Using logic models in systematic reviews

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Conflict of interest/Acknowledgements

• My thinking around logic models was informed by:
  • Work done as part of the EU-funded Integrated health technology assessment for the evaluation of complex technologies (INTEGRATE-HTA) project
  • Discussions as part of the Learning Initiative for Experienced Authors (LIXA) of the Effective Health Care Research Consortium
  • Workshop conducted at the Global Evidence Summit in Cape Town, 2017
  • Own experience in conducting various systematic reviews

• The views presented are my own and do not necessarily represent the above collaborations.

• I have no other conflict of interests related to this presentation
Outline

• Terminology
• Using logic models in systematic reviews
• Approaches to logic modelling
• Limitations
• Examples
  • Added value of systematic reviews
• Group work: developing logic models
What is a logic model?

- Terminology differs
  - Broad vs narrow definition
- Inconsistency in the use of the term
- No standardized or comprehensive definition
- Key components of definition
  - Described as a visual representation (graphic)
  - Shows programme components (activities/outputs/outcomes)
  - Some reference to relationships
- Shows logic of chain of events/system

Wildschut LP. Theory-based evaluation, logic modelling and the experience of SA non-governmental organisations. Stellenbosch: Stellenbosch University; 2014.
What is a logic model?

“... a graphic description of a system ... designed to identify important elements and relationships within that system.”

Logic models

• Traditionally used in programme evaluation
• Relationships between inputs, activities, outputs, outcomes and impact
• Clarifies implicit/explicit theory of change
• Helps to explain assumptions to stakeholders
• Provides framework for planning, implementation and evaluation
• Increasingly used in research synthesis
• In systematic reviews, logic models are useful tools to:
  • Unpack complexity related to PICO
  • Make explicit assumptions about causal pathways
  • Describe interactions between intervention and system
Added value of logic models in systematic reviews

Scoping the review:
- Refining question
- Lumping vs. Splitting
- Identifying intervention components

Defining and conducting the review:
- Criteria for including studies
- Search strategy
- Subgroup analysis

Making the review relevant to policy and practice:
- Structuring reporting of results
- Interpreting results based on conceptual framework

Increased transparency

Logic models that help to conceptualise the review question

- Depict the system in which the interaction between the participants, the intervention, the outcomes and the context takes place
- Holistic perspective (bird’s eye view)
- Broad packages/approaches
- Useful for public health/health systems
- Conceptual framework
- System-based logic model
Logic models that help to understand the causal pathway

- To depict processes and causal pathways that lead from the intervention to its outcomes
- Focus on how the intervention operates
- Analytical framework
- Process-orientated logic model
Approaches to logic modelling

• Developed at protocol stage and
  • Fixed throughout review
  • Revised at the end of the review
  • Constantly revised

• Developed once the results of the review are known

• Can depend on
  • Scope of review (broad vs narrow question)
  • Type of evidence (quantitative vs qualitative)
  • Aim of review (theory testing vs theory generating)
Examples
Integrated models of care for diabetes and hypertension in low- and middle-income countries (LMICs): Protocol for a systematic review

Jeannine Uwimana Nicol¹⁺²⁺, Anke Rohwer¹, Taryn Young¹, Charlotte M Bavuma³ and Joerg J Meerhof⁴
Primary Health Care (PHC)

Integration of service delivery

Prevention - Partial
Diagnosis - Partial
Treatment - Partial

Full integration

Single health care professional (HCP)

Multi-disciplinary team

HCP 1, HCP 2, HCP 3, HCP 4

Diabetes/Hypertension
Other chronic condition e.g. HIV
Added value of logic model

• Conceptualising intervention
• Common understanding of intervention
  • Stakeholder engagement
• Informing subgroups and comparisons
• Review currently underway
RESEARCH ARTICLE

Being HIV positive and staying on antiretroviral therapy in Africa: A qualitative systematic review and theoretical model

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HIV positive test → Initiate ART → Remain in ART services on treatment

 Linkage → Retention-in-care → Adherence

**Influences:**

- **Political system:**
  - Criminalization of key populations
  - Immigration

- **Health system:**
  - Speed/ease of referral
  - Attitude healthcare provider/confidentiality
  - Accessibility of treatment services (time/place/cost)
  - Integration with other services
  - Skills of healthcare provider/continuity of care

- **Clinical:**
  - Being physically unwell
  - ART side-effects/formulation/pill burden

- **Economic:**
  - Financial: resources to attend clinic, food insecurity
  - Competing responsibilities: work/clinic attendance

- **Social:**
  - Family/community support/stigma/socio-cultural norms
  - Instability and chaotic lifestyle: sex-worker; substance abuse; mental illness; prisoner; intimate partner violence

- **Individual (or care-giver):**
  - Inherent health seeking behavior/self-efficacy
  - Acceptance of result
  - Fears/beliefs/knowledge
  - Disclosure status/perceived stigma
  - Life stage (adolescents, youth)
Added value of logic model

- 1st model based on existing literature about barriers and facilitators, linear
- Provided framework for data collection
- Realised that linear model was not useful
- After thematic synthesis developed new model based on themes
Self-management interventions for adolescents living with HIV: protocol for a systematic review

Talitha Crowley, Anke Rohwer

Citation

Review question
What is the effectiveness of self-management interventions for improving the health-related outcomes of adolescents living with HIV (ALHIV)?
Added value of logic model

• Combination of system-based and process orientated logic model
  • Conceptualising intervention
  • Understanding causal pathway

• Informing eligibility criteria

• Including important contextual factors
Developing logic models

- Where to start:
  - Think about aim of logic model e.g.
    - Conceptualise question
    - Show causal pathway
    - Synthesise results
  - Look for existing logic models
  - Templates might be useful
    - System-based logic model: To conceptualise question
    - Process-orientated logic model: To show causal pathway
Developing logic models

- Iterative process
- Takes time
- But time well spent!
System-based logic model template

Process-orientated logic model template

Some lessons learnt and practical tips

• Logic models should not be too complicated
  • Keep it simple
• It takes time and effort to develop
  • No quick fix
• Usually takes a lot of iterations
  • Use paper and pencil and keep track of drafts
• Templates can be useful but are no straitjacket
  • There is no right or wrong
• Requires feedback from others
  • Does it make sense?
Limitations of logic models

• Limited to a specific review question
  • Does not necessarily reflect ‘real world’

• Can influence how review is conducted
  • Depends on author team

• Potential overcrowding

• Can delay systematic review process
  • Time intensive
Small group work:

• You are an author team developing a protocol for a systematic review on e-learning vs. face-to-face learning of EBHC to increase EBHC knowledge, skills, attitude and behaviour of healthcare professionals

• You decide to develop:
  1. A system-based logic model to depict the interaction between the participants, the intervention, the outcomes and the context
  2. A process orientated framework to depict the processes and causal pathways that lead from the intervention to its outcomes

• In your group, discuss how you would proceed and draw a logic model (1 or 2, as allocated) on the flipchart paper

• Select one member of the group to give feedback
E-learning of evidence-based health care (EBHC) to increase EBHC competencies in healthcare professionals: a systematic review

Anke Rohwer, Nkengafac Villyen Motaze, Eva Rehfuess, and Taryn Young
### Participants
- Type of healthcare worker (e.g. medical doctor, Nurse, Physiotherapist etc.)
- Level of education (undergraduate, postgraduate, CME)

### Intervention
**Theory**
- Adult learning theory:
  - Self-motivation
  - Personalised learning
  - Distributed learning

**Intervention design**
- Course, module, curriculum, workshop on EBHC
- Learning objectives and content of educational activity
  - EBHC enabling competencies (epidemiology, biostatistics, basic searching skills, critical thinking)
  - EBHC key competencies (asking questions, accessing literature, critically appraising literature, applying results, evaluating the process)
- Multifaceted intervention vs. Single intervention

**Execution**
- Duration (6 weeks, one year etc)
- Intensity (e.g. 2 hours)
- Dose (e.g. twice a week; once a month)
- Timing (within study programme etc.)
- Integrated or stand-alone

### Intervention delivery
**Dimensions:**
- Pure e-learning vs. Blended learning
- Collaborative (interactive) vs. Individual learning
- Synchronous vs. Asynchronous delivery

**Delivery agent:**
- Facilitators and tutors: Attitude, communication skills, teaching skills, engagement with learners

**Organisation and structure:**
- Institutions offering educational activity (cost, capacity, culture)

### Educational context
**Setting**
Location where learning takes place
- Same place vs. distributed
- Home, workplace, university, library, classroom, bedside etc.

**Learner context**
- Background knowledge of EBHC
- Computer literacy
- Learning style
- Motivation

**Institutional context**
- Structure of course within larger curriculum
- Role models

**Socio-economic context**
- Access to internet
- Access to information (databases and electronic journals)
- Affordability
- Availability of electricity
- Availability of personal computers

### Outcomes
**Intermediate outcomes**
**Process outcomes**
- Barriers to method of teaching EBHC
- Enablers of method of teaching EBHC
- Learner satisfaction
- Teacher satisfaction
- Cost
- Attrition

**Surrogate outcomes**
- EBHC knowledge*
- EBHC skills*
- EBHC attitude*

**Behaviour outcomes**
- EBHC behaviour* (e.g. Question formulation, reading habits etc)
- Evidence-based practice
- Learner adherence

**Non-health outcomes**
- Evidence-based guideline implementation
- Health care delivery (health systems)

**Health outcomes**
- Individual health outcomes
- Population health outcomes

### Healthcare context
**Socio-cultural**
- Sociocultural

**Epidemiological**
- Legal

**Ethical**
- Political

*Bold outcomes represent primary outcomes, the rest refer to secondary outcomes
EBHC teaching and learning

EBHC knowledge

EBHC skill

EBHC attitude

EBHC behaviour e.g. reading behaviour, question formulation

Adherence to evidence-based guidelines

Implementation of evidence-based guidelines

Evidence-based practice

Improved health care delivery
Improved health outcomes
Useful reading


Thank You