



Seminar series

Complexity in health, development,  
evaluation and research

Institute of Tropical Medicine, Antwerp



Report

# Quasi-experimental designs and complex causation

23 January 2017

Institute of Tropical Medicine, Antwerp



**UCL**  
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catholique  
de Louvain

**be** cause  
health  
Belgian Platform for  
International Health

Report written by Bruno Marchal, ITM, 23 January 2017

The seminar series is organised by the Department of Public Health, Institute of Tropical Medicine (ITM), in collaboration with the Health Department of the Belgian Development Agency (BTC), the Institut de recherche santé et société (Université Catholique de Louvain) and Be-cause health

## Introduction

This report provides an overview of the presentations and discussions of the seminar *Quasi-experimental designs and complex causation*, organised on 20 January 2017 at the Institute of Tropical Medicine, Antwerp.

This was the third seminar of the seminar series *Complexity in health, development, evaluation and research*, organised by the Department of Public Health, Institute of Tropical Medicine (ITM), with support of the Health Department of the Belgian Development Agency (BTC), the Institut de recherche santé et société (Université Catholique de Louvain), and Be-cause health.

## Background

Since a few years, *complexity* is rising on the agenda. The interest for new or better methods to deal with programmes that intervene in complex situations is growing in circles of health, international aid and development, as well as in the field of health policy and systems research. However, the uptake of complex systems thinking in actual practice has been slow. Sound applications of complex systems thinking to development and health remain scarce, both in the fields of planning, implementing, monitoring and evaluation of international aid programmes and in the field of research.

This slow uptake is arguably due to two reasons. First, there is still some conceptual confusion regarding the definition of 'complexity' and its key elements - for instance, what makes a problem or an intervention complex? Similar problems affect discussions on what constitutes good designs for evaluation or research of interventions in complex systems. Second, complexity theories present a major challenge to the linear paradigms (and the related preference for a sense of control and prediction) that are still dominant in medicine, public health and development.

## Objectives

With this series of seminars on complexity, we aim at contributing to the debate on how to better take on board complex systems thinking and to help shift the paradigm in the field of research and evaluation in health and development.

The start point for this third seminar is the current debate in realist evaluation circles whether it is possible to design Randomised Controlled Trials (RCTs) that remain true to the realist view on causation. It reflects the wider challenge of how to effectively combine qualitative and quantitative designs to gain a better understanding of complex causal chains.

## Programme

[Richard Byng](#), Professor in Primary Care Research, and his team from the Clinical Trials & Health Research - Translational & Stratified Medicine department of Plymouth University introduced in this seminar how they are currently developing an intervention study that combines a realist evaluation approach with a ‘traditional’ trial design. Within the project *Offenders with Common Mental Health Problems (ENGAGER 2)*, Richard is developing and evaluating an intervention for prison leavers, incorporating an exploratory RCT and a realist process evaluation

The seminar was divided in 3 sessions and engaged the participants in thinking about how such a hybrid study can be designed to allow dealing with complex causation.

Table 1 – Programme of the seminar

9h00	Registration Auditorium, ITM main building
09h15- 09h30	Welcome & Opening
09h30- 10h50	Session 1 - An interactive workshop helping participants place realist thinking in their own projects  Richard Byng and Cath Quinn
10h50- 11h10	Break
11h10- 12h00	Session 2 - <u>Intervention Theory Building.</u> Can theoretically informed realist approaches be successfully employed to synthesize multiple data sets and develop and evaluate a complex intervention?  Cath Quinn
12h00- 13h00	Session 3 - Methodological issues for a ‘realist’ trial of a complex intervention for complex needs  Richard Byng
13h00	Lunch

## Participants

This methodological seminar was well attended. More than 40 participants were present during the seminar, including staff and students of academic institutions (ITM, UA and IOB), Be-cause Health members, and NGOs, as well as three visiting professors from RDC.

## Summary of the sessions

### Opening and introduction

Prof. Bruno Marchal, head of the Health Services Organisation Unit welcomed everybody in the room and presented the background and the general aim of organizing a seminar series in complexity. He briefly introduced the objectives and programme of this seminar.

### Session 1 – An interactive workshop

Richard Byng and Cath Quinn opened the seminar with a short introduction to the Engager project, an intervention for prison leavers with common mental health problems (see <https://www.plymouth.ac.uk/research/primarycare/engager>).

They introduced the principles of realist evaluation by presenting realist evaluation as an intuitive way of seeing and analysing things. They stressed there are no recipes and fixed procedures and no absolute ways of doing realist research. Richard introduced the realist Health Services Research map, which they developed to make sense of their intervention and which was based on previous research. The key components of realist evaluation were explained using the example of the HSR map of the Engager intervention. Cath presented some Context-Mechanism-Outcome configurations drawn from the Engager project.

Interesting, Richard Byng discussed how mechanisms, traditionally defined by realists as ‘reasonings’ of actors in function of resources and opportunities provided by interventions can be looked at from cognitive sciences as also including automatic, intuitive responses by actors (cfr. Type 1 and 2 thinking - Kahneman: Thinking, fast and slow. 2011.)

The HSR map was used to do a small group exercise with the participants, whereby they were asked to consider a situation that might fit onto the map and to identify the resources brought by the intervention, the reasoning/automated responses being triggered, the outcomes of interest, the context influences and sequences of mechanisms. This was followed by a Q&A session.

### Session 2 – Intervention Theory Building. Can theoretically informed realist approaches be successfully employed to synthesize multiple data sets and develop and evaluate a complex intervention?

Cath Quinn asked the question whether and how theoretically informed realist approaches can be successfully employed to synthesize multiple data sets and develop and evaluate a complex intervention. She started with design issues surrounding so-called black box evaluation designs.

She then presented how through previous research projects the current programme theory of the project was developed, in two movements of synthesis. Many methods were combined in two stages of data collection: eliciting a causal model, literature reviews, exploratory case studies, interviews and testing of the intervention in pilot conditions. After each stage, a synthesis was made which led to a refined theory of how the intervention could be developed and how it could work. At this stage, the intervention is in its implementation phase.

She identified the following challenges:

- 1) Working with data produced from a range of ontological positions.
- 2) Progressively reducing our expansive focus while actively working against linear and reductive thinking.
- 3) Employing an explicit and inclusive decision making processes.

Cathy concluded that it is possible to design a realist RCT design.

### **Session 3 - Methodological issues for a 'realist' trial of a complex intervention for complex needs**

Richard Byng presented the intervention in terms of the participants and the needs for a flexible approach to counseling, which is the key characteristic of the Engager intervention, or in other words, a person- , not a disorder-focused intervention.

He presented potential mechanisms that are central to explaining the causation underlying the project, and how the logic model was summarising these assumptions.

He then went on explaining the trial design and the methodological challenges they encountered in terms of selecting the outcomes of interest, how to implement the intervention in practice and how to understand how the intervention works (or not).

He discussed in more detail the process evaluation component, which is running in parallel and in interaction with the trial. Two strategies are being considered: a mostly qualitative process study of the implementation, and a moderator-mediator regression analysis of the prison leavers' outcomes, combined with qualitative research.

This was followed by a lively Q&A session on whether the RCT design can pick up the interaction between context, actors and mechanisms, about the regression analysis and whether it would engage in sub-group analysis, about what the intervention is in its essence ('adaptive'), about the difference between mechanism and outcome, and what to do if the outcome of the trial is a zero result.

### **Closing remarks**

A word of thanks was given by Bruno Marchal to the speakers, the audience and the funders of this seminar (DGD, Be-cause health and the ITM).

## Annex - List of participants

First name	Last name	Organisation
Linda	Abboud	Antwerp University
Melanie	Bannister-Tyrrell	ITM
Ghislain	Bisimwa	Ecole Régionale de Santé Publique Bukavu
Jan	Boeynaems	ITM
Simon	Couvreur	University of Antwerp
Irith	De Baetselier	ITM
Jeroen	De Man	ITM
Maxim	De Soomer	University of Antwerp (student)
Pol	De Vos	ITM
Elise	De Vos	University of Antwerp
Tom	Decroo	ITM
Peter	Eerens	Living Health Systems
Charlotte	Gryseels	ITM
Tasnuva	Jannat	University of Antwerp
Jozef	Janssens	University of Antwerp
Vicky	Jespers	ITM
Carol	Kagia	Antwerp University
Guy	Kegels	ITM
Fulbert	Kwilu Nappa	Ecole de Santé Publique Kinshasa
Marie	Laga	ITM
Pauline	Lempens	ITM
Evy	Lenaerts	UA
Bruno	Marchal	ITM
Yoriko	Masunaga	ITM
Geneviève	Michaux	ITM
Philippe	Mulenga	ESP, Lubumbashi - PhD ITM
Yessika Adelwin	Natalia	University of Antwerp
Ariadna	Nebot	ITM
Christiana	Noestlinger	ITM
Marjan	Pirard	ITM
Raffaella	Ravinetto	ITM
Tim	Roosen	ITM
Nandini	Sarkar	ITM
Katja	Siling	ITM
Werner	Soors	ITM
Wim	Van Damme	ITM
Patrick	Van der Stuyft	ITM
Marlon	van Loo	University of Antwerp
Ann	Verlinden	ITM
Florian	Vogt	ITM
Evelyn	Waweru	ITM