Lecture 3 – Options for integration: an overview

ESI Mixed methods evidence synthesis

14th and 15th October
Aishling Hotel, Dublin

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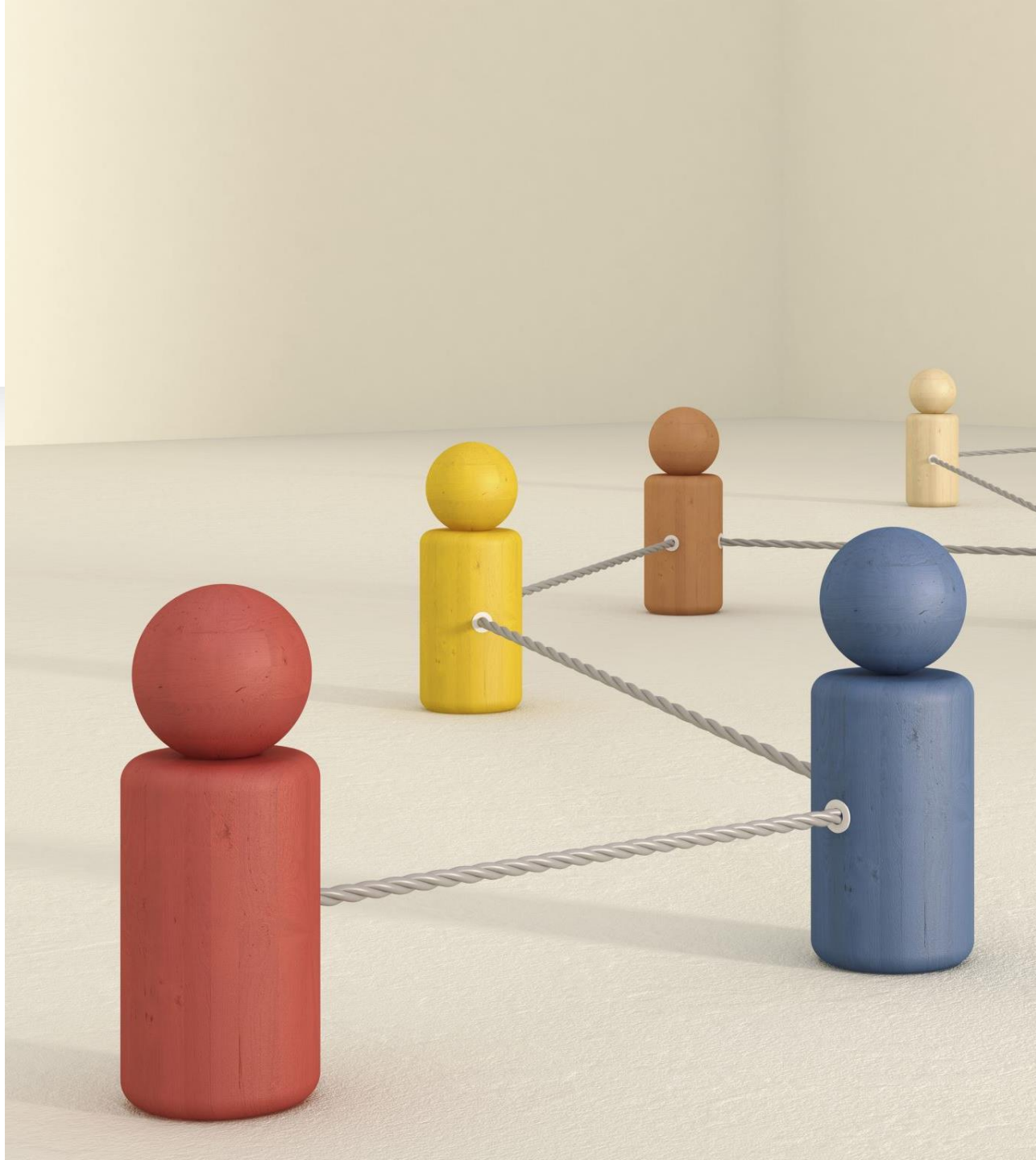
What we'll cover in this session:

1. Overview of three broad approaches to integration
   - Assimilation
   - Comparison
   - Connection
2. Considerations – when to use different approaches and their strengths / limitations
3. Activity – recognising different approaches to integration



What is mixed-method synthesis?

'Systematic reviews combining qualitative and quantitative *evidence'*

(Hong 2017)

- Various labels
  - integrative review
  - mixed methods review
  - mixed methods research synthesis
  - mixed research synthesis
  - mixed studies review
- Brings together research
  - From micro and macro view – high level patterns in behaviours and outcomes – with contextually rich experiences of phenomenon
  - From **epistemologically diverse** methodological approaches – based on different world views about what we can know / is important to know

(Hong et al. 2017 Convergent and sequential synthesis designs: implications for conducting and reporting systematic reviews of qualitative and quantitative evidence)

Not one-size fits all …

Hong et al. 2020 Variations of mixed methods reviews approaches: A case study

"One challenge when conducting this case study was about defining and conceptualizing mixed methods reviews. The included reviews were ***bespoke and driven by the questions*** *that can be addressed based on the needs and* ***concerns of the policy-makers****, as well as the* ***available evidence****,* ***resources*** *and* ***time****."*

Typologies for mixed-methods evidence synthesis

- Many typologies offer high-level overview of how different types of evidence are brought together in a single review – e.g.:
  - Hong et al. (2017): Sequential vs Convergent
  - Sandelowski et al. (2006): Segregated, integrated, contingent
- But *"Details about techniques [for integration] are so often missing or unclear"* (Ferguson et al. 2020)
- More recent work with Hong (Hong et al. 2020) focuses on the detail of **'how to integrate'**.
- Identifies three broad approaches.

Three approaches for integration

Assimilate (merge)

Compare = (juxtapose)

Connect (use one to inform other)

Assimilation

- **Purpose:** To increase pool of available evidence
- **Question:** Typically designed to answer a single question
- **Assumptions:** Qualitative and quantitative evidence on a similar topic can address the same research question(s) and so that they can be synthesised together.
- **Strategy:** Transform one type of evidence (qualitative or quantitative) into other type so both sets can be merged together.
  - Methods mostly focused on transforming quantitative into qualitative or 'qualitising' – e.g. qualitative evidence extracted from studies typically defined as 'quantitative' or numerical data from quantitative studies (e.g., percentages) are transformed into words and / or themes so can be merged with data from qualitative studies to develop theory – e.g. realist reviews
  - Small body of work on 'Quantifying' qualitative evidence – i.e. calculating 'qualitative effect sizes' to quantify the strength of relationships found within qualitative research (See van Grootel et al 2020) but remains controversial and contested

Example MMSR using ‘qualitizing’: Guillaume et al 2020

Analysis of Studies

Data from quantitative and qualitative studies were integrated and analyzed using thematic analysis combined with a deductive approach. Quantitative data from surveys and questionnaires were qualitized and coded (Aromataris & Munn, 2017; Nzabonimpa, 2018; Thomas & Harden, 2008). Data from qualitative studies were coded line-by-line (Saldana, 2009). Patterns were searched for amongst coded data, and codes were subsequently categorized into descriptive themes (Aromataris & Munn, 2017; Nzabonimpa, 2018; Saldana, 2009; Thomas & Harden, 2008).

Barriers to Cervical Cancer Screening Among Women Living With HIV in Low- and Middle-Income Countries: A Systematic Review

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Abstract
Women living with HIV in low-and-middle-income countries (LMICs) are at high risk of developing cervical cancer due to their immunocompromised status. Screening is an imperative prevention measure for early detection and for ultimately reducing high rates of cervical cancer; however, cervical cancer screening uptake among this group remains low. This systematic review aimed to identify barriers to cervical cancer screening among women living with HIV in LMIC. A comprehensive literature search was undertaken, and an analysis of included studies was completed to abstract major themes related to cervical cancer screening barriers for women living with HIV in LMIC. Lack of cervical cancer and cervical cancer screening knowledge among patients was found to be the most prevalent barrier to cervical cancer screening. Our findings highlight a dire need for interventions to increase knowledge and awareness of cervical cancer screening among women living with HIV in LMIC, along with addressing barriers within health care systems.

Key words: developing countries, female, health promotion, human papilloma virus, sexual and reproductive health

Comparison

- **Purpose:** To examine varied facets of the same complex phenomenon (iceberg!)
- **Question:** Separate question(s) for QES, quantitative synthesis and mixed-method synthesis
- **Assumptions:** The distinct methods and worldviews underpinning qualitative and quantitative evidence mean that they must be synthesized separately – but that the findings of one type of evidence can help to explain the findings of the other.
- **Strategy:** To juxtapose findings from QES and quantitative / effectiveness synthesis to offer insight about how findings may be interpreted.

Example of a comparison approach

Do any of the interventions feature the recommendations derived from children's views?

Children's views	Outcome evaluations	
Recommendation for interventions	**Good quality**	**Other**
Do not promote fruit and vegetables in the same way	No soundly evaluated interventions	No other interventions identified
Brand fruit and vegetables as an 'exciting' or child-relevant product, as well as a 'tasty' one	5 soundly evaluated interventions identified	5 other interventions
Reduce health emphasis in messages to promote fruit and vegetables particularly those which concern future health	5 soundly evaluated interventions identified	6 other interventions identified

Example of a comparison approach #2

- To what extent does *each intervention* reflect the implications for interventions derived from the QES?

Studies included in relevant Cochrane effectiveness reviews	Was the intervention designed to address the following factors?						
	1	2	3	4	5	6	7
Andersson 2009	Y	Y	Y	Y	N	N	N
Alto 1994	N	N	N	N	N	N	N
Banerjee 2010	N	N	Y	N	Y	N	N
Bangure 2015	N	N	N	N	N	N	N
Barham 2005	N	N	Y	N	Y	N	N
Bjornson 1997	?	N	N	N	N	N	N
Bolam 1998	P	N	N	N	N	N	?
Brown 2016	N	N	N	N	N	N	Y
Brugha 1996	N	N	N	Y	N	N	N
Campbell 1994	N	N	N	N	N	N	N
CDC 2012	N	N	N	N	N	N	N
Daley 2002	N	N	N	N	N	N	N
Daley 2004a	?	N	N	N	P	N	N
Daley 2004b	?	N	N	N	P	N	N
Dicko 2011	N	Y	Y	N	N	N	N
Dini 2000	?	N	N	N	N	N	N
Djibuti 2009	N	N	N	N	N	N	Y
Dombkowski 2012	N	N	N	N	N	N	N
Dombkowski 2014	N	N	N	N	N	N	N
Ferson 1995	?	N	N	N	N	N	N

What to compare and how?

	If your aim is …	What to compare	Comparison tool
1	To illustrate weight of evidence supporting QES themes / gaps in evidence.	QES themes compared with quant findings	Matrix
2	To illustrate extent to which interventions reflect needs / preferences identified in QES.	QES themes compared with Individual interventions	Matrix
3	To illustrate whether effectiveness evidence supports overarching QES theory.	QES theory compared with quant findings	Annotated logic model
4	To illustrate how results of QES and effectiveness synthesis are discordant	QES themes compared with quant findings	Line of argument

Strengths of comparison approach

- *Preserves integrity* of findings of different types of studies
  - Because each ‘type’ is synthesised separately
- Separate synthesis allows *juxtaposition* of e.g.:
  - views about what is important with features of evaluated interventions (healthy eating review)
  - Micro (e.g. how and why) (qualitative views) and macro (e.g. which) (survey data)
- This juxtaposition allows ***theory development*** around what may (or may not have) contributed to intervention outcomes / observed behaviours

Connection

- **Purpose:** To use the findings of one synthesis to inform the conduct and focus of another
- **Question:** Separate question(s) for QES, quantitative synthesis and mixed-method synthesis
- **Assumptions:** The distinct methods and worldviews underpinning qualitative and quantitative evidence mean that they must be synthesized separately – but that the synthesis of one type of evidence can inform the synthesis of the other.
- **Strategy:** To connect findings from QES and quantitative / effectiveness synthesis - e.g. to test QES derived theories using effectiveness evidence.

Example of a connection approach

Do the QES findings explain why some interventions are more successful than others?

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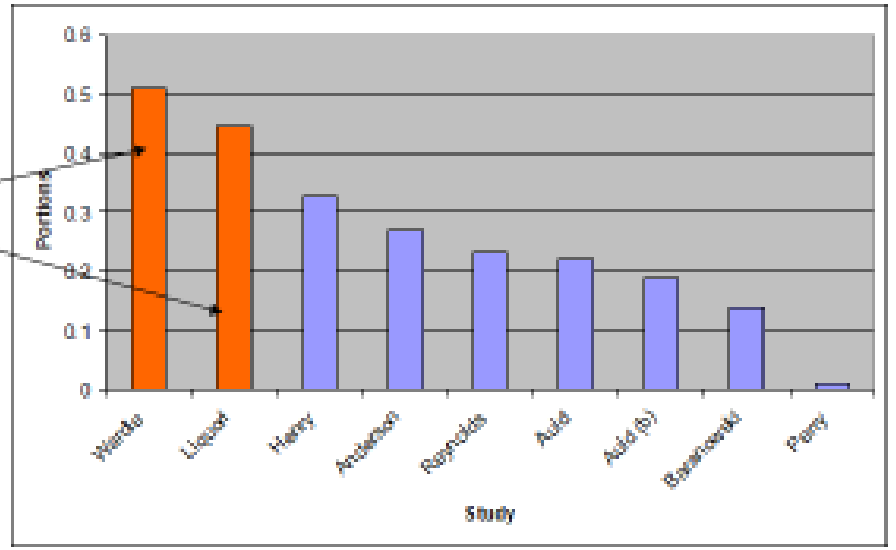
Cross study synthesis: an example of sub-group analysis

Increase (standardised portions per day) in vegetable intake across trials

Little or no emphasis on health messages



Aim	What to connect	Connection tool
5. To derive hypotheses from QES that can then be **tested** using effectiveness / quantitative data.	QES themes inform Effectiveness synthesis	Sub-group analysis
6. To identify key intervention, contextual or implementation factors that may influence outcomes from a QES. Combinations of interrelated factors **tested** via QCA.	QES themes inform Analysis of intervention complexity	Qualitative comparative analysis (QCA)
7. To ensure QES findings can be translated for policy and practice. Findings of effectiveness research used as framework to **guide** extraction and synthesis of qualitative data for the QES.	Effectiveness synthesis informs QES	Framework

What to connect and how?

Strengths of connection approach

- Also preserves the integrity of the findings of the different types of studies
- But allows us to test our emerging theories
  - Allows us to explore ‘quantitative’ estimates of benefit and harm using ‘qualitative’ understanding from people’s lives
  - Allows exploration of heterogeneity in quant data in ways in which it would be difficult to imagine in advance
- BUT protects against ‘data dredging’!

Practicalities: variation in form of review

MMSR which integrate QES and effectiveness evidence may take a number of forms:

1. A new review which incorporates both a QES and an effectiveness synthesis and where the plan is to integrate from the outset.
2. A “post hoc” QES linked to a completed effectiveness synthesis.
3. A “post hoc” effectiveness synthesis linked to a completed QES.
4. Integration of existing QES and effectiveness syntheses.

Which approach to use?

- Form of overarching review may restrict options for integration
- Selection of approach also needs to balance aims / purpose vs which is most suited to available evidence
- What is possible / preferable may not be known at outset – need to tailor approach to evidence at hand
- Goal is to make most of having diverse evidence types
- These are examples seen in literature so far – MMSR is inherently creative – what else is possible?

Activity 3 – exploring variation in approaches to integration

ESI Mixed methods evidence synthesis

25th and 26th September
Galway Bay Hotel

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Activity 3: Exploring variation in approaches to integration

- **Aim:** To recognize differences between integration approaches
- **Materials:** Worksheet contains:
- Examples of different approaches to integration in MMSR
- Definitions for ‘assimilation’, ‘comparison’ and ‘connection’
- Table with options for assimilation, comparison and connection
- **Objective:** With your group examine and discuss one (or more) examples of integration and:
- Identify whether the example uses assimilation comparison or connection
- Identify how assimilation / comparision / connection is achieved using table
- Consider the value / limitations of the approach