defined question
- Focus on summarising or pooling data
- Categories under which data are to be summarised are assumed to be secure and well-specified

The Systematic Review of Quantitative Evidence

- ‘a review that has been prepared using a systematic approach to minimising biases and random errors’

(Egger et al., 2001:5)

(Dixon et al., 1997:157 quoted by Seers, 2005:102)

- ‘the application of strategies that limit *bias* in the assembly, critical appraisal, and synthesis of all relevant studies on a specific topic’

(Porta, 2008:217).

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Bias

- ‘systematic deviation of results or inferences from truth’
- ‘an error in the conception and design of a study- or in the collection, analysis, interpretation, reporting, publication, or review of data-leading to results or conclusions that are systematically (as opposed to randomly) different from truth’

(Porta, 2008:18)

Meta-analysis

- Quantitative evidence
- use of statistical methods of combining the results of various independent, similar studies
- more precise calculation of one estimate of treatment effect than could be achieved by any of the individual, contributing studies
- only forms a part of the systematic review in which it appears

Points of contention

- Debate continues in relation to:
  - high vs low levels of evidence in quantitative fields for informing practice
  - the role of RCTs
  - The role of individualised data/ patient oriented outcomes
  - Etc etc

The Systematic Review of Qualitative Evidence

What do users want from reviews?

- Rigorous reviews that are potentially reproducible, though generally researchers are assumed to know their business
- Trustworthy, transparent methods
- Relevant, up-to-date answers to their questions in their context/population
- Accessible presentation of findings with clear messages
- Timeliness
- Information about risks (harms) as well as costs & benefits, preferably by population sub-groups
- Some indication of uncertainty associated with estimates

Lavis J, et al. Towards systematic reviews that inform health are management and policy making. JHSR&P 2005:10(suppl 1): 35-48

The SR Process

Quantitative Reviews	*Qualitative Reviews?*
• Question	□
• Inclusion Criteria	□
• Search Strategy	□
• Critical Appraisal	□
• Extraction	□
• Synthesis	□

The Review Question

Effects

- Population
- Intervention
- Comparison
- Outcome

Feasibility, Appropriateness, Meaningfulness

- Participants
- *Phenomenom of* Interest
- Context

See: Booth A. Using research in practice: Australian supermodel? A practical example of evidence-based library and information practice. Health Information and Libraries Journal 2006; 23: 69-72

For health services leaders and clinicians, the debates that surround qualitative SRs are:

- Not known; or
- Not understood; or
- Not relevant

The Debate...

- The synthesis or “pooling” of the findings of qualitative research studies is controversial.
- Contested by quantitative researchers because of the “subjective” nature of qualitative evidence.
- Contested by qualitative researchers, because of the ideological, philosophical and methodological differences that characterise the flexibility of the qualitative research tradition.
- Some qualitative researchers argue that the synthesis of qualitative studies is impossible and meaningless. Others support the notion of qualitative synthesis, but there is no emerging consensus on appropriate guidance for the systematic review of qualitative evidence for health and social care.

Integration /Aggregation versus Interpretation

- The two dominant, opposing views that characterise the ongoing debate surrounding the meta-synthesis of qualitative evidence focus on integration or aggregation versus interpretation.

Integration/aggregation

- Involves assembling the findings of studies (variously reported as themes, metaphors, categories etc) and pooling the findings through further aggregation based on similarity in meaning.
- Those who oppose this approach suggest that synthesis represents “new knowledge” and that aggregation is not synthesis.
- Integrative syntheses are those where the focus is on summarising data, and where the concepts (or variables) under which those data are to be summarised are assumed to be largely secure and well specified
- The kinds of results that integrative syntheses may be especially likely to produce will often be theories of causality, and may also include claims about generalisability

Interpretive Synthesis

- involves both induction and interpretation, and seeks ***not to predict*** but to ‘anticipate’ what might be involved in analogous situations and to understand how things connect and interact.

Approaches to synthesizing studies

Aggregative/ Integrative ⟷ Interpretive

- Aim: to aggregate or summarise data
- Concepts need to be clearly defined in advance
- Phenomena need to be comparable, to allow pooling
- Example: quantitative meta-analysis, meta-aggregation

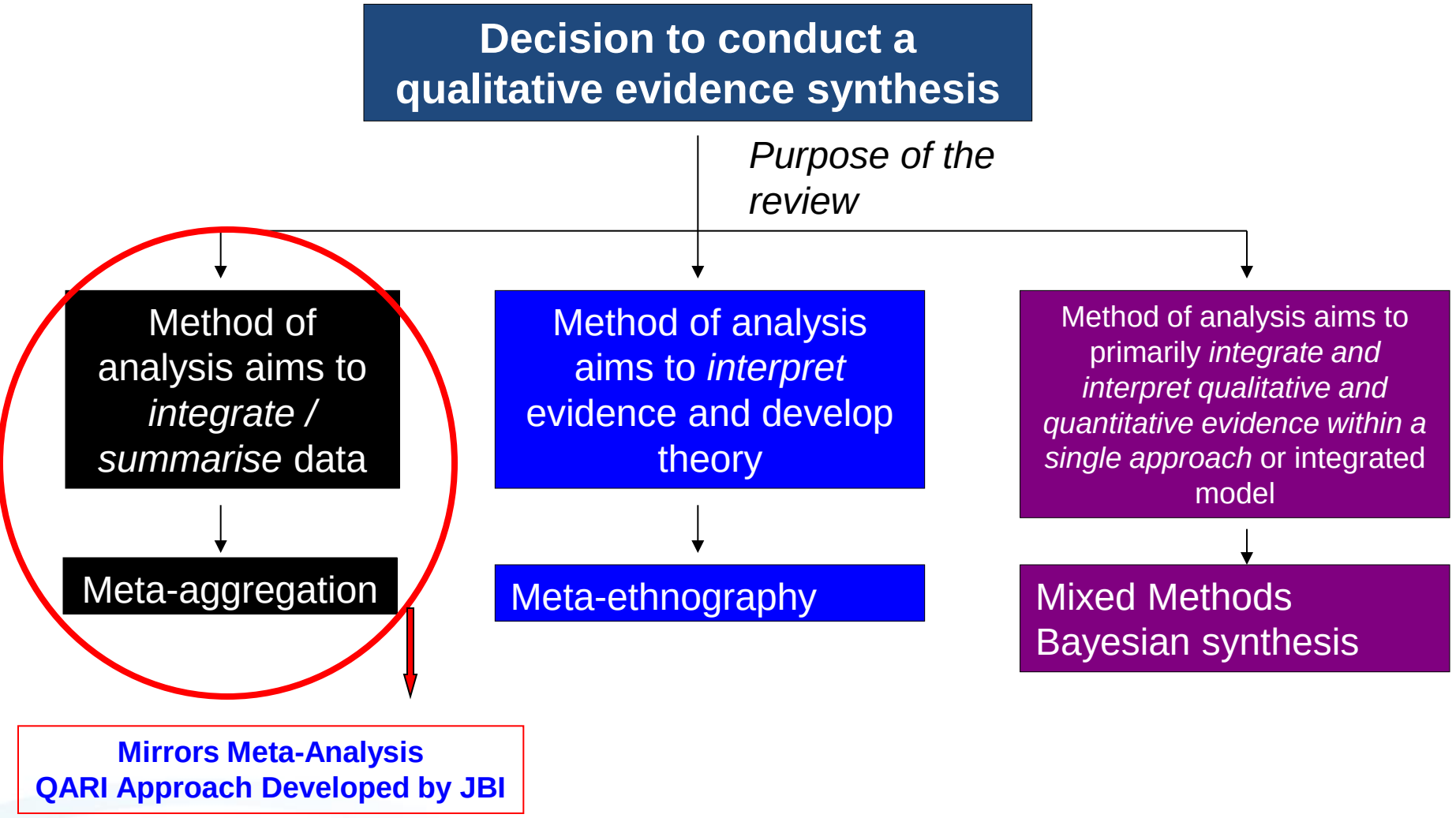
- Aim: to develop concepts or theories that integrate themes described in the primary studies
- Involves induction and interpretation
- Themes from the primary studies may be synthesized into a broader explanatory framework or new theory
- Concepts emerge through the synthesis process
- Example: meta-ethnography

Sources: Noblit and Hare 1988; Dixon-Woods et al. 2005

Choosing an appropriate qualitative evidence synthesis method

- Consider the purpose of the review:
  - the method needs to be appropriate to the purpose or aim of the qualitative evidence synthesis

- Examples:
  - The synthesis aims to develop new mid- level theory to meta-ethnography
  - The synthesis aims to develop guidance for action meta-aggregation


Decision to conduct a qualitative evidence synthesis
Purpose of the review
Method of analysis aims to integrate / summarise data
Meta-aggregation
Method of analysis aims to interpret evidence and develop theory
Meta-ethnography
Method of analysis aims to primarily integrate and interpret qualitative and quantitative evidence within a single approach or integrated model
Mixed Methods Bayesian synthesis
Mirrors Meta-Analysis
QARI Approach Developed by JBI

Examples of qualitative evidence synthesis: meta-ethnography

Aim: to understand the factors seen by patients, carers and health workers to contribute to tuberculosis medication adherence

- Sources of evidence: published qualitative studies of experiences of TB treatment, identified through systematic searching

Synthesis process:

Identified themes from included studies
Compared the themes in one article with the themes in others
Developed broader concepts that captured similar themes from different papers
Constructed an overarching framework that attempted to link these concepts together

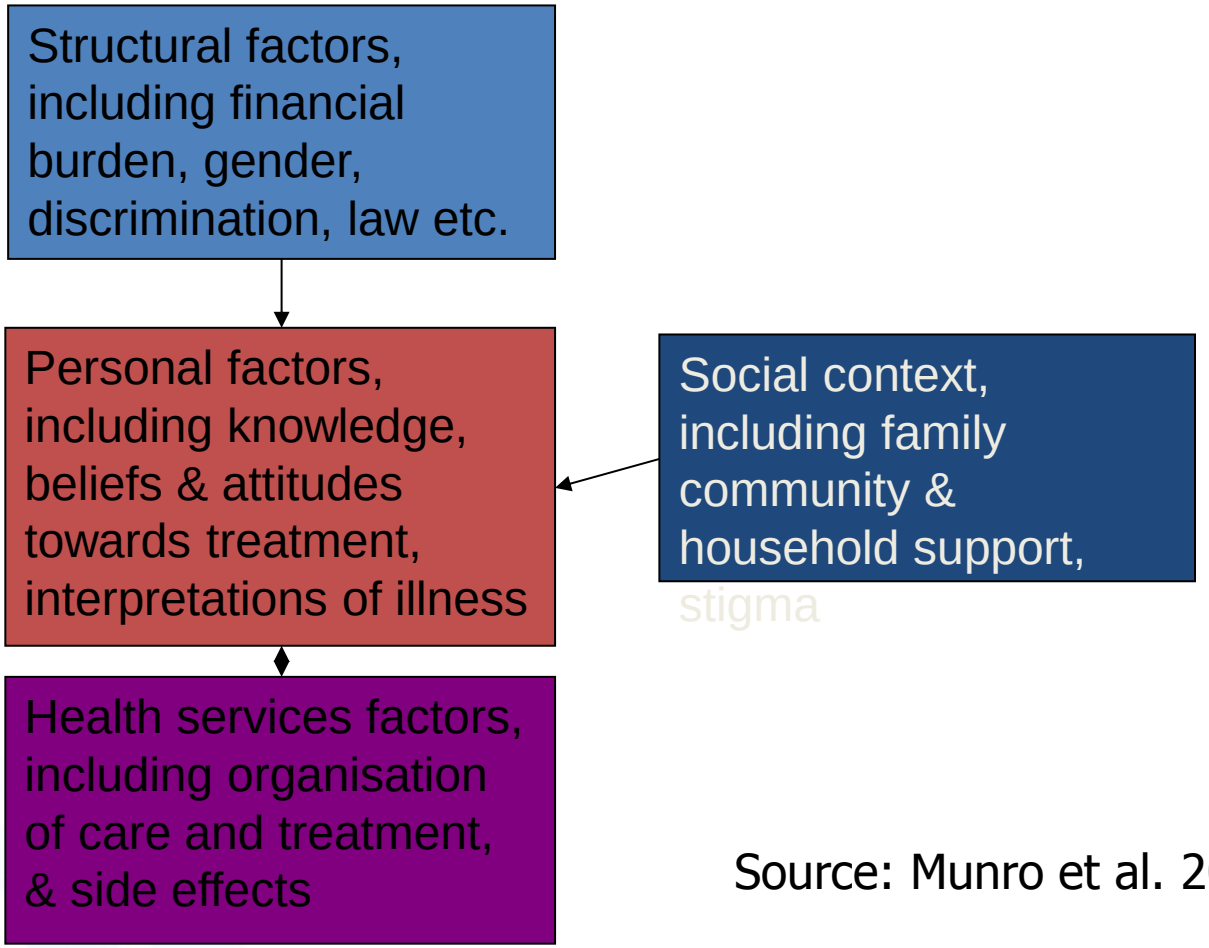
Interpretation rather than integration

Planned approach, inclusive

Findings of several studies combined to provide conceptual development

Sources: Munro et al. 2007; Munro et al 2008

Model of factors influencing adherence to TB treatment



Source: Munro et al. 2007

Key issues for meta-ethnography

- Careful consideration is needed of whether this is the most suitable synthesis approach
- Best suited to questions requiring interpretive rather than aggregative synthesis
- Is the approach feasible where a synthesis needs to include a large number of studies?

Examples of qualitative evidence synthesis: meta-aggregation

Aim: to synthesize all published qualitative research studies exploring patients' experiences of living with a leg ulcer

- Sources of evidence: published qualitative studies of experiences of living with a leg ulcer, identified through systematic searching

Synthesis process:

Themes and concepts from each included study were extracted

These were translated into findings, illustrated by a direct data extract

Findings grouped into categories

Categories then combined to create synthesized themes

Source: Briggs et al. 2007

More integrative than interpretive

Systematic approach, inclusive, comprehensive

Findings of several studies combined to generate broad themes

Examples of meta-aggregation

- Large number of Cochrane reviews on interventions to treat leg ulcers
- No reviews address interventions to provide psychological support to patients
- The qualitative evidence synthesis could contribute by defining review topics that address issues of high relevance to people living with leg ulcers

JAN REVIEW PAPER

Living with leg ulceration: a synthesis of qualitative research

Michelle Briggs & Kate Flemming

Accepted for publication 26 April 2007

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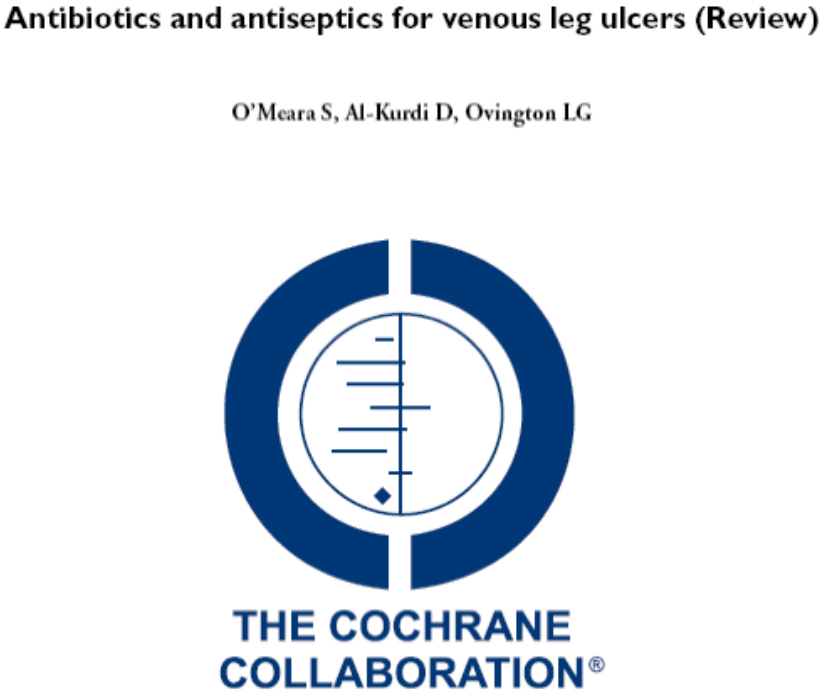
BRIGGS M. & FLEMMING K. (2007) Living with leg ulceration: a synthesis of qualitative research. *Journal of Advanced Nursing* 59(4), 319–328
doi: 10.1111/j.1365-2648.2007.04348.x



Antibiotics and antiseptics for venous leg ulcers (Review)

O'Meara S, Al-Kurdi D, Ovington LG

THE COCHRANE COLLABORATION®

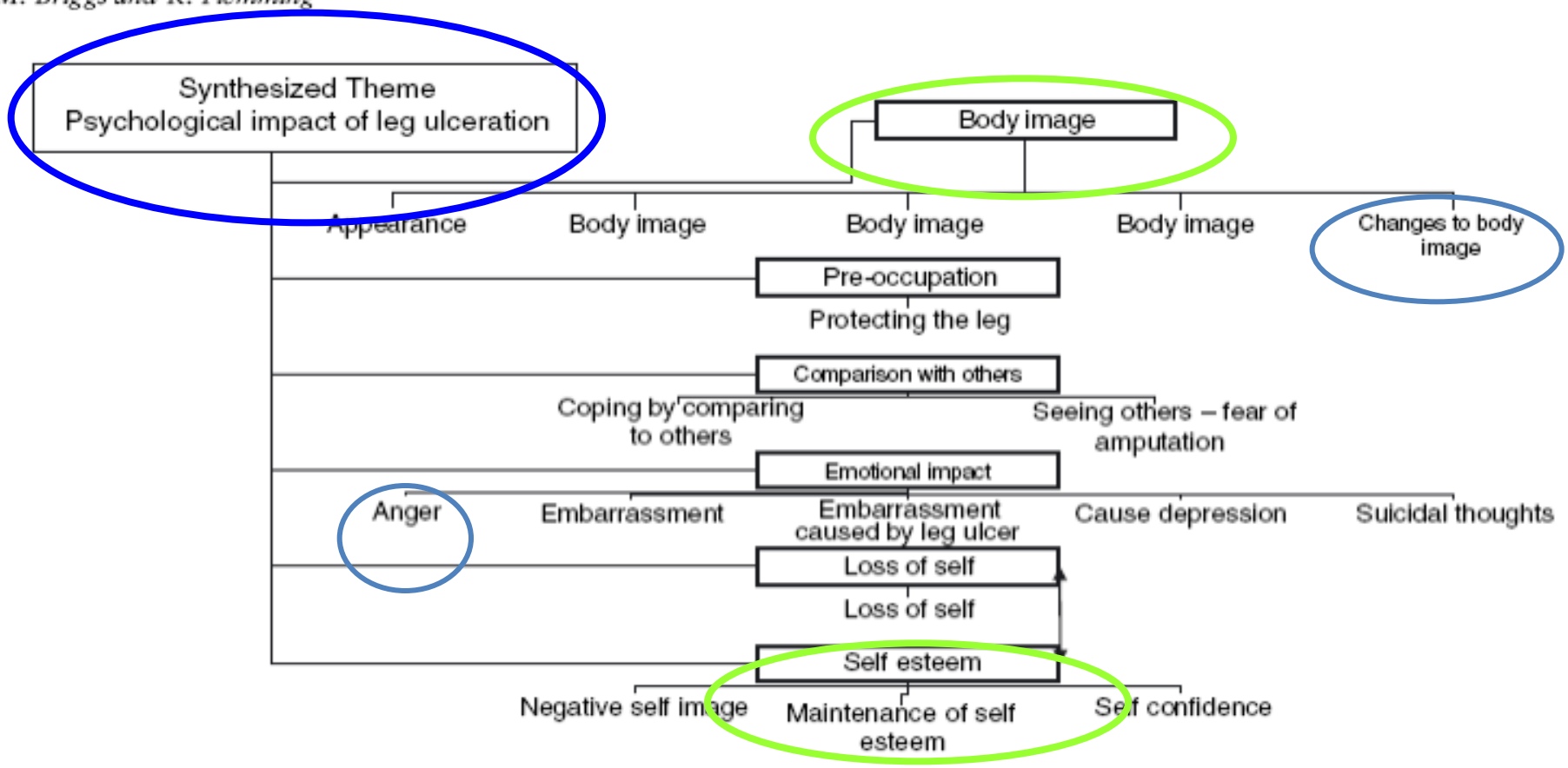


Figure 1 An example overview of one synthesized theme (the psychological impact of leg ulceration).
Box = the QARI categories developed from combining QARI findings.
Brackets = QARI findings developed from findings reported in individual papers, for example body image appears three times because three separate papers used that phrase. The reviewer where possible used the labels the original authors used for findings, where this was not possible notes were recorded and the reviewers discussed any differences in coding.

Source: Briggs et al. 2007

Meta aggregation

- A structured and process driven approach to the systematic review of qualitative evidence that draws on the classical understandings and methods associated with systematic review of quantitative evidence but is sensitive to the nature of qualitative research

Meta aggregation

- Based on an a-priori protocol
  - Established, answerable question
  - Explicit criteria for inclusion
  - Documented review methods for searching, appraisal, extraction and synthesis of data

Meta aggregation

- Explicitly aligned with:
  - Philosophy of pragmatism
    - Delivers readily useable findings
    - Informs decision making at the clinical or policy level
  - Transcendental phenomenology
    - Looks for common or “universal” essences of meaning
    - Attempts to “bracket” pre-understandings of the reviewer

Generalisability

- Sandelowski, Docherty, and Emden (1997 p366) suggest that the assumption by many qualitative researchers that the findings of their work are not generalisable is a falsehood because generalisation is *"narrowly conceived in terms of sampling and statistical significance."*

Generalisability

- Sandelowski et al (1997) say that *"qualitative research is directed toward naturalistic or idiographic generalizations, or the kind of generalizations made about particulars"*
- Sandelowski, Docherty and Emden (1997) citing Schofield (1990) describe qualitative metasynthesis as *"cross-case generalizations created from the generalizations made from, and about, individual cases."*

Generalisability

- Sandelowski, Docherty, and Emden (1997) cite Donmoyer's (1990, p. 176) observation that it is *"indefensible, dysfunctional, and out of touch with contemporary views of science not to recognize and value these kinds of generalisations"*

The Process of Meta-aggregation/ Integration

- Attempts to mirror the Cochrane process; modelled on an integrated, thematic analysis process
- The JBI approach to the meta-synthesis of the findings of qualitative research studies is embodied in the Qualitative Assessment and Review Instrument (QARI) QARI (pronounced Quarry) helps reviewers to mine or “dig for” evidence.

The Qualitative Assessment and Review Instrument (QARI)

The QARI approach to metasynthesis

- Extraction of themes, metaphors, findings or conclusions;
- The categorisation of these data on the basis of similarity in meaning; and
- Developing synthesised findings or conclusions representing an aggregation of categories.

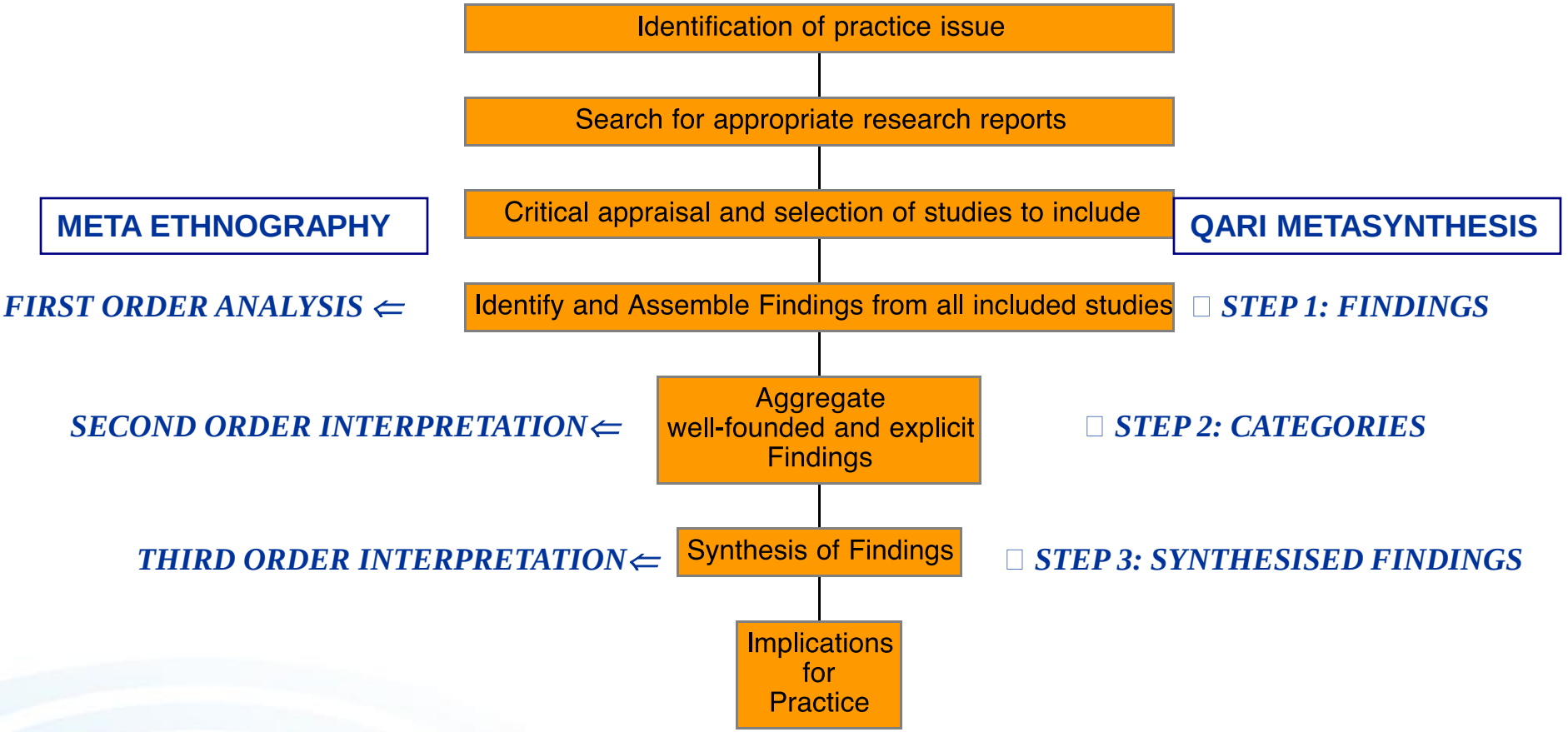
The QARI approach to metasynthesis

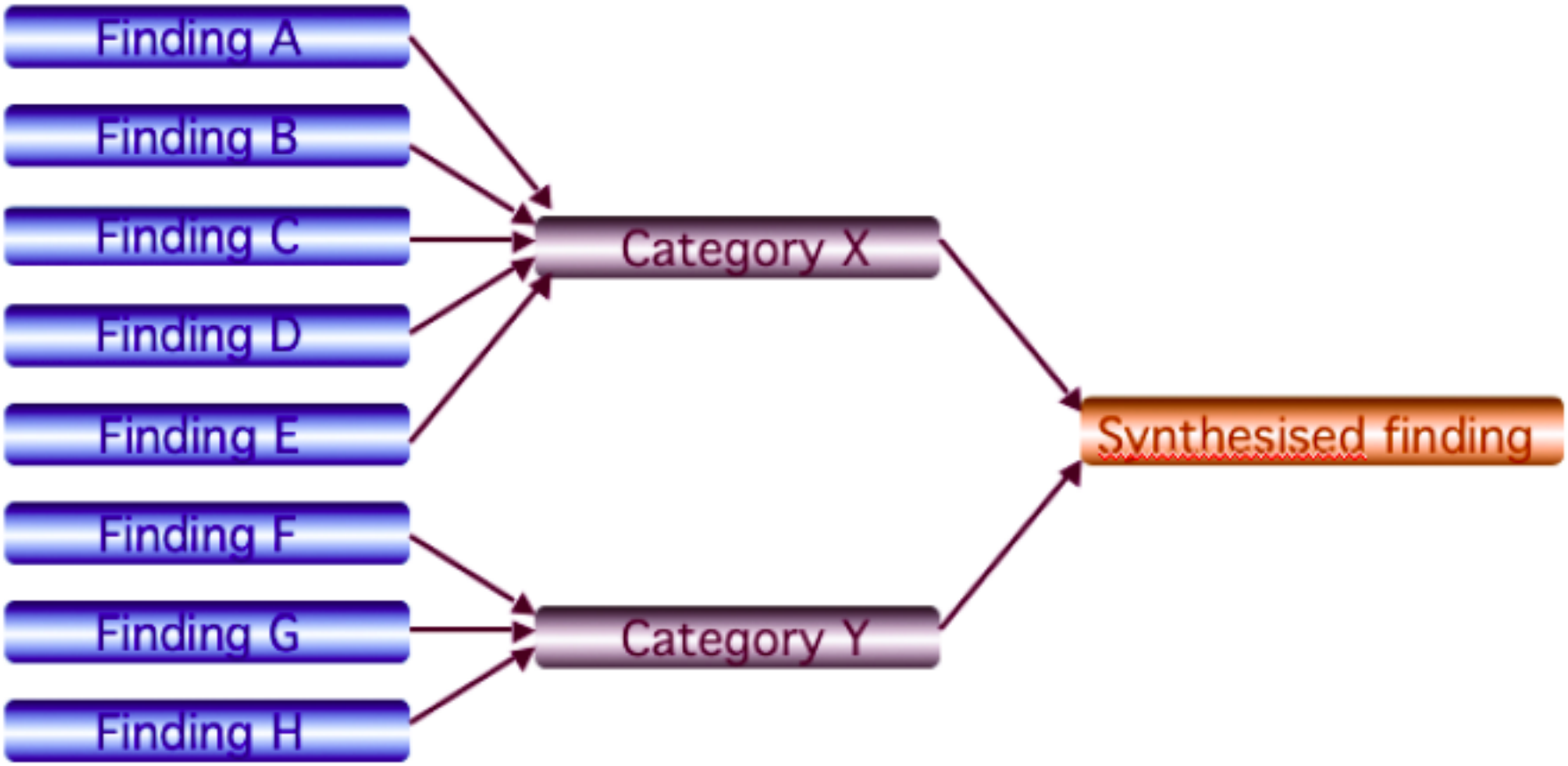
- Step 1: Identifying findings
- Step 2: Grouping findings into categories; and
- Step 3: Grouping categories into synthesised findings

Meta Ethnography

- Extracting “concepts” (First-order analysis)
- Second-order interpretation (Refutational and Reciprocal Analysis); and
- Third-order interpretation (“developing a line of argument”)

METASYNTHESIS OF QUALITATIVE RESEARCH STUDIES




Finding A
Finding B
Finding C
Finding D
Finding E
Finding F
Finding G
Finding H
Category X
Category Y
Synthesised finding

QARI

Qualitative Assessment and Review Instrument

Review: Implementation of EBP in Nursing, Midwifery and Allied Health in Australia

Synthesis	Category	Finding
Readiness for Change Change can only be succesfully promoted and implemented if a readiness or openess exisrs, This readiness is influenced by a number of factors.	Clinician knowledge of EBP increases their acceptibility of it	EBP is seen asa a way of controlling clinicians Evidence based guidelines minimise individualised patieny care Knowledge of the SR process increases clinian acceptance of EBP
	Felt need for change	Clinicians prioritise change projects Clinicians will adopt change if they feel it is an important and useful change
	Organisational Impacts on the implentation of change	Medical control over decisions impedes chagnge Organisational systems can militate against change

Add Synthesis

Print

Methodological challenges for qualitative evidence synthesis

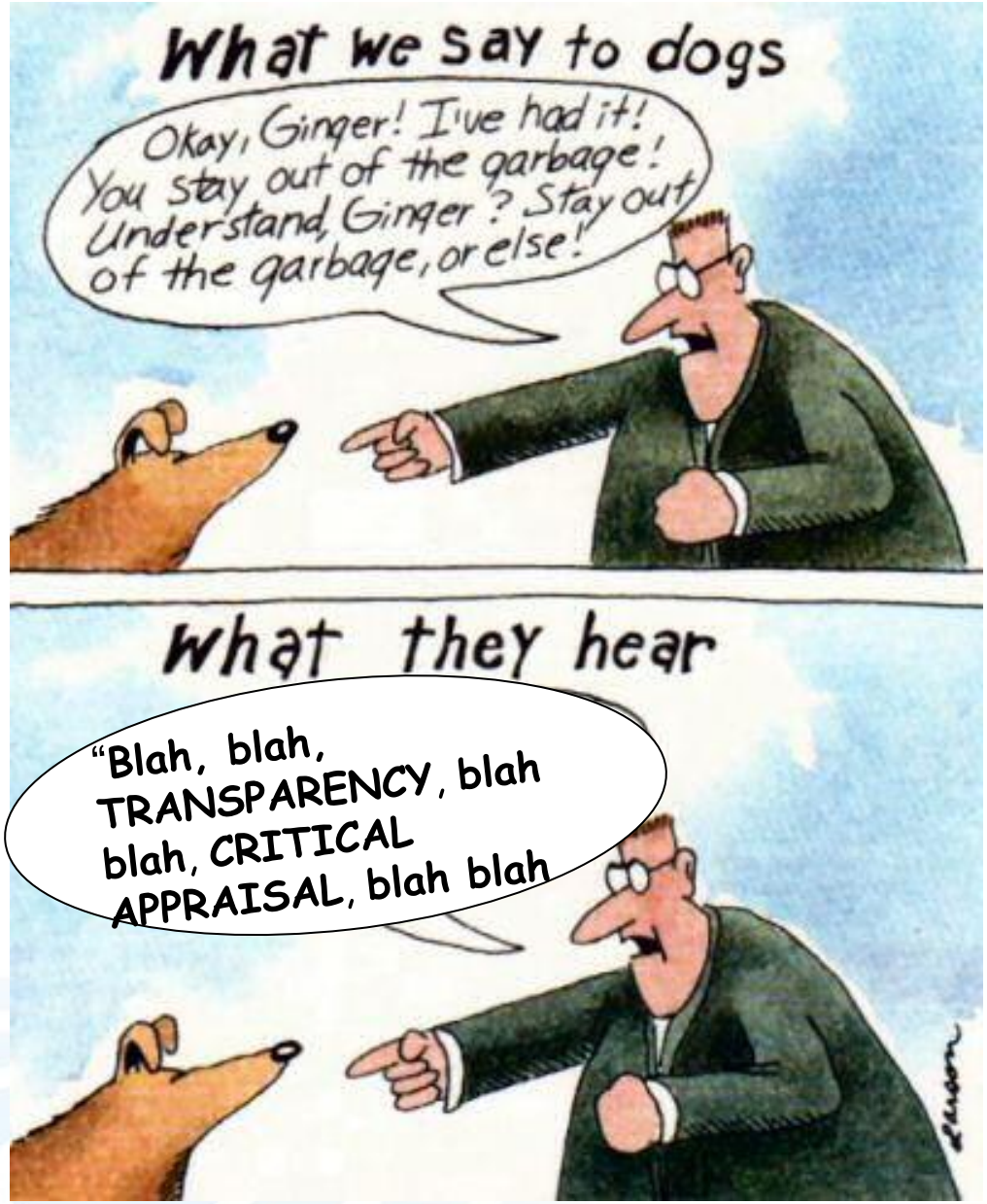
- What constitutes ‘evidence’ within qualitative studies?
- The proliferation of new synthesis approaches
- Capturing context and maintaining the integrity of the primary study findings within the synthesis
- Which approaches to synthesis are best suited to particular review questions?

Methodological challenges for qualitative evidence synthesis

- What constitutes ‘evidence’ within qualitative studies?
- The proliferation of new synthesis approaches
- Capturing context and maintaining the integrity of the primary study findings within the synthesis
- Which approaches to synthesis are best suited to particular review questions?
- Combining the findings of quantitative reviews of effects with those of qualitative reviews - which methodological approaches best facilitate this process?

Key messages on qualitative evidence synthesis

- The synthesis method needs to be ‘fit for purpose’
- Different synthesis approaches have somewhat different underlying philosophical assumptions



Systematic reviewers talking to non-systematic reviewers in excruciating detail about their review methods

- Britten, N., Campbell, R., Pope, C., Donovan, J., Morgan, M., & Pill, R. (2002). Using meta ethnography to synthesise qualitative research: A worked example. Journal of Health Services Research and Policy, 74, 209-215.
- Campbell, R., Pound, P., Pope, C., Britten, N., Pill, R., Morgan, M., & Donovan, J. (2003). Evaluating meta-ethnography: A synthesis of qualitative research on lay experiences of diabetes and diabetes care, Social Science & Medicine, 56 (4), 671-684.
- Pearson, A. Laschinger, H., Porritt, K., Jordan, Z., Tucker, D. and Long, L. ((2004) A comprehensive systematic review of evidence on developing and sustaining nursing leadership that fosters a healthy work environment in health care. Health Care Reports. 2(7) 2004 145-208
- Pearson, A., Porritt, K., Doran, D., Vincent, L., Craig, D., Tucker, D., Long, L. and Henstridge, V. (2006) A comprehensive systematic review of evidence on the structure, process, characteristics and composition of a nursing team that fosters a healthy work environment. International Journal of Evidence-Based Healthcare. 4: 2, 118-159, Jun 2006
- Konno, R. (2006) Support for overseas qualified nurses in adjusting to Australian nursing practice: a systematic review. International Journal of Evidence-Based Healthcare. 4: 2,, 83-100,
- Rhodes, L. and Pearson, A. (2006) Patient subjective experience and satisfaction during the perioperative period in the day surgery setting: A systematic review. International Journal of Nursing Practice. 12,: 4, 178-192

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