A systems approach to assessing complexity in health interventions: an effectiveness decay model for integrated community case management

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

ID 4603372
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Year 2020
Title A systems approach to assessing complexity in health interventions: an effectiveness decay model for integrated community case management
Journal Global health action
Volume 13
Number 1
Pages / **Article-Number** 1794106
Keywords bottleneck analysis; data visualization; iCCM; process mapping; sankey diagram; systems thinking tools
Mesh terms Case Management, organization & administration; Child; Child Health; Child Health Services, organization & administration; Community Health Workers, organization & administration; Humans; Systems Analysis

Complexity is inherent to any system or program. This is especially true of integrated interventions, such as integrated community case management (iCCM). iCCM is a child health strategy designed to provide services through community health workers (CHWs) within hard-to-reach areas of low-and-middle-income countries (LMICs). It is comprised of many interlinked program components, processes and stakeholders. Elucidating the complexity of such programs is essential to designing interventions that respond to local contexts and successfully plan for sustainable integration. A pragmatic approach has yet to be developed that holistically assesses the many dimensions of iCCM or other integrated programs, their alignment with local systems, and how well they provide effective care. We propose an accessible systems approach to both measuring systems effectiveness and assessing its underlying complexity using a combination of systems thinking tools. We propose an effectiveness decay model for iCCM implementation to measure where patient loss occurs along the trajectory of care. The approach uses process mapping to examine critical bottlenecks of iCCM processes, their influence on effectiveness decay, and their integration into local systems; regression analysis and structural equation modeling to determine effects of key indicators on programmatic outcomes; and qualitative analysis with causal loop diagramming to assess stakeholder dynamics and their interactions within the iCCM program. An accurate assessment of the quality, effectiveness, and strength of community-based interventions relies on more than measuring core indicators and program outcomes; it requires an exploration of how its actors and core components interact as part of a system. Our approach produces an interactive iCCM effectiveness decay model to understand patient loss in context, examines key systems issues, and uses a range of systems thinking tools to assess the dynamic interactions that coalesce to produce observed program outcomes.

ISSN/ISBN 1654-9880
edoc-URL https://edoc.unibas.ch/78472/
Full Text on edoc Available;
Digital Object Identifier DOI 10.1080/16549716.2020.1794106

PubMed ID http://www.ncbi.nlm.nih.gov/pubmed/32772891
ISI-Number WOS:000557924800001
Document type (ISI) Journal Article