Dynamics of Infectious Disease Spread and Health-related Behaviours - overview of workshop program

Main organiser: **Luc E. Coffeng**, MD PhD, Department of Public Health, Erasmus MC, University
(*expertise*) Medical Center Rotterdam, The Netherlands (*infectious disease epidemiology, mathematical modelling, individual-based modelling*)

Co-organisers: **Dr. Tessa Blanken**, Psychometrics, University of Amsterdam, The Netherlands
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Dr. Rick Quax, Complexity and Network Sciences, University of Amsterdam, The Netherlands (*network and complexity science*)

Workshop website @Lorentz Center

Associated DLF Talk at SPUI25 (in Dutch with English subtitles)

Workshop format

The workshop spans five days (9-13 May 2022) and will consist of a mix of plenary talks, interactive break-out sessions, and poster presentations. The program will start daily at 8:30am (9:30am on the first day) and finish at 5:00pm (4:00pm on the last day) with ample break time to have lunch and address other things like email. On Wednesday May 11th there will be an excursion and dinner after the workshop program.

May 9 (day 1): COVID-19 - Challenges and lessons learned

Objectives: (1) demarcate the workshop and the challenge that it aims to address, reflecting on COVID-19, (2) make an inventory of expertise present, (3) identify key questions and concepts and organise them into logical groups.
Main output: a list of key elements (behavioural and epidemiological) relevant for infectious disease transmission and control that operate in individuals, groups, and societies. List of volunteers who focus on particular aspects (e.g., impact on policy) throughout the workshop. Poster session initiated.

May 10 (day 2): Establishing a multi-domain causal loop diagram

Objectives: (1) identify how (logical groups of) key elements interact with one another, (2) identify the time scales on which key elements and links between them operate, (3) identify where and which disciplines overlap with regards to key elements and links between them, (4) start of rapid prototyping of potential ways to integrate concepts from different disciplines.
Main output: first version of causal loop diagram (CLD).

May 11 (day 3): Refining, annotating and deepening the causal loop diagram

Objectives: (1) continue identifying overlap between disciplines and how to integrate these, (2) rank elements in the CLD in terms of importance and determine which of them require more fine-graining or coarse-graining, (3) identify potential sources of data to inform qualification of (elements of) the CLD.
Main output: second version of CLD with annotation (fields, literature, data).

May 12 (day 4): Translating to computational frameworks

Objectives: (1) link elements of the CLD to (conceptual) models and techniques from specific fields, (2) identify potential sources of data to inform quantification of (elements of) the CLD, (3) explore how active inference might be used to simulate agency in individual-based models.
Main output: An overview of computational techniques and model innovations needed to capture the CLD.

May 13 (day 5): Workshop synthesis and future outlook

Objectives: (1) establish a list of research priorities (across and/or per discipline), (2) establish an outline of a white paper, building on the annotated CLD, (3) assign tasks for completion of the white paper and set up a communication framework for further collaboration after the workshop, (4) identify potential spin-off

initiatives (papers, research proposals) and interested partners/collaborators, (5) identify strategies to inform policy.
Main output: outline of white paper and inventory of tasks and further initiatives.