RR-CLaN

Rural Research Collaborative Learning Network

How to develop a research question

Wednesday 13 September 2023, 3:00-4:00pm AEST

Seminar presented by:

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Acknowledgement of Country

Please ask questions

Housekeeping

Keep your microphone on mute during the session

Introducing you to today's presenters

Professor Steven Kamper

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NSW GOVERNMENT
Nepean Blue Mountains Local Health District

THE UNIVERSITY OF SYDNEY

What is a good research question?

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Acknowledgement

- Dharug, Gundungurra, Wiradjuri peoples

1. Blue Mountains District Anzac Memorial Hospital
2. Hawkesbury District Health Service
3. Lithgow Hospital
4. Nepean Hospital
5. Portland Tabulam Health Centre
6. Springwood Hospital

1. Cranebrook Community Health Centre
2. Katoomba Community Health Centre
3. Lawson Community Health Centre
4. Lemongrove Community Health Centre
5. Lithgow Community Health Centre
6. Penrith Community Health Centre
7. Springwood Community Health Centre
8. St Clair Community Health Centre
9. St Marys Community Health Centre

My perspective

- Background: trained as a physio, career in clinical research, increasingly interested in Evidence-based practice
- Job: split between University (pain research) and LHD (supporting and encouraging research among clinicians)
- View: research can be employed as a tool to generate information to inform health service decisions
  - Research embedded in health service
  - Clinicians/health services 'own' the projects, researchers have a technical, support role
  - I consider research and QI the same thing

Kamper SJ. Engaging with research: Linking evidence with practice. *JOSPT* 2018;48(6):512

Before we get into it

- Think about a problem you have at work
  - something that if resolved would mean your patients get better care
- What piece of research might help you solve that problem?
  - could be at any stage: understanding the problem, designing a solution, testing a solution, evaluating a practice change

What is your research question?

Agenda

- What is research?
- What a good research question looks like
- Types of research questions
- How the research question informs study design
- Questions/Discussion

Myths	Facts
1. Research is all about statistics	1. Research is all about good questions
2. Research is only worth doing if published	2. Research is worth doing if it has an impact (knowledge, health, practice, cost)
3. Research and practice live in separate worlds	3. Research and practice will be as integrated as we make it

What is research?

- "*a series of steps used to collect and analyse information to increase our understanding of a topic or issue*" Cresswell 2008

1. Pose a question
2. Collect and analyse data
3. Present an answer

- A research study is just a machine to answer a question in as unbiased a way as possible (generate useful information)

Aim of embedded research*

Generate useful information to help solve a problem or evaluate a service

Useful: reliable, unbiased, trustworthy

Other reasons: publication, grant, business case, demonstrate service improvement activity, something interesting to do…

*All the stuff about research questions applies to QI projects too

Why is Steve so hung up on questions?

If you don't start with a good question, everything you do afterwards is a waste of time

- The information you generate will not meet your needs
- Other people who read about what you've done won't be able to interpret and use the information

Kamper SJ. Asking a question: Linking evidence with practice. *JOSPT* 2018;48:596

That's a good question

Bad question = bad study

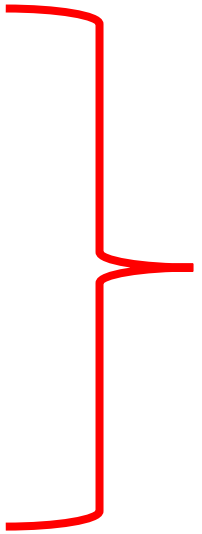
- A good research question:
  - Specific, focused
  - Clear
  - Answerable
  - Relevant / important

Features of a good question

- Specific, focused
  - Is there just one question?
  - Is the meaning of all the words unambiguous?
    - (‘~~*understand*~~’, ‘~~*look for*~~’, ‘~~*explore*~~’)
- Clear
  - Would your partner/parent/friend understand what you are doing?
- Answerable
  - Can you measure what you need to measure?
- Relevant / important
  - What will you do with the information? (so what?)

Functions of the question

- Forces the researcher to clarify thoughts and hypotheses
- Establishes the scope of the study
- Determines the study design
  - who and how to recruit
  - type and timing of data collection
  - analysis methods
  - presentation of results
  - interpretation / conclusions



You cannot design your project without a good question

Types of questions

1. Descriptive
   - What does the 'landscape' look like?
2. Predictive
   - What will happen in the future?
3. Causal
   - Does X cause Y?

Kamper SJ. Types of research question: Descriptive, predictive, or causal. *JOSPT* 2020;50:468

- Everyone wants to do 3
- Most of the time only 1 is feasible
- 2 is harder than you think

Research questions

- Prevalence / Incidence
- Diagnostic test accuracy
- Measurement properties
- Experiences or preferences
- Prediction models
- Risk/Prognostic factors
- Treatment effectiveness
- Treatment targets

Descriptive

Predictive

Causal

Your question

- Go back to the question you wrote down earlier, is it:
  - Specific, focused
  - Clear
  - Answerable
  - Relevant / important

- What type of question is it?

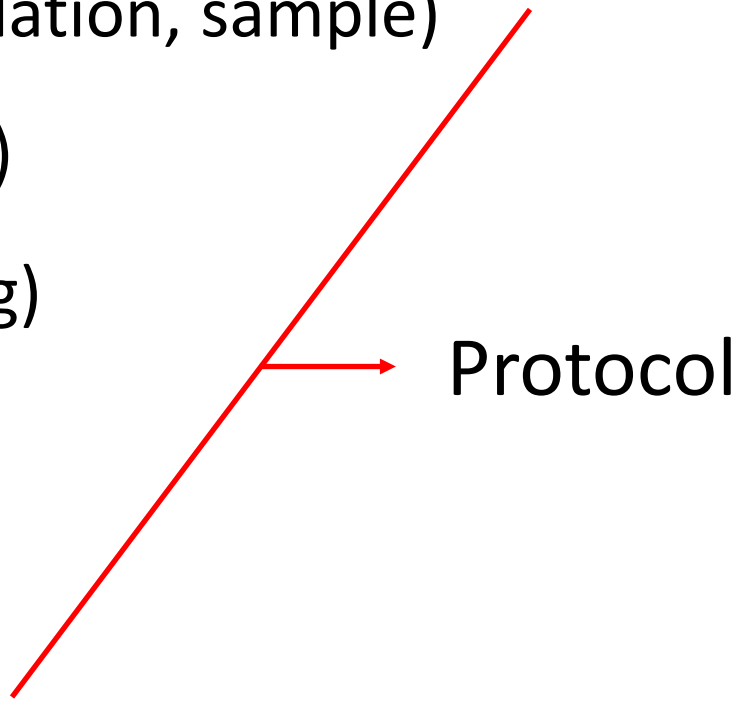
Question Type ⟶ Study Design

What do I mean by study design?

A research study is just a machine to answer a question in as unbiased a way as possible (generate useful information)

Components of Study Design

- Study design
  - Who you will collect data from (population, sample)
  - What data you will collect (outcomes)
  - When you will collect the data (timing)
  - How you will analyse the data
  - (Manipulation of interventions)



Research question ⟶ Study Design

- Prevalence → population survey
- Risk → longitudinal (case-control)
- Diagnosis → cross-sectional study
- Prognosis → longitudinal cohort
- Treatment effectiveness → RCT (controlled study)
  - subgroups, mechanisms, cost effectiveness
- Experiences → qualitative interviews

- Statistical analysis

A few considerations

- Your first go at a question is probably too vague and too broad (ie. more than 1 question)
  - Defining a question is a skill
- Useful questions can often be answered with data that is already available or simple surveys (especially important for embedded research)
- Data analysis is usually simpler than you think (but that will only become clear when the question is clear)
- Before you talk to people about your study, talk to them about your question – don't do it on your own

Final word

- Ultimately the goal of research/QI is to generate information related to a practice-relevant question:

the better the question is specified,

the more robust the design,

the better the quality of the data,

the stronger the analysis:

the more reliable the answer to the question

Thank you

Questions and discussion

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