Integrating qualitative evidence syntheses with intervention effect findings

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Conflict of Interest Statement

We have no actual or potential conflicts of interest in relation to this presentation.

Angela Harden and James Thomas
Overview of whole program

1. Introduction to qualitative research and qualitative evidence synthesis (28th October 2021)
2. Question formulation and searching for qualitative evidence (15th November 2021)
3. Selecting studies and methodological limitations (13th December 2021)
4. Making sense of Framework and Best Fit Framework synthesis (20th January 2022)
5. Thematic Synthesis (24th February 2022)
6. Meta-ethnography (17th March 2022)
7. GRADE CERQual (25th April 2022)
8. Integrating qualitative and quantitative syntheses (16th May 2022)
Webinar outline

• Introduction to the workshop (5 mins)
• The big picture: why integrate (10 mins)
• Overview of integration designs, methods and tools (10 mins)
• Examples (20 mins)
• Questions (10-15 mins)
The big picture: Why integrate?

An brief introduction of key issues
Acknowledgements

MRC methodology project ‘MACH’ - Mark Petticrew, Alison O’Mara-Eves, Theo Lorenc, G.J. Melendez-Torres, Sian Thomas, Lambert Felix, Katy Sutcliffe, Dylan Kneale

Papers / thinking from many people including Diane Finegood, Penelope Hawe, Harry Rutter, Alan Shiell + many more

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Epistemic security

• Challenge: we need to consider how to provide evidence to inform real world decisions

BUT

• We are more secure with some accounts than others

• Epistemic security in causal thinking
• Counterfactual and probabilistic accounts
• Regularity and mechanistic accounts
• Epistemic (in)justice in selecting which perspectives are important
Types of question

Is intervention a better than intervention b?

Which intervention should I choose for treating condition x in this population?
Conventional and new approaches to answer conventional questions

**Traditional pair-wise comparisons**

**Network meta-analysis**

Both provide strong causal claims
Simple – and strong – causal model

- The synthesis of randomized trials provides strong evidence of effect
- This works when we can be fairly certain that our cause is the reason we see an effect – we have a strong counterfactual
- The question then is:
  - how often the cause has the effect of interest
  - how large is the effect?
  - and how consistent?
Face masks / coverings

- A simple mechanism: a barrier preventing / reducing SARS-CoV-2 from entering or leaving the mouth / nose

- Some studies address an exact question of efficacy – finding that masks can indeed prevent virus particles from moving in both directions

- Question: do masks ‘work’?

“Do masks work..?”
Moving from understanding the action of a barrier to a policy of using that barrier...

Approach for the Monitoring and Evaluation of Wearing Masks

Governments, organizations, and individuals support and promote community mitigation across settings and sectors with special attention to disproportionately affected populations

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Outcomes</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implement wearing masks as a community mitigation strategy that prevents spread of COVID-19, and maintain healthy environments and operations</td>
<td>Reduce exposure among individuals</td>
<td>Minimize COVID-19 morbidity and associated mortality</td>
</tr>
<tr>
<td></td>
<td>Reduce transmission</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reduce burden on the health care system</td>
<td>Thrive socially, emotionally, and economically</td>
</tr>
</tbody>
</table>

Critical considerations
- Ensure individual and community ability to adopt and sustain wearing masks
- Mitigate adverse effects and impacts on health disparities and social determinants of health
- Foster mental and emotional health and resilience
- Minimize negative physical, mental, and emotional challenges related to wearing masks

... do masks work?

When (even ‘simple’) interventions are introduced into complex contexts, they can generate unintended consequences.
‘Complex’ intervention

- Non-linear effects
- Phase changes
- Feedback loops
- Causal pathways less well understood
- Less predictable
Challenging to understand causality in linear, predictable ways...

- The linear model of causation can break down when:
  - there are long causal pathways between intervention and outcome
  - there are many possible factors influencing intervention outcome
  - intervention replication is rare / impossible
  - ‘examples’ of interventions differ
    - selection of components
    - lots of heterogeneity
How does / did the intervention work?

• Under what circumstances does the intervention work

• What is the relative importance of, and synergy between, different components of multicomponent interventions?

• What are the mechanisms of action by which the intervention achieves an effect?

• What are the factors that impact on implementation and participant responses?

• What is the feasibility and acceptability of the intervention in different contexts?

• What are the dynamics of the wider system?
Focus of enquiry changes

• Questions change from looking at how often / reliable / large a given effect is

• Because there is no single effect

• Questions focus on explanation and understanding

• Why was the effect observed in that situation?

• What drives differences in outcomes between studies?
Integrating different types of evidence can help

- Individual studies may struggle to cover all of the ‘angles’ necessary
- BUT
- Synthesising different types of evidence can enable reviewers to include more of the relevant evidence base

- Systematic reviews are traditionally good at addressing questions of size and consistency of effect,
- BUT
- Are less good at questions of how and why we see variations in effect
Challenges for evidence synthesis

High conventional epistemic security takes few risks, but comes at a high cost in terms of utility.

Arguably, this paradigm means abandoning the possibility of evidence-informed policy & practice in many areas.

Integrating different types of evidence overcomes limitations in ‘mono-method’ reviews, and leads to more useful / useable reviews.
Overview of approaches, methods and tools

For integrating qualitative evidence syntheses with intervention effect findings

Acknowledgement: this part of the webinar builds on a previous workshop on the same topic

A reminder: What is qualitative evidence synthesis?

The process by which individual studies addressing issues of context, process and experience are identified, brought together and combined into a whole to produce new or enhanced understanding.
Why integrate?

Qualitative Evidence Synthesis

Intervention Effects Review
Cochrane Intervention Review

Qualitative Evidence Synthesis
Guidance on integration from our Cochrane QIMG

Synthesising quantitative and qualitative evidence to inform guidelines on complex interventions: clarifying the purposes, designs and outlining some methods

Jane Noyes, Andrew Booth, Graham Moore, Kate Flemming, Özge Tunçalp, Elham Shakibazadeh

ABSTRACT

guideline developers are increasingly dealing with more
difficult decisions concerning whether to recommend
complex interventions in complex and highly variable

Chapter 21: Qualitative evidence

Jane Noyes, Andrew Booth, Margaret Cargo, Kate Flemming, Angela Harden, Janet Harris, Ruth Garside, Karin Hannes, Tomas Pantoja, James Thomas

Key Points:

- A qualitative evidence synthesis (commonly referred to as QES) can add value by providing decision makers with additional evidence to improve understanding of intervention complexity, contextual variations, implementation, and stakeholder preferences and experiences.
- A qualitative evidence synthesis can be undertaken and integrated with a corresponding intervention review; or
- Undertaken using a mixed-method design that integrates a qualitative evidence synthesis with an intervention review in a single protocol.
- Methods for qualitative evidence synthesis are complex and continue to develop. Authors should always consult current methods guidance at methods.cochrane.org/qi

Opportunities for integration

(1) Conducting a “post hoc” qualitative evidence synthesis linked to a completed Cochrane effectiveness review

(1) Conducting a new Cochrane review which plans to integrate a synthesis of qualitative evidence with an effectiveness synthesis from its beginning.

*The main challenge in both scenarios is how to get the different types of research evidence within, or across, the reviews to “speak” to each other.*
Methods and tools for integration

<table>
<thead>
<tr>
<th>Using a logic model or other type of conceptual framework</th>
<th>Analysing programme theory</th>
<th>Juxtaposing findings in a matrix</th>
<th>Testing hypotheses generated from QES with effectiveness data</th>
<th>Qualitative comparative analysis (QCA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Framework to capture how an intervention works/is implemented and used as common scaffold which the different syntheses can feed into.</td>
<td>Theories underlying how interventions are expected to work are surfaced; findings from the different syntheses are used to examine whether and how the theory works in practice</td>
<td>Themes from a QES are compared with findings on intervention effectiveness. Matches, gaps and mismatches identified.</td>
<td>Hypotheses on intervention effectiveness generated by QES tested by grouping studies according to the presence or absence of the proposition specified by the hypotheses</td>
<td>QES identifies range of features important for intervention success; QCA then uses data from trials to examine whether these features were associated with success</td>
</tr>
</tbody>
</table>

1 Harden et al. (2018) Cochrane Qualitative and Implementation Methods Group guidance series—paper 5: methods for integrating qualitative and implementation evidence within intervention effectiveness reviews *Journal of Clinical Epidemiology* 97, Pages 70-78
Community engagement to reduce inequalities in health: a systematic review, meta-analysis and economic analysis

A O’Mara-Eves, G Brunton, D McDaid, S Oliver, J Kavanagh, F Jamal, T Matosevic, A Harden and J Thomas

1Evidence for Policy and Practice Information and Co-ordinating Centre, Social Science Research Unit, Institute of Education, London, UK
2Personal Social Services Research Unit and European Observatory on Health Systems and Policies, London School of Economics and Political Science, London, UK
3Institute for Health and Human Development, University of East London, London, UK
4Personal Social Services Research Unit, London School of Economics and Political Science, London, UK

*Corresponding author

Declared competing interests of authors: none

Published XXXX 2013
DOI: 10.3310/xx0000

This report should be referenced as follows:

Slides on this review from: Thomas, Brunton O’Mara-Eves (2013) Community engagement strategies to reduce health inequalities… SPHR@L seminar, LSHTM, October 10th
E.g. a systematic review addressing complex questions
131 studies in the meta-analysis
• Approximately 50% ‘sound’ in terms of RoB
At least 200 possible covariates
We need > 10 times more research
E.g. a systematic review addressing complex questions

131 studies in the meta-analysis

- Approximately 50% ‘sound’ in terms of RoB

At least 200 possible covariates

We needed >> 10 times more research
Theoretical Perspectives from literature review team & advisors

Intervention descriptions

Intervention processes participation rates, perspectives*

Intervention outcomes categories, effect sizes

Intervention costs/benefits*

Data

Syntheses

Community engagement to reduce health inequalities

Theoretical synthesis

Meta-analysis but huge heterogeneity

Explored variations in intervention effects in a theoretically grounded way

Theories of change operationalised into an analytical model

*also synthesised separately

Slide from: Rees, Sutcliffe, Thomas (2013) Configurational ‘qualitative’ synthesis for evidence-based policy & practice… 21st Cochrane Colloquium, Quebec
Developed specific theories of change
Analysing programme theory

Realist review to understand the efficacy of school feeding programmes

A recent Cochrane review found that school feeding programmes significantly improve the growth and cognitive performance of disadvantaged children. Trisha Greenhalgh, Elizabeth Kristjansson, and Vivian Robinson look more closely at the highly heterogeneous trials to see what works, for whom, and in what circumstances.

Our Cochrane review of school feeding programmes in disadvantaged children included trials from five continents and spanned eight decades. Although we found that the programmes have significant positive effects on growth and cognitive performance, the trials had many different designs and were implemented in varying social contexts and educational systems; by staff with different backgrounds, skills, and cultural beliefs; and with huge variation in the prevailing social, economic, and political context. Simply knowing...
### Juxtaposing findings in a matrix

<table>
<thead>
<tr>
<th>Recommendation for interventions</th>
<th>Trials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good quality</td>
</tr>
<tr>
<td>Do not promote fruit and vegetables in the same way</td>
<td>0</td>
</tr>
<tr>
<td>Brand fruit and vegetables as an ‘exciting’ or child-relevant product, as well as a ‘tasty’ one</td>
<td>5</td>
</tr>
<tr>
<td>Reduce health emphasis in messages to promote fruit and vegetables particularly those which concern future health</td>
<td>5</td>
</tr>
</tbody>
</table>

Thomas J, Harden A, Oakley A, Oliver S, Sutcliffe K, Rees R, Brunton G, Kavanagh F. (2004) Integrating Qualitative Research with trials in systematic reviews: an example review from public health shows how integration is possible and some potential benefits. BMJ 328: 1010-12
Testing hypotheses generated through QES

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

Little or no emphasis on health messages

Thomas J, Harden A, Oakley A, Oliver S, Sutcliffe K, Rees R, Brunton G, Kavanagh F. (2004) Integrating Qualitative Research with trials in systematic reviews: an example review from public health shows how integration is possible and some potential benefits. BMJ 328: 1010-12
### Qualitative Comparative Analysis (QCA)

#### Table 3.7: Configurations represented in the provider alliance model

<table>
<thead>
<tr>
<th>Direct provision of exercise</th>
<th>Provider relationships</th>
<th>Graduated exit</th>
<th>High intensity</th>
<th>Number of most effective interventions</th>
<th>Number of least effective interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>Present</td>
<td>Present</td>
<td>Present</td>
<td>5</td>
<td>0</td>
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<td>Absent</td>
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<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

Sutcliffe et al. (2016) What are the critical features of successful Tier 2 weight management programmes?: A systematic review to identify the programme characteristics, and combinations of characteristics, that are associated with successful weight loss. London: EPPI-Centre, Social Science Research Unit, UCL Institute of Education, University College London.
QCA can identify combinations of intervention components leading to high or least effectiveness

Sutcliffe et al. (2016) What are the critical features of successful Tier 2 weight management programmes?: A systematic review to identify the programme characteristics, and combinations of characteristics, that are associated with successful weight loss. London: EPPI-Centre, Social Science Research Unit, UCL Institute of Education, University College London.
School-based self-management interventions for asthma in children and adolescents: a mixed methods systematic review (Review)

Harris K, Kneale D, Lasserson TJ, McDonald VM, Grigg J, Thomas J
Factors to consider in choice of methods and tools for integration

<table>
<thead>
<tr>
<th>Method</th>
<th>Strengths</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using a conceptual framework such as a logic model</td>
<td>Facilitates holistic integration</td>
<td>May ‘squeeze’ data into model</td>
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<tr>
<td></td>
<td>Development of framework is flexible</td>
<td>Qual and Quant may not correspond/both exist</td>
</tr>
<tr>
<td>Analysing programme theory</td>
<td>Facilitates holistic integration</td>
<td>Expertise in programme theory required (e.g. realist evaluation)</td>
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<td>Formalises analysis and testing of theory</td>
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<tr>
<td>Juxtaposing findings from across syntheses in a matrix</td>
<td>Matrix relatively simple; does not require specialist skills or software</td>
<td>Intervention characteristics are examined one by one</td>
</tr>
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<td></td>
<td>Can aid explorations of heterogeneity in trials and identify research gaps.</td>
<td></td>
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<tr>
<td>Testing hypotheses using sub-group analysis</td>
<td>Hypotheses from qualitative synthesis can be tested statistically</td>
<td>Requires sufficient numbers of trials to conduct sub-group analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intervention characteristics are examined one by one</td>
</tr>
<tr>
<td>Qualitative comparative analysis</td>
<td>Able to examine multiple features across multiple contexts</td>
<td>Requires a relatively large number of trials, Expertise in QCA required</td>
</tr>
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</table>
Appraisal questions

**Integration approach:** Which approach is used to integrate the findings of the qualitative and quantitative syntheses?

**Method / tool:** What is the method or tool used in each review to integrate the qualitative and quantitative evidence?

**Execution / reporting:** How explicit / systematic is the procedure for integrating the qualitative and quantitative syntheses? How transparently do the authors of each review report the process of integration?

**Diversity of perspective:** In what ways has integrating different types of evidence into the review increased the diversity of perspectives included?

**Findings:** How informative / illuminating are the findings of the integrated evidence? How might this ‘mixed’ evidence support improved decision-making?
Thank you!
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