Logic model templates for systematic reviews of complex interventions

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Background
Complex interventions are commonly encountered in health services, public health and social welfare and present significant challenges when conducting systematic reviews and Health Technology Assessments (HTAs). Logic models, originally developed in the field of programme evaluation, can be useful at every stage of the process of a systematic review, from scoping to defining and conducting the review to communicating the results. While various templates of logic models for programme evaluations exist, no such templates have been developed for systematic reviews or HTAs.

Objectives
To develop two logic model templates for systematic reviews and HTAs of complex health interventions, focusing either on the underlying system or the processes leading from intervention to outcomes.

Methods
We conducted a review of the literature on complex interventions, as well as use of logic models in primary and secondary research. We examined existing templates for logic models, e.g., those of the Kellog Foundation1 and the U.S. Preventive Services Task Force2. In addition we searched The Cochrane Library for published reviews and protocols where authors made use of logic models. This assisted us in identifying key components for both logic model templates. Discussions with experts in the field and testing in systematic reviews of complex interventions are on-going.

Participants: targeted population/individuals.
Theory: body of implicit or explicit ideas on how an intervention works.
Components: multiple components comprising technology and infrastructure, education, and/or policy and regulation.
Execution: “prescription” of the intervention, e.g., dose, intensity, duration and timing.
Provider: characteristics of the individuals delivering the intervention.
Organisation and structure: networks, infrastructure, organisational culture of the organisation(s) delivering the intervention.
Setting: geographical and locational aspects.
Context: social, cultural, economic, epidemiological, ethical, legal and political aspects.

Preliminary results
A system-based logic model or conceptual framework (Figure 1) can be used to describe the system in which the interaction between the participants, the intervention and the context takes place. This logic model therefore aims to create an overview of the system.

A process-orientated logic model or analytic framework (Figure 2) can be used to explain the processes and causal pathways from the intervention to its multiple outcomes. This logic model therefore aims to explain how an intervention exerts its effect.

Both logic model templates may be applied in systematic reviews of effectiveness, systematic reviews of broader questions and health technology assessments (HTAs). When applying the logic model templates, one should start by considering the type of logic model that would be most suitable. This usually depends on both the intervention under consideration and the research question needing to be answered. In some instances, it might even be helpful to apply both logic models, by starting off with a model that depicts the system as a whole (to get everyone on the same page) and then focus in on one or several relevant pathways within the system.

Participants: targeted population/individuals.
Outcomes: implementation outcomes, e.g., participation, fidelity, reach, dose delivered and dose received, barriers experienced during implementation, contamination, experiences of participants and providers.
Behaviour outcomes: adherence or compliance, any other desired behavioural outcome.
Surrogate outcomes: direct, measurable, often short-term effects of an intervention.
Individual-level outcomes: mostly clinical outcomes, e.g., morbidity, mortality.
Population-level outcomes: impact on the community or population, e.g., incidence.
Non-health outcomes: broader outcomes not directly concerned with the health of an individual or population.

All outcomes may be:
• short-term, intermediate-term or long-term;
• positive/intended or negative/unintended;
• quantitative or qualitative.

Discussion and Conclusion
These templates are intended to encourage the use and facilitate the development of a logic model when synthesising evidence on complex interventions.

Development of a logic model is usually an iterative process, starting off with one of the templates and adapting and refining it to fit the specific intervention and research question until all systematic review authors agree on the final output.

There is no one right logic model. The choice of logic model is likely to influence the conduct as well as the outcomes of the systematic review or HTA. This issue will be further explored and the templates tested in a number of systematic reviews.

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