

Climbing up the hierarchy

# Case study research for implementation science

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# TRIPLE C

a methodological study about case study, context and complex health interventions

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Research  
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**PRIMARY CARE**  
HEALTH SCIENCES

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The views expressed are those of the author(s) and not necessarily those of the MRC or UKRI.

The TRIPLE C review is registered on [\*\*PROSPERO\*\*](#).

The TRIPLE C reporting guideline under development is now live in the EQUATOR Network website. You can visit it [\*\*here\*\*](#).

We are thankful to Delphi participants and workshop attendees for their contribution.

# Study team



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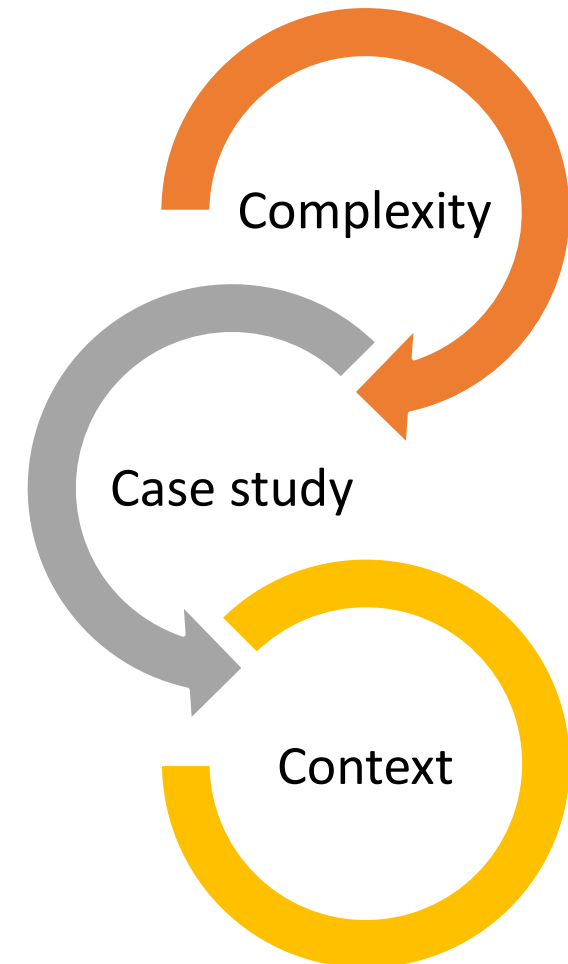


Jamie Murdoch



# What does TRIPLE C involve?



- Meta-narrative literature review on the 3Cs
- 2 smaller literature reviews: QCA + case studies of health inequalities
- Feeding into development and 'testing' of reporting principles and guidance:
  - Delphi panel
  - Interviews
  - Project workshop



Opinion | [Open Access](#) | Published: 10 November 2020

## Case study research for better evaluations of complex interventions

BMC Medical Research Methodology

Sara Paparini , Judith Green , Benjamin Hanckel & Sara Shaw 

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Sara Paparini, Chrysanthi Papoukidi, E. Shaw 

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### BMC Public Health

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### The use of Qualitative methods to address causality in complex interventions: a review of research on the use of Qualitative Comparative Analysis

Benjamin Hanckel, Mark Petticrew, James Thomas, Sara Paparini & Sara Shaw

*BMC Public Health* **21**, Article number: 877 (2022) | **8840** Accesses | **16** Citations | **32** Altmetric

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### Case study research and causal inference

Judith Green , Benjamin Hanckel, Mark Petticrew, Sara Paparini & Sara Shaw

*BMC Medical Research Methodology* **22**, Article number: 307 (2022) | [Cite this article](#)

**10** Altmetric | [Metrics](#)

#### TRIPLE C Reporting Principles: for Case study evaluations of the role of Context in Complex interventions in health systems and public health

Funded by the MRC, the [TRIPLE C \(3C\) study](#) aims to develop guidance and reporting principles for case study research into the influence of context on complex health interventions.

The first stage of the study was a [systematic, meta-narrative review](#) of the literature on case study research methods. We conducted a second review on [the use of Qualitative Comparative Analysis](#) to address causality in complex systems. The second stage, informed by findings from the reviews, combined with a Delphi survey, involved developing reporting principles. These have been agreed by the Delphi panel of experts and are set out below.

#### List of items to inform reporting a case study of a complex intervention

TITLE	
1.	Is the term 'case study' used in the title and/or subtitle, index, key words, or abstract?
ABSTRACT	
2.	In the abstract or summary, have the authors included brief details on: the policy, programme, intervention or initiative under evaluation; programme setting; purpose of the case study; case study question(s) and/or objective(s); case study strategy; data collection, documentation and analysis methods; key findings and conclusions?
INTRODUCTION	
3.	Terminology Have the researchers described how they are using key terms related to case, context and complexity/complex intervention in their study, e.g. by including definitions, descriptions or examples? If no descriptions are provided, have the authors provided their reasons for



# Complex interventions and complexity thinking

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<i>Simple: Following a recipe</i>	<i>Complicated: Sending a rocket to the moon</i>	<i>Complex: Raising a child</i>
The recipe is essential	Formulae are critical and necessary	Formulae have a limited application
Recipes are tested to assure easy replication	Sending one rocket to the moon increases assurance that the next will be OK	Raising one child provides experience but no assurance of success with the next
No particular expertise is required but cooking expertise increases success rate	High levels of expertise in a variety of fields are necessary for success	Expertise can contribute but is neither necessary nor sufficient to assure success
Recipes produce standardized products	Rockets are similar in critical ways	Every child is unique and must be understood as an individual
The best recipes give good results every time	There is a high degree of certainty of outcome	Uncertainty of outcome remains
Optimistic approach to problem-solving	Optimistic approach to problem-solving	Optimistic approach to problem-solving

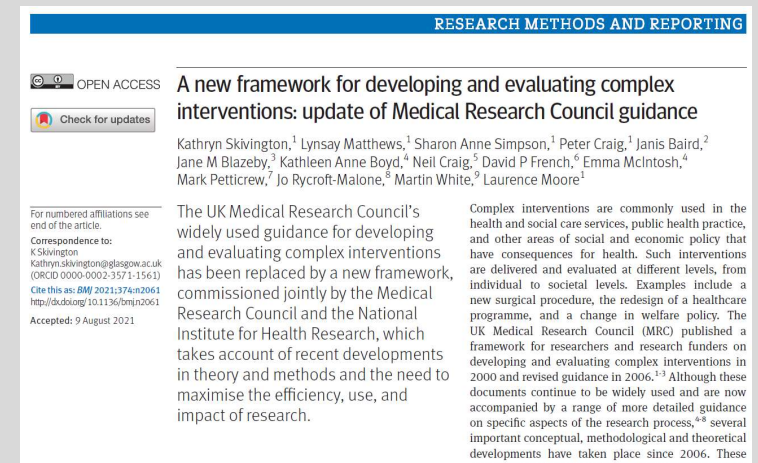
Straightforward, predictable, few components

Multiple interacting components or issues

Dynamic, unpredictable, difficult to disaggregate

# MRC framework for developing and evaluating complex interventions – 2021 update

- Properties of the intervention itself, such as the number of components involved
- Range of behaviours targeted
- Expertise and skills required by those delivering and receiving the intervention
- Number of groups, settings, or levels targeted
- Permitted level of flexibility of the intervention or its components
- *Interactions between the intervention and its context*  
→ *complex adaptive systems*



(Skivington et al 2008)

Am J Community Psychol (2009) 43:267–276  
DOI 10.1007/s10464-009-9229-9

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ORIGINAL PAPER

## **Theorising Interventions as Events in Systems**

**Penelope Hawe · Alan Shiell · Therese Riley**

Intervention is an event in a [complex] system. Success is based on the extent to which dynamic properties of the system can be harnessed.

## So what is complexity?

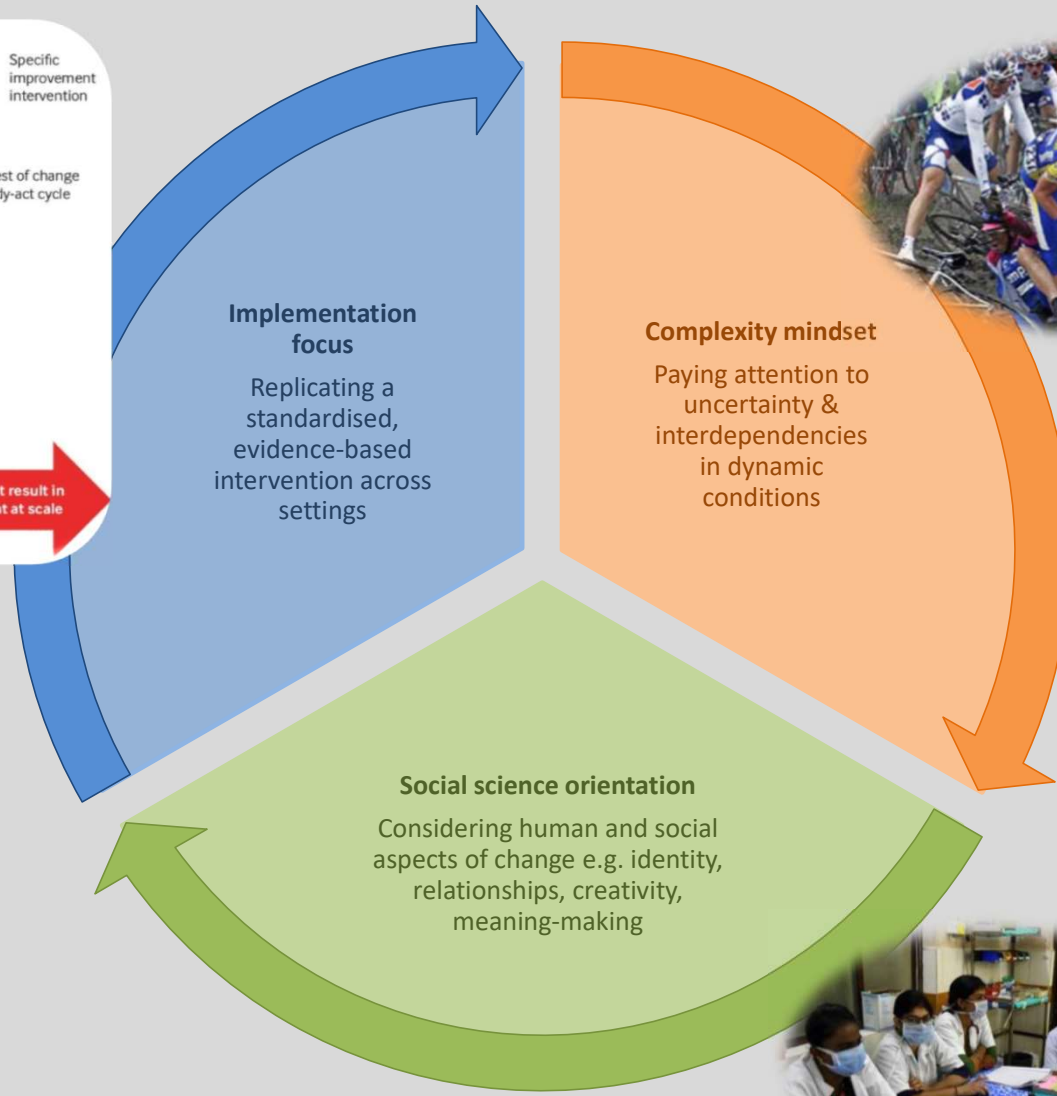
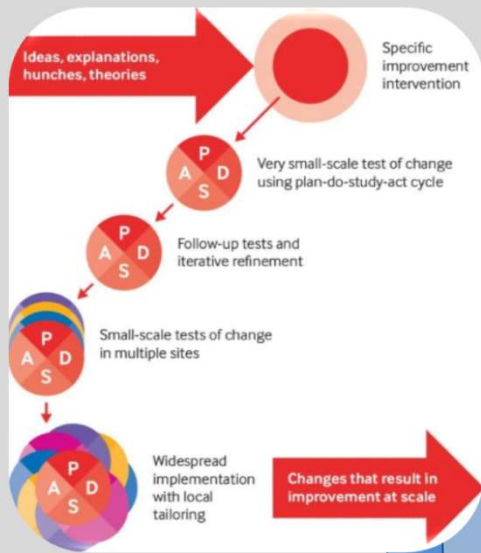
'Things add up *and* they don't. They flow in linear time *and* they don't. And they exist within a single space *and* escape from it. That which is complex cannot be pinned down. To pin it down is to lose it.'

(Mol and Law, 2002, p. 20)

# Studying complexity

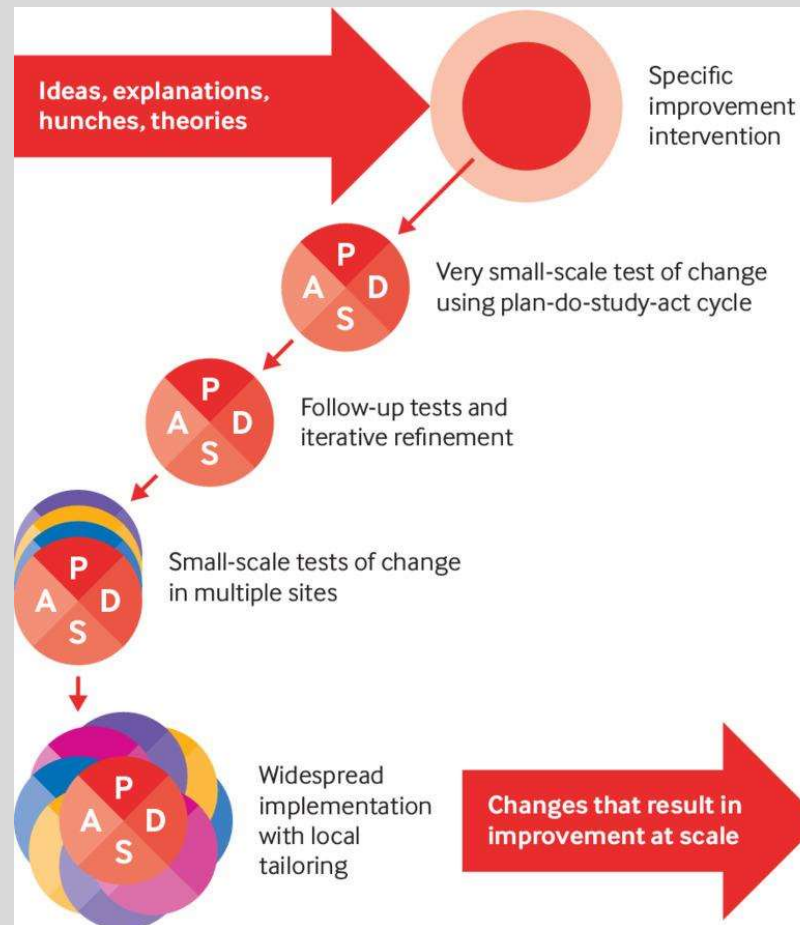
	Traditional approach	New paradigm (complexity-informed) approach
Goal of research	Establishing the truth, universal and enduring; finding solutions to well-defined problems	Exploring tensions; generating insights and wisdom; exposing multiple perspectives; viewing complex systems as moving targets
Assumed model of causality	Linear, cause-and-effect causality (perhaps incorporating mediators and moderators)	Emergent causality: multiple interacting influences account for a particular outcome but none can be said to have a fixed 'effect size'
Typical format of research question	"What is the effect size of the intervention on the predefined outcome, and is it statistically significant?"	"What combination of influences has generated this phenomenon? What does the intervention of interest contribute? What happens to the system and its actors if we intervene in a particular way? What are the unintended consequences elsewhere in the system?"
Mode of representation	Attempt to represent research in one authoritative voice	Attempt to illustrate the plurality of voices inherent in the research and phenomena under study
Good research is characterised by	Methodological 'rigour', i.e. strict application of structured and standardised design, conventional approaches to generalisability and validity	Strong theory, flexible methods, pragmatic adaptation to emerging circumstances, contribution to generative learning and theoretical transferability
Purpose of theorising	Disjunctive: simplification and abstraction; breaking problems down into analysable parts	Conjunctive: drawing parts of the problem together to produce a rich, nuanced picture of what is going on and why
Approach to data	Research should continue until data collection is complete	Data will never be complete or perfect; decisions often need to be made in situations of incomplete or contested data
Analytic focus	Dualisms: A versus B; influence of X on Y	Dualities: inter-relationships and dynamic tensions between A, B, C and other emergent aspects

Greenhalgh, T., Papoutsis, C. Studying complexity in health services research: desperately seeking an overdue paradigm shift. *BMC Med* **16**, 95 (2018). <https://doi.org/10.1186/s12916-018-1089-4>



**Implementation science:**  
Replicating a standardised,  
evidence-based intervention  
across settings

*Focus on 'core intervention'*



**Social aspects:**  
Considering human and social aspects of change e.g. identity, relationships, creativity, meaning-making



*Focus on people*



**Complexity:**  
Paying attention to uncertainties and interdependencies as programmes unfold in dynamic conditions



*Focus on the system*



**Table 1** Properties and examples of complex adaptive systems

System properties	Example
<b>Emergence</b>	
Complex systems have emergent, often unanticipated, properties that are a feature of the system as a whole	Group based interventions that target young people at risk could be undermined by the emergence of new social relationships among the group that increase members' exposure to risk behaviours, while reducing their contact with other young people less tolerant of risk taking <sup>24</sup>
<b>Feedback</b>	
Where one change reinforces, promotes, balances, or diminishes another	A smoking ban in public places reduces the visibility and convenience of smoking; fewer young people start smoking, further reducing its visibility, in a reinforcing loop <sup>22</sup>
<b>Adaptation</b>	
Change of system behaviour in response to an intervention	Retailers adapted to the ban on multi-buy discounts by discounting individual alcohol products, offering them at the same price individually as they would have been if part of a multi-buy offer <sup>25</sup>
<b>Self-organisation</b>	
Order arising from spontaneous local interaction rather than a preconceived plan or external control	Recognising that individual treatment did not address some social aspects of alcohol dependency, recovering drinkers self-organised to form Alcoholics Anonymous

(Skivington et al 2008)

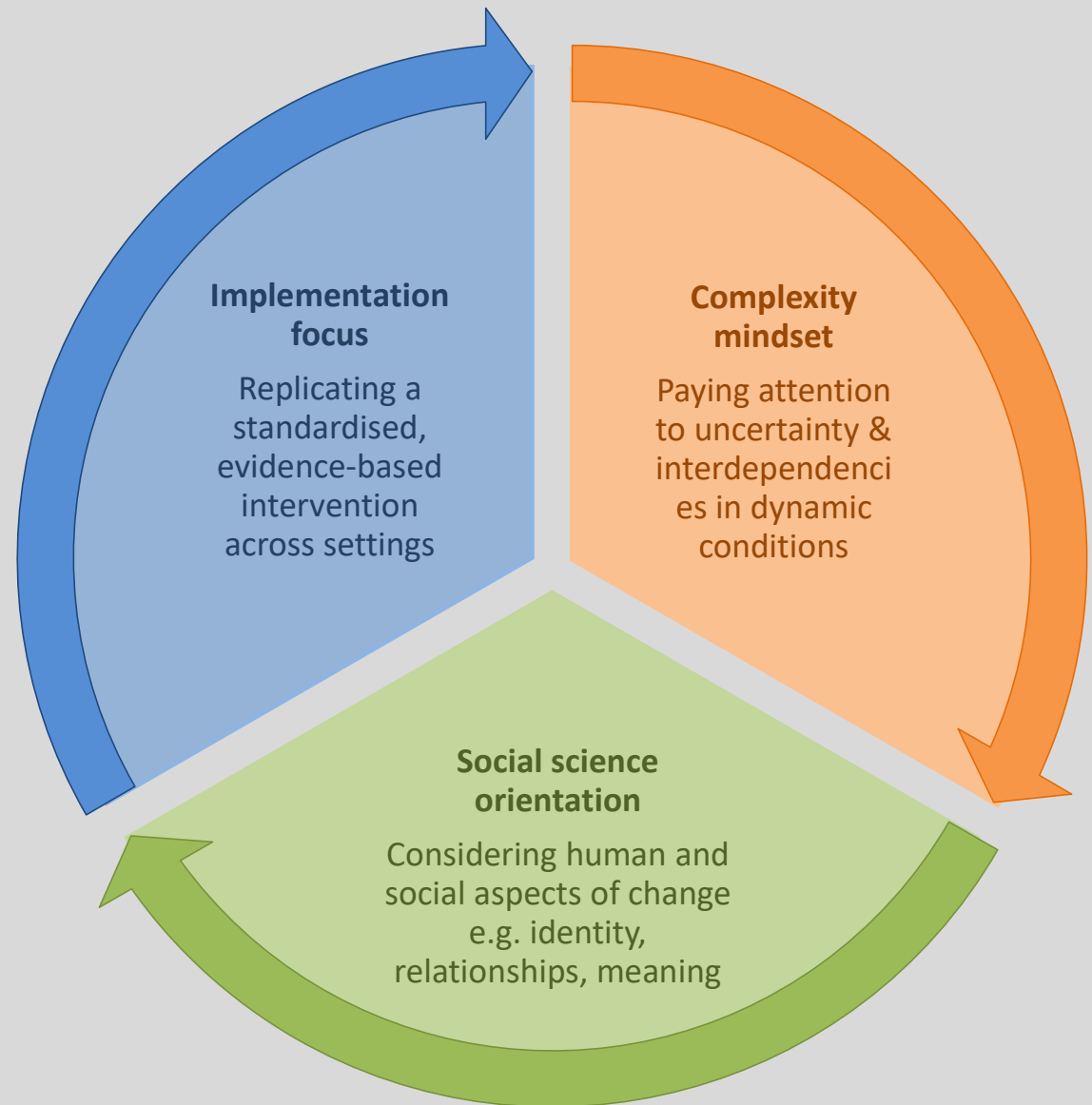
‘Complexity-informed thinking will not provide a simple fix for the inherent tensions and paradoxes in contemporary health systems, but it will allow us to focus on – and begin to research – uncomfortable knowledge, to negotiate good compromises and to embrace creative, reflexive and collaborative ways of working and thinking’

(Greenhalgh and Papoutsi 2018)

## Activity (10')

Discuss in groups:

- Which of these ways of thinking better reflects how you approach change?
- What could you do differently or more of?



## References

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# **CASE STUDY RESEARCH & EVALUATION**

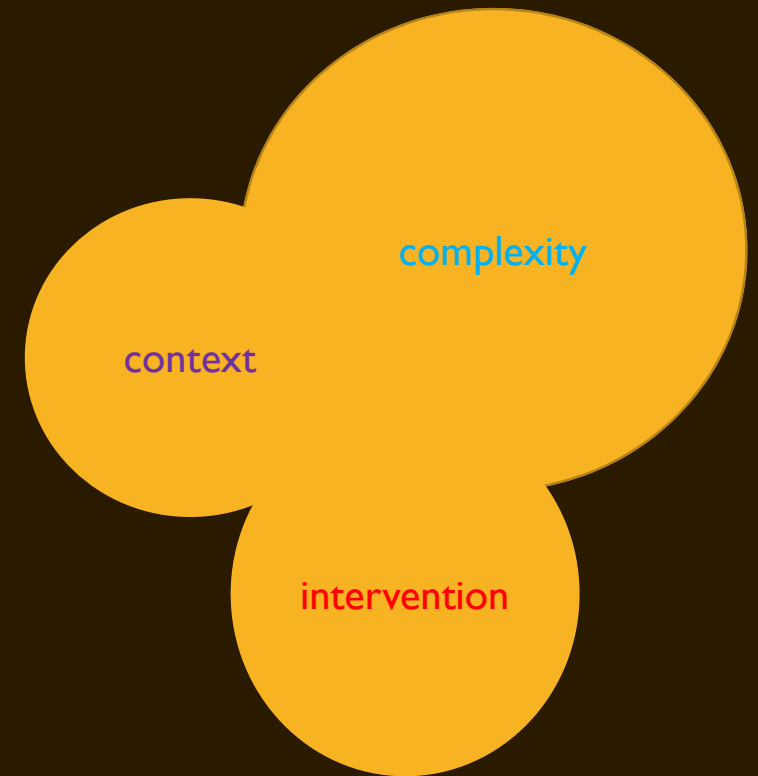
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## THREE BIG CONCEPTS



# THE EXPERIMENTAL APPROACH

- Intervention and context are separate
- Context can be 'controlled for'
- So that we can isolate:
  - variables of interest
  - components of the intervention
  - the magnitude of their effect on the outcomes of interest
  - a general 'law' of how this happens

SO: we can replicate these effects in other sites/ places/ contexts/ populations...



Randomised control trial (treatment v non-treatment or 'control' group)

# NATURALISTIC APPROACH

- Studying a phenomena in its 'naturally occurring' or 'real-world' context
- Intervention and context are inseparable in reality (and change each other)
- Evaluation is interested in the sense-making and experiences of participants ('multiple realities')
- The evaluator offers an additional interpretation

SO: the evaluation audience can make a decision about what they need to do in their *particular* circumstance



A 'case study' evaluation



**“REALITY IS A  
NETWORK OF  
GRANULAR  
EVENTS” (1)**

**(PHOTO BY DR G. GREENBERG)**



## THE IMPORTANCE OF NARRATIVE

Bringing together elements to paint a picture of what happened

‘Suggesting rather than proving complex chains of causation’ <sup>(ii)</sup>

Evaluation audience can look for a resemblance to their ‘contexts’

Important to be reflexive about how we ‘invoke’ context and for what purpose

# REMINDER: APPROACH V METHOD

- Experimental and naturalistic *approaches* rather than *methods*
- Qualitative and quantitative methods can be used
- Qualitative and quantitative data can tell stories!

# CASE-BASED RESEARCH



- Many forms of case-based research:
  - Learning case study
  - Clinical case report
  - Anthropological case studies
  - Case study evaluation
- The importance of the ‘case’
- ‘One among others’ (iii)

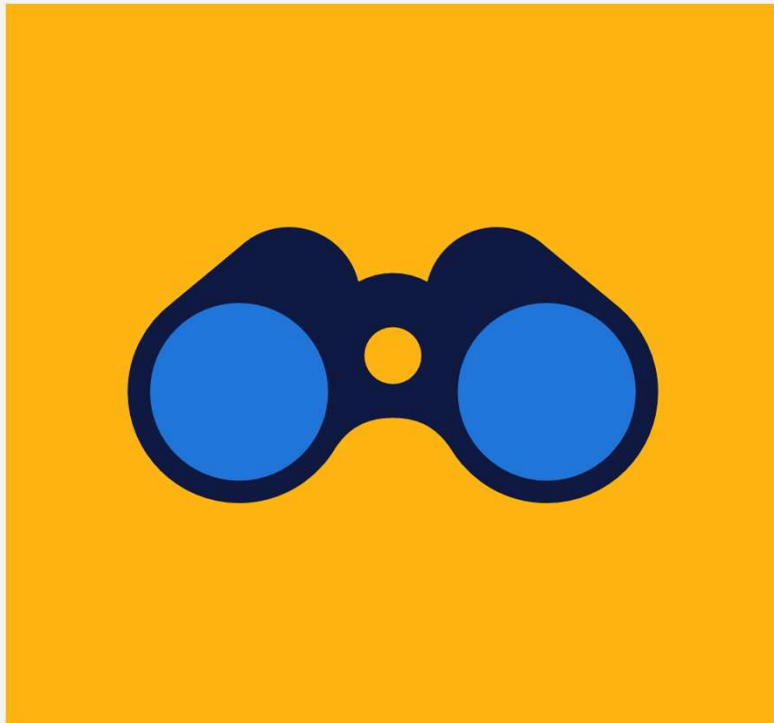
# WHAT IS A CASE STUDY EVALUATION?

A CASE STUDY IS: a research **approach** based on the in-depth explorations of complex phenomena in their natural, or real-life, contexts '*to elucidate features of a larger class of similar phenomena*' (iv)

A CASE STUDY EVALUATION IS: the investigation of a particular program, project or service using a case study approach [e.g. in health research, the evaluation of an intervention and its translation]

OFTEN CONFUSED WITH: an illustration of something

COMMONLY USING: both quantitative and qualitative methods of data collection



**WHAT MIGHT A  
CASE STUDY  
LOOK LIKE?  
HOW MANY KINDS  
ARE THERE?  
HOW DO WE  
CONDUCT ONE?  
WHO IS IT FOR?  
HOW LONG DOES  
IT TAKE?  
WHAT CAN IT DO?  
WHAT CAN'T IT  
DO?**



## A BIT OF A MAZE...

There are many (*many, many*):

Definitions of case study

Epistemological positions

Disciplines involved

Types (and typologies)

Empirical applications

Methodological debates

Case study designs

**EMBRACING PLURALITY!!**

# SOME COMMON CHARACTERISTICS

- Focusing on a particular 'case' (e.g. a hospital, a network of hospitals, a service within/across hospitals, an hospital staff group...)
- Studying that case in *depth* (time, data)
- Paying attention to context(s) and relationships
- 'Triangulating' multiple data collection strategies (e.g. observation, surveys, interviews, documents, audit data)
- Conducting analysis appropriate to the design
- Through a theoretical framework (a priori, emergent)
- Offering suggestions of how the knowledge gained can be used by others

# WHICH CASE, WHICH CASE STUDY?

Cases can be:

- Critical (most likely to give you information you seek)
- Extreme (most '*dramatic*') (v)
- Typical (average, most common)

Case studies can be:

- Instrumental (to gain knowledge about something else) (iii)
- Intrinsic (of interest in and of itself)
- Collective (a set of instrumental case studies)

# THE IMPORTANCE OF IMMERSION

- Case studies emerge from anthropology
- Observation and multiple materials are key
- Making sense of '*happenings in context*' (Stake, 1995)
- Reflecting on the field
- Juggling multiple perspectives of participants
- Taking a longitudinal view
- Bringing different data into the analysis
- Being reflexive about one's place in the process

# A PICTURE OF THE CASE

- The boundaries of the case
- The boundaries of context
- The case 'out there'
- The emergent case
- What is this case a case of?

# CASE REPORTING

- Important to tell a story of 'what happened' ('thick description')
- Complexity v simplification
- Consensus AND tensions!
- Consider ethics of reporting (confidentiality and balance of voices)
- Clarify researcher perspective and decisions
- What is the theoretical contribution? (e.g. testing, development...both?)
- Allow the reader to make judgement

# WHY USE CASE STUDY IN TRANSLATIONAL HEALTH RESEARCH?

## CASE STUDIES :

- enable dynamic understanding of complex challenges
- offer in-depth knowledge *of the particular*
- can be open to change and contingency
- emphasise participants' experiences and meanings
- provide information about causal mechanisms AND about 'the necessary and sufficient conditions' (aka: CONTEXTS) for intervention implementation

# CASE STUDY RESEARCH HAS THE POTENTIAL TO...



Improve the appropriateness of intervention development for specific contexts



Improve understanding of 'how' interventions work



Better understand how and why impacts vary across contexts and



Ensure reports of intervention studies are most useful for decision-makers and researchers



# REFERENCES

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