Synthesis of qualitative data

1st Oct 2013

What is qualitative data?

- Not everything that counts can be counted

Questions for qualitative data

- What?
- How?
- Why?

- Important way to shape future research- data may reveal things researchers had not thought of
  - identify possible theories of change
  - suggest appropriate outcome measures

Strengths of qualitative research

- **Exploratory & Explanatory**
- **What?**
  - privileges view of the researched- no limits on response choice
  - rich description- range and nature of impacts/experience

  How & Why?
  - influence of meanings and values attached to an intervention and its associated impacts
  - shed light on potential mechanisms

Methods of qualitative research

- Interviews
  - Structured or Unstructured
- Focus groups
- Participant observation
- Ethnography

Additional sources of qualitative data

- Texts
  - Newspapers, policy documents, historical records, books etc etc
- Fieldnotes
- Audio
  - Music, radio, stories, etc
- Images
  - Photos, film, paintings etc

Qualitative research

- Qualitative research is not simply a 'non-quantitative' method of organising and interpreting data

- Operates with a different paradigm
  - Analytic induction rather than deductive
    - Developing theory & general principles from observations
    - Sets out terms and hypothesis to be tested, logic based on assumed facts
  - Interpretive: researcher is the tool and they influence the collection & interpretation of the data

- Different underlying philosophy has implications for approach to accumulation of knowledge & evidence

Alternative paradigm & approach to knowledge

- Inductive: Hypothesis generating (rather than hypothesis testing)

- Configurative rather than aggregative

Approaches to reviews

- Aggregative
  - Synthesis of similar data to test hypothesis
  - Deductive
  - Likened to adding stones to build a cairn

- Configurative
  - Synthesis of data with some level of commonality but incorporates high level of variation- used to generate hypothesis
  - Inductive
  - Likened to mosaic- contrasts create image

- Most reviews will involve a mix of approaches (especially of complex interventions)

Alternative paradigm & approach to knowledge

- Inductive: Hypothesis generating (rather than hypothesis testing)
- Configurative rather than aggregative
- Iterative: likely to require decisions during review process in response to what is emerging
  - Doesn't fit well with convention of sticking to a pre-published protocol
  - But should still try to set out as much as possible in advance
    - Keeps review & reviewers focussed
    - Limits potential for selective reporting of favourite topics
    - Progression of methods & decisions should still be recorded with rationale to maintain transparency

Can qualitative research be combined with the systematic review approach?

- Traditionally there has been resistance from both sides
  - **Hardline meta-analysts** who find it hard to see the point of qualitative data seen as unrepresentative and anecdotal
  - **Hardline qualitative researchers** wary of mixing paradigms

(Petticrew, 2006)

Issues include

- *A priori* protocol is deductive and hypothesis testing rather than iterative, inductive approach to develop theory
- Critical appraisal of qualitative methods: should you? Can you? How?
- Strictly empiricist or does the voice of the author/reviewer count?

Synthesis terminology

- Qualitative synthesis
  - Sometimes used to describe where there is no meta-analysis
  - Narrative synthesis
    - Results in a textual description and so may be called qualitative but not include synthesis of quantitative and/or qualitative data

- More accurate to refer to "synthesis of qualitative data"

Principles of systematic review

- Key elements of systematic review

Key elements of systematic review

- Develop a focussed question & inclusion criteria
  - Scope which is conceptually appropriate & manageable
- Identification & selection of eligible data/studies
- Assessment of validity of data
- Synthesis in light of quality of data

Preparing a review question

- Use qualitative data to look at:
  - Additional explanations for effects or absence of effects
    - e.g. acceptability, implementation, additional unintended impacts not assessed in quantitative studies
  - Short term outcomes which shed light on mechanisms & pathways to impacts

Place of qualitative data in your review

- May be part of a quantitative review
  - Mixed methods review which includes quantitative & qualitative data
    - Only use qualitative data which is collected as part of included quantitative study
    - Only use qualitative data that reports experiences from included interventions
    - May or may not decide to do additional searches for qualitative data
- May be stand alone review

Place of qualitative in a quantitative review

- **Inform:** refine review question, i.e. include appropriate outcomes
- **Enhance:** include qualitative data identified when searching for quantitative data, for example data supplementary to quantitative study which can explain issues of implementation etc
- **Extend:** search for qualitative data which adds to quantitative data available for review question
- **Supplement:** synthesise qualitative data to address questions beyond effectiveness, i.e. search for additional qualitative data

Cochrane Handbook

Preparing a review question: PICO(CS)?

- Where review is only including qualitative data PICOCS may not be easy to apply
  - Questions are not about effectiveness
  - May not be about an intervention but more about experience in a set of circumstances

- SPIDER is recommended for reviews which focus on qualitative questions
  - Cooke A, Smith D, Booth A. Beyond PICO: The SPIDER Tool for Qualitative Evidence Synthesis. *Qualitative Health Research* 2012, 22(10):1435-1443.

SPIDER/PICOCS

Sample	Population & Context
Phenomenon	Intervention
i	
Design	Comparison
Evaluation	Outcome
Research type	Study design

SPIDER (instead of PICOCS)

SPIDER	Justification
S – Sample **(instead of Population)**	Smaller groups of participants tend to be used in qualitative research than quantitative research, so this term was deemed more appropriate.
PI – Phenomenon of Interest **(instead of Intervention)**	Qualitative research aims to understand the how and why of certain behaviours, decisions, and individual experiences. Therefore, an intervention/ exposure per se is not always evident in qualitative research questions.
D – Design **(instead of Comparison)**	The theoretical framework used in qualitative research will determine the research method that is used. As inferential statistics are not used in qualitative research, details of the study design will help to make decisions about the robustness of the study and analysis. In addition, this might increase the detection of qualitative studies in the databases in which titles and abstracts are unstructured.
E – Evaluation **(instead of Outcomes)**	Qualitative research has the same end result as quantitative research methods: outcome measures. These differ depending on the research question and might contain more unobservable and subjective constructs when compared to quantitative research (e.g., attitudes and views and so forth), so evaluation was deemed more suitable.
R – Research type **(instead of Study design)**	Three research types could be searched for: qualitative, quantitative, and mixed methods.

Cooke et al, Qual Health Res 2012; 22: 1435

Key elements of systematic review

- Develop a focussed question & inclusion criteria
  - Scope which is conceptually appropriate & manageable

- Identification & selection of eligible data/studies
  - Record of search strategy to identify relevant data
  - Clear inclusion & exclusion criteria for selection of data

Searching for qualitative studies

- May need to consider different sources
  - Data published in reports & grey literature

- More difficult to develop specific searches for qualitative data
  - Poorly indexed in databases and unstructured abstracts
  - Methods terms inconsistently used
    - Even use of term "qualitative" is unlikely to be helpful, check thesaurus for the database
  - Titles of qualitative studies often "creative"
    - Use a quote e.g. "More than bricks and mortar"
  - Searching for a "phenomena of interest"
    - How people talk about their experience
    - Focus of relevant papers may not be clear and require examination of full text

Screening qualitative studies

- Still need to screen the studies using two independent reviewers

- Difficulties with having a sensitive search likely to result in large numbers of hits
  - Raise more questions during screening- things that look really interesting
  - Can be difficult to make decisions about relevance
    - e.g. Someone in this study does mention our "phenomena of interest"

Prioritising relevant studies

- May need to refine inclusion criteria to avoid being overloaded and keep review manageable
- What is the focus of the study?
- How relevant are the data?

Questions about relevance

- Preferably set these out in the protocol

- Focus of study
  - Clearly main purpose
  - Secondary focus
  - Borderline

- Issue/phenomena of interest e.g. What proportion of sample experience phenomena, such as unemployment
  - Total sample
  - Part of sample- majority, easy to distinguish
  - None or unclear how many or which reports relate to those who have experienced phenomena of interest

Questions about relevance

- Whose data are they? Whose views?
  - e.g. Stakeholders or recipients reporting impacts of an intervention
  - What are you most interested in?

- Setting
  - How relevant is setting of some studies to your review question?

Assessing relevance

- Often will be a judgement by reviewers

- Try to keep this as transparent as possible
  - Develop systematic criteria: record this with the rationale

- For example: Review of "return to work"
  - It became clear that studies undertaken in the USA frequently brought up factors that were not relevant to the study of return to work in the UK e.g. to do with medical insurance and health care.

  - Relevance criteria: Settings
  - A: UK
  - B: countries with developed welfare systems similar to the UK
  - C: for other (including USA because of differences in health insurance that were picked up on in retrieved papers)

Key elements of systematic review

- Develop a focussed question & inclusion criteria
  - Scope which is conceptually appropriate & manageable
- Identification & selection of eligible data/studies
- Assessment of validity of data
  - Validity, trustworthiness of data
  - Contested area
    - Should you?
    - Can you?
    - How to?

Assessing quality of qualitative data: should you?

- Some views that any assessment of "validity" imposes a positivist and reductionist framework on qualitative data
  - Likely to oppose use of qualitative data for
    - Generalising to other contexts & populations
    - Synthesis of qualitative data

- Need to recognise that there is variation in qualitative research (as in all research)
  - Useful to have some indication of the variation to assess relevance & value of data to your review question

Different terminology and concepts

- There is similarity in some concepts between the meanings of quantitative and qualitative terms- but terminology is often different

•Table below (from Lincoln and Guba, 1985)

	Quantitative Term	**Qualitative Term**
"Truth value"	Internal Validity	Credibility/trustworthiness
"Applicability"	External Validity or generalisibility	Transferability
"Consistency"	Reliability	Dependability
"Neutrality"	Objectivity	Confirmability

Assessing quality of qualitative data: can you?

- Relationship between conventional methods assessment *(high response and retention rates, appropriate comparison group etc)* are not clearly related to quality of interpretation of the data

  - A study may tick all the right methodological boxes
    - but is of little value because the authors had poor insights, interpretation and theoretical understandings

OR

  - ..an insightful author makes a useful contribution to theory despite methodological flaws in the study

- But how do you assess quality of interpretation?

Assessing quality of qualitative data: how do you?

- Many tools available

- Some very lengthy & difficult to interpret
  - Time consuming to do & requires skilled reviewers
  - Difficult to interpret: difficult to get agreement between reviewers
  - Use open ended questions: very difficult to summarise & make an overall assessment

- Doubt about advantage of structured assessment versus reviewers judgement

Critical appraisal tools available

For an up to date list of what's available see…

Hannes K. Chapter 4: Critical appraisal of qualitative research. In: Noyes J, Booth A, Hannes K, Harden A, Harris J, Lewin S, Lockwood C (editors), *Supplementary Guidance for Inclusion of Qualitative Research in Cochrane Systematic Reviews of Interventions*. Version 1 (updated August 2011). Cochrane Collaboration Qualitative Methods Group, 2011. Available from

http://cqrmg.cochrane.org/supplemental-handbook-guidance

Basic assessment of "trustworthiness"

- Assess clarity & appropriateness of reported methods
- Make a decision about what you consider to be essential elements and think about excluding these studies
  - i.e. If you really cant make out what the authors did-
  - Basic questions:
    - can you work out what the authors did- re data collection & analysis?
    - do you believe the authors interpretation?
- Minimise bias of assessment by using two independent reviewers to assess and compare assessments

Example checklist: Dixon-Woods 2004

- Are the research questions/aims specified?
- Are the research questions suited to qualitative enquiry?
- Are the following clearly described?
  - sampling
  - data collection
  - analysis
- Are the following appropriate to the research question?
  - sampling
  - data collection
  - analysis
- Are the claims made supported by sufficient evidence/data /quotes?
- Does the paper make a useful contribution to the review question? *(assessed in light of answers to previous questions)*

Key elements of systematic review

- Addresses a clearly defined question
- Selection
- Appraisal of data quality
- Data extraction & coding

Data extraction & coding

- Principles of systematic approach still apply
  - Aim to minimise bias of a single reviewers interpretation
  - Data should be extracted & coded by two independent reviewers
    - For preliminary synthesis preparation of summary of data by two reviewers may be sufficient
  - Extract (copy & paste text) into software
    - Qualitative software useful e.g. NVivo

Different types of data

- What are they?

- Should they be treated the same?

Different types of data

- Quotes from participants
- Authors description & interpretation
- Reviewers summary & interpretation
- Need to decide if and how you will treat these data

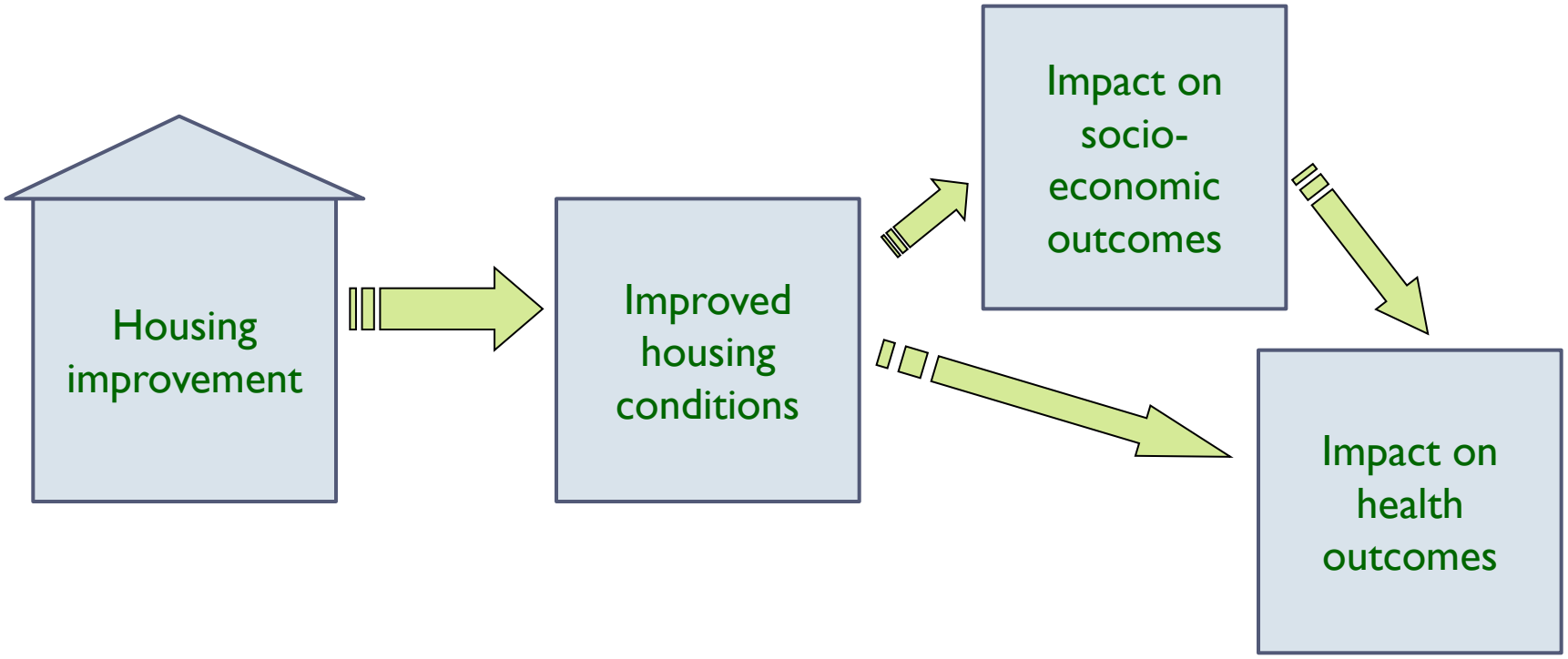
Different types of data

- Quotes from participants: ***first order*** *construct*
- Authors description & interpretation: ***second order*** *construct*
- Reviewers summary & interpretation: ***third order*** *construct*
- Different data should be treated differently
  - Needs to be clear in the synthesis

Coding qualitative data

- Read through extracted text and mark sections of text according to key themes
  - The review question will determine the key themes of interest but new themes are likely to emerge

Logic model shapes main themes of interest



pieces here. And you'll not need your glasses for this… (laughter)… health is where the home is, you know, and talking about how, you know, people's health seems to be, you know, to vary according to where they live and often Glasgow's been picked out in these reports, like for exampl here's something from the Evening Times, it's kind of referring to Gla- referring to one of these reports that I'm talking about here saying the city of the damned, about having the worst death rate and you know, there's just this sort of thing about you know, do you think where you live can affec your health?

N: It could, it could, if you're living in a bad environment. Now you see, when you're talking ab Glasgow, I was watching a thing on the television the other night about Leeds, and tha another big city and do you know, the way they were behaving there, if it was my childrer woulda kilt 'em. I would.

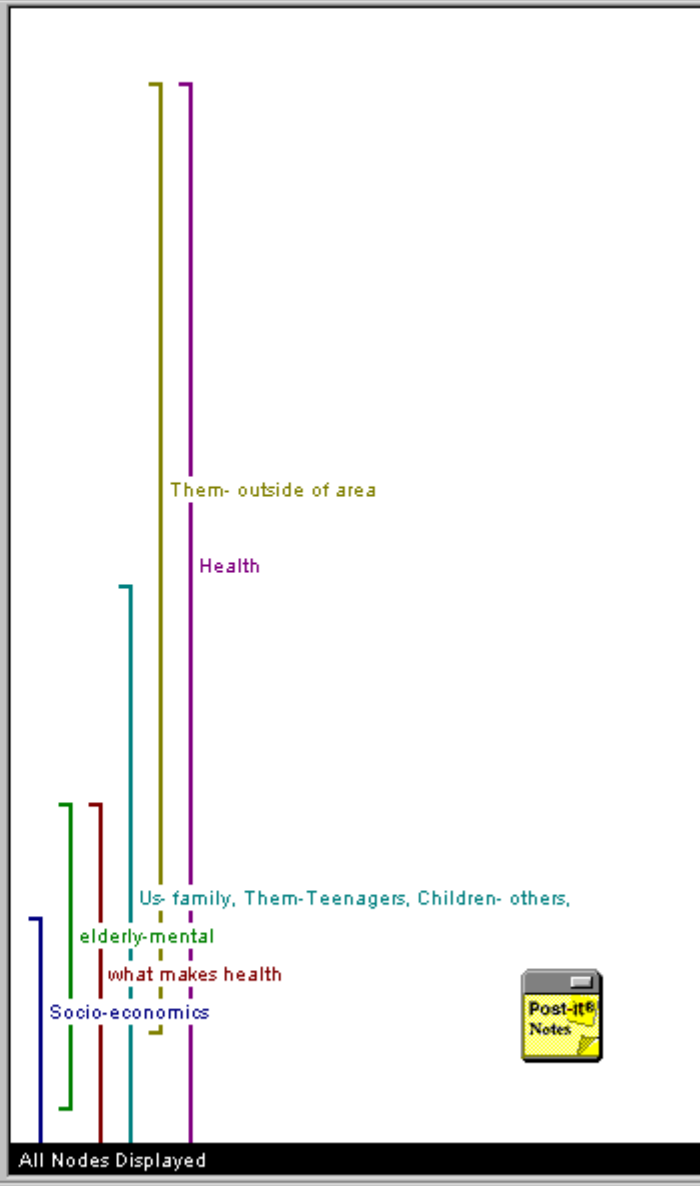
R: I think ?? (overtalk)

R: ?? I know it's not- I know that, but they condemn Glasgow for… and they condemn the kids Glasgow but when you see things on the television about other cities, they're a lot worse.

R: Well I'm just back fae Coventry and saw two boys who there passing a phone box wi' cigarette lighter in the coin bit, and my sister in law says to them 'get out a there what are y doing that for?'- 'it's got f-all to do wi' you'. That was two teenagers.

R: But I think, stress has a lot to do with your health. I think, I wouldnae like to bring up my k ?? no, no, honestly I wouldnae, would you honestly?

R: No, no.



Coding

- Coding & identification of themes should be conducted by two independent reviewers
- The two sets of coding and themes should be compared early on in the process to check for agreement
- If there is high level of agreement it may be appropriate to reduce the amount of double coding
  - Limit to one reviewer coding each study & second reviewer reading the study and noting themes and checking that there is agreement

Key elements of systematic review

- Addresses a clearly defined question
- Selection
- Appraisal of data quality
- Data extraction & coding
- **Synthesis**

Synthesis of qualitative data

- Key approaches/labels
  - Meta-ethnography
  - Meta-synthesis
  - Thematic synthesis
  - Meta-study
  - Integrative review

  - Much overlap in methods
  - Requires in-depth understanding of qualitative methods & underpinning rationale

Meta-ethnography

- A novel synthesis method aimed to uncover a new theory to explain the range of research findings encountered.
- The approach involves induction and interpretation in which separate parts are brought together to form a "whole" (i.e., looking for new theory or 'line of argument' to explain all the studies) so that the result is greater than the sum of its parts.
- The product is the translation of studies into one another, which encourages the researcher to understand and transfer ideas, concepts and metaphors across different studies.
- **Noblit & Hare, 1988**

Meta-synthesis

- A method developed in response to concerns about the relevance and utility of qualitative research, and involves combining separate elements to form a coherent whole using a process of logical deduction.
- Its aims are to portray an accurate interpretation of a phenomenon and to compare and contrast the constructs of individual studies to reach consensus on a new construction of that phenomenon. It involves: identifying findings, grouping findings into categories and grouping categories into synthesised findings.
- **Sandelowski M, 1997**

Thematic synthesis

- The most common method adopted within 'Narrative reviews" to produce a relatively rudimentary synthesis of findings across the included studies.
- It involves identifying prominent or recurring themes in the literature (largely shaped by research questions), and summarizing the findings of different studies under thematic headings using summary tables, which can inform a description of key points.
- **Mays, 2005**

Key components in narrative synthesis

- Develop a theoretical model of how interventions work- how, why and for whom (and when)
  - May be less specific than for a quantitative review but useful to guide scope of review and most relevant themes of interest
- Preliminary synthesis
- Explore relationships in the data
- Assess robustness of the synthesis
- *General principles of a good synthesis- whether narrative or statistical*
- *Should be considered iterative rather than linear*

Key components in narrative synthesis

- Develop a theoretical model of how interventions work- how, why and for whom (and when)
  - May be less specific than for a quantitative review but useful to guide scope of review and most relevant themes of interest
- Preliminary synthesis
  - Describe characteristics & key themes of individual studies
- Explore relationships in the data
  - Cross-study analysis: compare studies check for comparability, similarities, differences, and explanations for different findings to refine emerging theory
- Assess robustness of the synthesis
  - Consider the quality & "trustworthiness" of the synthesis
  - Does final synthesis prioritise best available evidence? What is missing from the review that might change your findings

Basic thematic analysis

- Two independent reviewers prepare written summary of the themes identified for each study- final summary is prepared reflecting areas of agreement
  - Agree in advance whether and how to use primary and secondary constructs
  - Reviewers need to honest about any concerns they have about the way some or all the data are reported/interpreted
    - Selective reporting of data and themes
    - Way authors have prioritise and interpreted data
    - If you have doubts consider excluding- but record this and document in your review

Reporting standards

Enhancing transparency in reporting the synthesis of qualitative research: the ENTREQ statement

Tong et al. BMC Medical Research Methodology 2012, 12:181 Page 4 of 8

http://www.biomedcentral.com/1471-2288/12/181

Guidance on reporting of qualitative reviews

- increasingly required by journals as a basic requirement before considering for publication
- useful to consider when writing the protocol

Summary: synthesis of qualitative data

- Subject of much debate: should you, can you, how do you?
- Requires input from experienced qualitative researcher
- Comprehensive identification of qualitative studies is not easy
- Methods of assessing study quality are not well developed but some assessment of clarity & appropriateness of methods is advised
- Range of methodological approaches
  - Considerable overlap
  - Basic thematic analysis is advised for novice reviewers