How do Evidence and Value Impact Decision Making? EVIDEM – a practical framework applying multicriteria decision analysis (MCDA) to structure and facilitate healthcare decisionmaking

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Background

• Healthcare decisionmaking is a complex process that requires simultaneous integration of numerous disparate types of information.1
• Population based and individual decisionmaking can be divided into two steps: scientific judgment to evaluate the quality of evidence and value judgment about the healthcare intervention.1,2
• There is a need, nationally and internationally, for transparent access to evidence and values on which healthcare decisions are made.4,5
• Multi-Criteria Decision Analysis (MCDA) is an established method widely used in numerous disciplines. It structures the decisionmaking process by breaking down the problem into the set of criteria which are expected to impact the value of an option.1,11 It has been applied within several areas of healthcare decisionmaking1,14 and presents a promising approach to reimbursement decisionmaking.
• We hypothesized that healthcare decisionmaking could be facilitated by structuring the evidence and value judgments on which it is based into a practical and transparent architecture and that transparency would enhance understanding and implementation of healthcare decisions.

Objectives

• Breakdown components of healthcare decisionmaking into practical tools that structure and quantify assessment of healthcare interventions
• Build an architecture to provide timely access to transparent multiple layers of the components of decisionmaking.
• Ultimately, optimize healthcare and health through best use of healthcare interventions

Conceptual framework and architecture

• A conceptual framework was developed that segregated components of decisionmaking into quality of evidence and two types of value judgment; intrinsic value of the healthcare intervention and extrinsic or system-related value.
• It was hypothesized that segregating these concepts would make reasoning more explicit, increase transparency and facilitate complex healthcare decisionmaking.
• Quantifiable components that shared commonly agreed direction of scoring were organized into matrices (quality of evidence and intrinsic value)
• Extricable value components for which a scoring system would need consensus development (e.g., appropriate use, opportunity costs, organizational structure, stakeholder pressures, political context, population priorities & access) were structured into a table for consideration by decisionmakers.

MCDA Value Matrix

• Assesses the intrinsic value of a healthcare intervention from a specific perspective; it is applicable by decisionmakers at micro (patients, clinicians), meso (payers, institutions) and macro (health policymakers) levels.
• Components defining intrinsic value were identified through literature review, review of explicit criteria used by decisionmaking bodies, and also criteria used to prioritize technology assessment in numerous jurisdiction globally.1,12
• 15 components were selected to fulfill MCDA-mathological criteria of completeness, redundancy, operability & mutual independence13,14 and grouped into 4 clusters.

MCDA Quality Matrix

• Assess the quality of all types of evidence for a healthcare intervention;
• 12 QM criteria (now) identified from literature review and requirements from >30 benchmarking organizations15 organized by field (e.g., CONSORT, CHEC, STROBE, Siegel et al, Moher et al).16-20
• 3 QM criteria of quality (columns) relating to: a) scientific quality (relevance and validity of evidence available); b) quality of reporting (completeness and consistency of evidence in high level documents and in individual studies); and c) adherence to decisionmaking requirements; and
• Questions and instruments for QM derived from international scientific standards (e.g., CONSORT, CHEC, STROBE, Siegel et al, Moher et al).16,17

2-step assessment:
• Weighting of VM components from the societal perspective, independent of scoring framework.
• Scoring of healthcare intervention using scale anchors & scoring guidelines combined with access to synthesized data (prepared using standardized methodology), quality of evidence scores & rationales (QM) and full text sources.

Potential applications & developments

• EVIDEM supports decisionmaking by structuring, segregating and providing transparent access to data, and by allowing communication of process and decisionmaking.
• It can be applied retrospectively to generate data on quality of evidence or on past decisions and prospectively to integrate tools into existing decisionmaking processes and explore extrinsic components (e.g., application).
• On the collaboration axis, EVIDEM provides a practical framework to facilitate communication between those who generate data and those who need it to make decisions, facilitating future healthcare decisionmaking.
• It can be used for any type of healthcare intervention, and by policy or clinical decisionmakers.

Proof of concept: Pilot study in Canadian context

• The feasibility and value of EVIDEM was assessed by applying it to historical cases: 10 medicines (A-J) were assessed (cardiovascular disease, endocrinology, infectious disease, neurology, oncology, ophthalmology) using data from literature review and manufacturer dossiers submitted to the Canadian Common Drug Review and Quebec Conseil du Medicament. QM scoring was performed by EVIDEM investigators. VM weights, scores and feedback on process were provided by the Canadian Value Panel, composed of representative stakeholders from across health policy (decisionmakers, specialists, generalists, nurses, pharmacists, health economists/epidemiologists).

• 4-step assessment:
  • Literature review for all types of evidence for the healthcare intervention;
  • Analysis of available evidence (public and manufacturer);
  • Analysis of requirements of decisionmaking body to which manufacturer dossier is submitted;
  • Completing, scoring and providing rationale for each QM cell.

Potential applications & developments

• Future developments include collaborative studies and iterative processes to explore the value of EVIDEM in context as well as development of an interactive electronic platform integrating evidence and value for each healthcare intervention.
• The expected outcome of a systematized and shareable approach for data access and value assessment is to optimize resources, decisions and health.

Acknowledgements

We wish to recognize the contributions of the Canadian Value Panel: Jean-Francois Beaudry (AstraZeneca); Mike Baker (Director, Pharmaceutical Policy and Research Unit); Department of Pharmacy Services, University of Ottawa; Barbara Berkley (Astellas); David Boakes (PhD, Associate Professor, Department of Health Policy, Management & Evaluation, University of Toronto); Jamie Broad (PhD, Associate Professor, Department of Library Science, University of Toronto); Michael Burkhard (PhD, Assistant Professor, Centre for Evaluation of Medications, Department of Drug Information, University of Ottawa); Jean-Luc Carignan (Centre de Recherche dans le Domaine des Technologies de la Santé, Université Laval); Jean-Francois Corriveau (PhD, Director, Centre for Research in Health Outcomes and Policy, University of Victoria); and Kim Green (PhD, Michigan State University). Ethan Goldfarb, Department of Pharmacy, CHU Sainte-Justine Research Center; Benoit Cossette BPharm MSc, Pharmacist and Senior Scientist, Child Health Evaluative Sciences, The Hospital for Sick Children; for the development of the decisionmaking body requirements; and about 250 hrs to build the structured knowledge base.

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References
