Developing a question for a systematic review

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Outline

- Developing questions which are feasible and useful
- Use of PICOCS
- PICOCS for complex interventions
- Refining review questions
- Use of logic models: workshop
Developing questions for systematic reviews

- Many reviews have been abandoned because the review question has not been well thought out.

- Valuable to invest time to ensure question is:
  - Useful
  - Makes sense
  - Focussed - like research question
  - Feasible to complete in timescale
  - Answerable
Developing questions for systematic reviews

- Establish:
  - What has already been done - avoid duplication: no existing systematic reviews on the topic - completed or ongoing.

- Useful: what is the priority for knowledge on this topic?
  - Nature of research - outcome evaluation, epidemiological studies
  - Will there be data available which can answer the question?
  - Is it conceptually useful to include studies from different contexts, populations, time points etc?

- Manageable: what is nature & volume of existing research evidence is likely to be available
Developing questions for systematic reviews

- Development of question is iterative
- Requires scoping searches and consulting with topic experts

Needs to respond to:
- Needs of evidence users and priority for knowledge
- Conceptually appropriate
- Be answerable - reflect a body of existing evidence (avoid empty reviews)
- Manageable in the timescale
Developing a systematic review question for a “what works” review: PICO(CS)

- Population
- Intervention
- Comparison
- Outcome

- Context
- Study design

- All need to be pre-specified in the review protocol
- Be clear and replicable to reader- explore your assumptions
Developing a systematic review question (PICOCSS)

- **Population**: age, socio-economic status, ethnicity, disease group
- **Intervention**
- **Comparison group**: placebo, normal care…
- **Outcome**: broad health, or specific respiratory function
- **Context**: country, rural/urban, hospital/primary care, deprived area
- **Study design**: RCTs, uncontrolled studies, qualitative data
Identify the PICOCs in this review
● PICOCs in reviews of complex interventions
Complex interventions & PICOCs

Population:

● Are you only interested in certain groups?
  ● Alcoholic dependant, young offenders

● Are there likely to be variations across populations
  ● which might have important influence on outcomes & potential effectiveness? Inequalities?
    ● Older people vulnerable to cold, young people & STDs
  ● which make some populations irrelevant?

● Consider ethnicity, age, gender, socio-economic status, education, occupation, religion
Complex interventions & PICOCs

Intervention:
- Are there different terms to describe the intervention?
- What is the potential scope of the intervention?
  - e.g. housing improvements
- What are the key components of interest?
- What is the potential for variation?
  - Intended variation & unintended
    - Tailored to context/individual or implementation failure
  - In what way & why?

- How much variation is manageable in your review?
Complex interventions & PICOCs

Comparison:

- What is the likely comparison?
  - Usual service provision - how much do you know about that?
  - No service provision
  - Is this a programme/policy that has been around for years, for example a welfare policy or emergency feeding clinics
    - Is it likely that there will be studies with comparisons?
      - What sort of comparisons?
Complex interventions & PICOCS

- Outcomes
Outcomes, impacts & effects

- **Outcome**: the measure used to assess
  - Income, HIV prevalence, hygiene practices

- **Impact/effect**: change in outcome
  - Change in: income, HIV prevalence, hygiene practices
Complex interventions & PICOCS

Outcome:

- What is the primary intended outcome of this intervention?

- What range of outcomes are of interest to review?
  - What is feasible to include? One domain e.g. respiratory outcomes?
  - Are there other likely outcomes?

- Are there other determinants of, or influences on these outcomes which should be considered?
  - What is known about these - what influences & how much?

- What is the timescale of outcomes of interest to the review and other outcomes?
  - If timescale long - how likely is it that studies will have assessed this?
    - Should you consider looking at more immediate outcomes or proxy outcomes for main outcome?
Review outcomes: Primary & secondary

- **Primary/Secondary outcome for intervention**
  - Primary outcome: Key aim of intervention
  - Secondary outcome: Not key aim of intervention
- **Health impacts of social interventions**
  - Secondary: may be beneficial & desirable

- **Primary/Secondary outcome for review question**
  - Primary outcome: Key aim of review
  - Secondary outcome: Not key aim of review-
    - but may be important additional impacts, e.g. which may explain variation in primary outcome or act as intermediate outcome
    - may be proximal impacts which act as determinant of primary review outcome, e.g. socio-economic determinants of health
Define primary review outcome(s)

- Limit number of primary review outcomes to one?! 
  - Maybe different measures of same broad outcome domain 
    - Health
      - Self-reported health?
      - Validated measure e.g. SF-36?
      - Long term limiting illness?
      - How is your health compared to a year ago?
      - Parent reported for child?
    - Health service use
  - May need to define time point at which outcome is assessed? 
    - 1 month, 6 months, 1 year, 2 years...
  - What is useful, manageable and synthesisable?
Define key outcome(s) for the review

- Limit number of key outcomes - to one
  - Maybe different measures of same broad outcome
    - Respiratory health
      - Asthma
      - Wheeze at night
      - Wheeze when talking
      - Wheeze when doing exercise
      - Wheeze in the morning
      - Cough in the morning
      - Phlegm in the morning
      - Peak flow measures...
Define key outcome(s) for the review

- Sets clear inclusion criteria for review
  - Study which does not assess change in primary outcome is not included - even if very interesting and has many other outcomes reported in the review
  - Useful to keep a list of studies identified which have potentially useful evidence - mark in your database while screening

- Developing a review question is similar to developing a research question in primary research - needs to be well defined
  - But may not be possible to pre-empt all potential variants of PICOCS
    - Some changes to protocol may be required but need clear recording and discussion with review team
Selecting secondary review outcomes

- Prioritise secondary outcomes of most relevance to review purpose
  - Impacts associated with the intervention which may influence primary review outcome
  - Implementation

- Selecting too many can result in very time consuming data extraction and overwhelming amounts of complex data
- Tailor this to time allocated to review - easy to become overloaded with good intentions!
Complex interventions & PICOCs

Context:

- Are there particular contexts of interest/relevance to users of review?
  - Country/region/physical location (prison/schools), time period,

- Need to know if effectiveness varies by context, implementation etc.
  - Decide how much variation is essential, useful, & manageable
Complex interventions & PICOCES

- **Study design**
  - What type of research evidence or study design is:
    - Best to answer question of interest
    - Likely to be available
  - Systematic reviews can include any type of data or even theoretical literature
    - Not just randomised controlled trials
    - Can include qualitative & quantitative
What kind of questions can systematic reviews of interventions address?

- **What works?** Effectiveness reviews
  - Is it effective for achieving a specific outcome?
  - What is the size of effect?
  - Is it effective for achieving a specific outcome compared to existing service?
  - What type/range of effects does it have? Benefits & harms
  - Do the effects vary by population, context, details of the intervention? Impact on inequalities?
- How does it work?
- Is it worth the money?
- Acceptability and appropriateness to certain groups
Refining a review question

- Keeping it manageable

- Apparently simple questions can be very broad
  - What is the effect of the recession on health?
  - Interventions to promote social cohesion in sub-saharan Africa
Review questions: broad or narrow?

- Depend on evidence users needs
- What is available
- What makes sense
- Resources

- Broad reviews can become overwhelming
  - Volume of evidence to review
  - Complexity of the data - diversity of the PICO
  - Only for experienced reviewers
Focussing a review question

- Restrict aspects of the PICOCES
  - Population
  - Intervention
  - Comparison
  - Context/Timescale
  - Outcome
  - Study design
Focussing a review question

- Keep scope of question tight
  - For example, restrict:
    - Dates of searches e.g. 2005-2010
    - Country or language of publication
    - Population of interest
    - Range of sources searched e.g. Medline only
    - Randomised controlled trials
  - Justification on grounds of time should be balanced by what is useful and conceptually appropriate
Development of review questions

- **Health impacts of employment interventions**
  - Spent over 6 months trying to organise and becoming familiar with huge volume of literature

- Original question too big

- Question narrowed and refined to reflect feasible and conceptually appropriate question
  - What are the health impacts of work based interventions that impact on psycho-social work environment (ie demand, control and support outcomes)?
Use of logic models in systematic reviews
What is a logic model?

Different jargon used to describe the same thing

- Logic model
- Analytic framework
- Theory of change diagram
- Conceptual framework
- Concept map
- Map of pathways
- Mechanisms
- Influence diagram…etc etc etc

- Broadly- a diagram to visually represent key steps to an expected impact which incorporates key influences which need consideration
- Developed within the evaluation field but of use in systematic reviews of complex interventions
Why logic models?

Input ———> Output

- Interventions can be like black boxes
  - Often assumed that the intervention will lead to the intended outcome
  - But when evaluated this is not always the case - WHY?
How might neighbourhood regeneration impact on health?

What is it about this intervention that might improve health?
How might neighbourhood regeneration impact on health?

Also influence of contextual factors: economic, Political, social, etc.
Use of logic models to refine questions

- Help to map out hypothesis(es)/review question
  - Highlight assumptions in hypothesis

- Highlight complexity and potential for multiple questions
  - Range of potential PICOCS
  - Intermediate variables & confounders

- Identify priorities for review- set limits to PICOCS
  - Illustrate to review commissioners that review is unmanageable
  - Develop in discussion with stakeholders to promote useful reviews
Beware of spaghetti!
“When we understand the diagram we will have won the war”

- Spaghetti good way to highlight need to limit the review
Developing a theory: logic models useful to develop a theory or hypotheses

Key questions to shape theory of impacts of an intervention

- What sort of health outcomes are most likely?
  - For Who? When?

- Implementation of intervention: Did housing actually improve?

- Participation in intervention: Did people use warmth measures?

- What are potential unintended impacts of intervention?
  - Were there other changes to peoples lives and living conditions as a result of the housing improvement?
  - Might these additional changes impact on health or your key outcome?
Housing Vouchers: Mechanism of Action

Publicly funded tenant-based rental vouchers & allowances

Increase access to affordable housing with minimum health & safety standards

Household income spent on housing not greater than 30% (thus freeing income for necessities such as food, clothing, health care)

Reduce social isolation of poor families in neighborhoods of concentrated poverty

Access to private rental market housing in more affluent neighborhoods

Higher level & quality of public services, access to private goods & services, access to local jobs

Increase neighborhood safety & reduce physical disarray (e.g. crime, vandalism, exposures to toxins, or unsafe conditions)

Community health outcomes

Residential stability (fewer family moves, less crowded living conditions, less homelessness)

Improved physical & mental health status; lower risk of behavioral problems among youth, & of violence or injuries for all ages
Logic model workshop: your turn!

- Groups of 4-5
- Choose a review question
- Draw out a preliminary logic model
  - In your logic model consider and map the following:
    - potential elements of the intervention
    - key outcomes of interest - may be one or more
    - important contextual influences on the intervention AND the outcome of interest
    - list other outcomes which might be of interest
    - the potential for differential effects across different population groups
- No holds barred! (don’t worry about spaghetti)
- Use yellow stickies to help?
- Write down questions that arise
- Feedback
Impact of social interventions likely to be mediated by, implementation, context & behavioural mechanisms

Context:
- Economic
- Social
- Political
- Legal

Intervention:
Define this

Outcomes:
- Morbidity
- Mortality
- Empowerment
- Socio-economic status

Behavioural mechanisms:
Values, beliefs & experiences of target community

From Water & Sanitation review (3ie)
Key questions to shape theory of impacts of an intervention

- What is the intervention- and what are the potential different components?

- What sort of health outcomes (or key outcome of interest) are most likely?
  - For Who? When? What is the likely timescale of your key outcome?
  - Are there proxy outcomes which are highly linked to subsequent impact on key outcome? E.g. reduced smoking before seeing respiratory improvement or reduced lung cancer
  - What are other important and likely influences on key outcome of interest- context, influences on health behaviour etc?

- Implementation of intervention: Was the intervention implemented as intended?

- Participation in intervention: Did people use the intervention as intended?

- What are potential unintended impacts of intervention?
  - Are there additional possible/likely changes to peoples lives and living conditions as a result of the intervention?
  - Might these additional changes impact on health or your key outcome?