Evidence and Value: Impact on DecisionMaking – the EVIDEM framework and potential applications

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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(s).²–⁴

• There is a need, nationally and internationally, for transparent access to evidence and values on which healthcare decisions are made.⁵,⁶

• Multi-Criteria Analysis (MCA) is an established method widely used in numerous disciplines. It structures the decisionmaking process by breaking down the problem into a set of criteria which are expected to impact the value of an option.⁷–⁹ It has been applied to several aspects of healthcare decisionmaking¹⁰ and presents a promising approach to reimbursement decisionmaking.¹¹

• We hypothesized that healthcare decisionmaking could be facilitated by structuring evidence and value judgment on which it is based into a practical and transparent architecture and that transparency would enhance understanding of healthcare decisions.

Objectives

• Breakdown components of healthcare decisionmaking into practical tools structuring and quantifying assessment of healthcare interventions to facilitate decisionmaking.

• Build an iceberg architecture to provide multiple layers of transparent access to components of decisionmaking.

• Ultimately, to optimize health by 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 decisionmaking components.¹² It was hypothesized that segregating these concepts would make reasoning more explicit, increase transparency and facilitate complex healthcare decisionmaking.

Quantifiable components that shared common agreed direction of scoring were organized into matrices.

MCDA Value Matrix

• Assesses the intrinsic value of a healthcare intervention from a specific perspective; it is applicable by decisionmakers at micro (patients, by clinicians), meso (healthcare organizations/payers, policymakers) levels.

• Components of intrinsic value were identified through literature review, review of expert criteria used by decisionmaking bodies, and also criteria used by prominent technology assessment in numerous jurisdictions globally.¹¹,¹²

• It was hypothesized that segregating these concepts would make reasoning more explicit, increase transparency and facilitate complex healthcare decisionmaking.

• 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 decisionmaking components.¹²

• The architecture was built to facilitate communication, collaboration and common understanding.

• Integrated procedures were developed to ensure efficient use of resources as we develop & deploy this architecture to healthcare intervention assessment.

MCDA Quality Matrix

• Assess the quality of all types of evidence for a healthcare intervention: 12 QM components (rows) identified from literature review and review of explicit criteria used by decisionmaking bodies, and 3 QM criteria of quality (columns) relating to: 1) scientific quality (relevance and validity of evidence available), 2) quality of reporting (completeness and accuracy of evidence in disease), and 3) adherence to decisionmaking body requirements.

• Questions and checklists for 36 QM cells derived from international scientific standards (e.g., CONSORT, CHEC, STRICTE, Siegel et al, Mauelshagen et al)¹³

• 2-step assessment:

  • Weighting of VM components from the ancillary perspective, independent of scoring healthcare intervention; and

  • Scoring of healthcare intervention using scale anchors & scoring guidelines combined with access to synthesized data (prepared using standardized methodology), quality of evidence scores & rationales (QMs) and full text sources.

• 4-step assessment:

  • Literature review for all types of evidence for the healthcare intervention:

    • Analysis of available evidence (public and manufacturer);

    • Analysis of required decisionmaking body to which manufacturer dossier is submitted; and

    • Scoring and providing rationale for each VM cell.

Proof of concept: Pilot study in Canadian context

The feasibility and value of EVIDEM was assessed by applying it to Canadian historical cases. 11 medicines were assessed in therapeutic areas of cardiovascular disease, endocrinology, infectious disease, neurology, oncology, ophthalmology) using data from literature review and manufacturer dossiers submitted to the Canadian Common Drug Review (CDR) and Quebec Conseil du Médicament (QCM). QM scores were performed by EVIDEM investigators. VM weights and scores, and feedback on process was provided by the Canadian Value Panel, composed of representative stakeholders from across Canada (decisionmakers, specialists, generalists, nurses, pharmacists, health economists/epidemiologists).

• Was the approach feasible? An algorithm was developed to operationalize each cell of the matrices and this was applicable to all therapeutic areas and jurisdictions covered.

• Was it practical? It took 30 min on average to apply VM by stakeholders and about 250 hrs to build the structured package of fully traceable information (quality, synthesized format and full text access) and value scores (e.g., 72±25% of max score for T3 for medicine J).

• Feedback from panels: value of EVIDEM was in structuring evidence, assessing strengths and weaknesses systematically sharing values and value scores.

• Limitations of pilot included limited access for panels to the underlying source data (electronic interface to be developed) and extrinsic components not covered (to be explored).

Potential applications & developments

• EVIDEM supports decisionmaking by structuring, segregating and providing transparent access to data, and scoring and reasoning over components of decisionmaking.

• It can be explored retrospectively to generate data on quality of evidence or on past decisions and prospectively to integrate into existing decisionmaking processes and explore extrinsic components (Application axis).

• On the collaboration axis, EVIDEM provides a practical framework to facilitate communication between those who generate data and those who will use this data to make decisions, facilitating future healthcare decisionmaking.

• It can be used for any type of healthcare intervention, and by policy or clinical decisionmakers.

• Future developments include collaborative studies and iterative processes to explore the value of EVIDEM in context as well as development of an interactive electronic architecture integrating evidence and value for various healthcare interventions.

• The expected outcome of a systematized and shareable approach for data access and timely assessment is to optimize resources, decisions and health.

References

5. A practical iceberg architecture was designed to support decisionmaking using a MCDA approach to structure intrinsic value components in a Value Matrix (VM) while providing transparent access to evidence (synthesized and full text) and full text sources of evidence quality matrices (QMs). The architecture was built to facilitate communication, collaboration and common understanding.

6. Integrated procedures were developed to ensure efficient use of resources as we develop & deploy this architecture to healthcare intervention assessment.

7. References