

Scientific evidence in decision making: a reflection for healthcare organizations

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Abstract *The objective was to analyze the results of the project Support for the formulation and implementation of evidence-informed health policies (ESPIE) developed between 2015 and 2023, at Hospital Sírio-Libanês, to support decision-making in health organizations. This study was carried out through triangulation between the published results of the project, Simon's Decision-Making Theory and the experience of the authors, participants in the implementation of the project. The analysis was guided by the following question: What advances, limits and learnings were observed in the implementation of the use of scientific evidence in decision-making in organizational contexts, within the scope of the project? It was found that the incorporation of knowledge in health organizations is a complex process that needs to consider the dynamics of the decision-making chain, the behavior of authorities in favoring or legitimizing them, and barriers rooted in the organization's culture and that compete with new knowledge. It is concluded that the more successful the strategies are, the more the individual capabilities acquired interact with the contexts of the organizations and with the actors in the decision-making chain.*

Keywords Evidence-Informed Policies; Health Organizations; Decision Making; Unified Health System

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Introduction

The use of the best available evidence for decision-making in health is essential to qualify the use of public resources, providing efficiency, efficacy, effectiveness, equity, and transparency in the formulation, implementation, and monitoring of policies¹. Scientific evidence is considered to be that produced through formally structured research and with rigorous methods. For this evidence to support the resolution of complex public health problems, it is necessary to contextualize it, considering local, tacit, or colloquial factors, which include opinions, values and habits of decision-makers and society².

Evidence-Informed Policies (EIP) result from the systematic, transparent, and balanced interaction of different types of information, which guide decision-makers in choosing the best options to address priority public health issues and problems. EIPs adopt mechanisms in such a way that evidence serves to support more well-informed decisions². In Brazil, PIEs have advanced under the leadership of the Ministry of Health, within the scope of the Unified Health System (SUS), especially through the Evidence-Informed Policy Network (*Rede de Políticas Informadas por Evidências* – EVIPNet Brasil), created in 2010 and integrated into EVIPNet Global, led by the World Health Organization (WHO)³.

One of the main challenges of EPI is to make the use of evidence sustainable throughout the policy formulation and implementation process. The more institutionalized the EPI mechanisms and tools are, the more evidence can be legitimized as a valuable subsidy for decision-making⁴. In addition to legitimization, which, in this case, refers to the fact that the use of evidence is understood as useful, desirable, and appropriate and, consequently, becomes part of the organization's values and beliefs, acceptance of this use is necessary. Acceptance, in this context, is defined as its insertion into the standardized behaviors of the organization's daily life, regardless of the individuals who carry out the actions.⁵

In 2022, the National Collaborating Centre for Methods and Tools at McMaster University published a quick review of strategies that are being used to implement EIPs in health organizations⁶. Two major strategic lines were identified: one that extends to all decision-making processes, encompasses more general aspects of organizational culture, and involves the training

and involvement of workers at all levels, and a second one that refers to organizational dynamics as a whole. The other line of intervention is more focused, aimed at incorporating the use of evidence into health practices and specific programs. The first seems to be more challenging, as it requires major organizational changes and, even when successful, can take several years to implement. The second depends primarily on the involvement of the teams that are intended to be reached. Aspects like leadership and communication are crucial to intervention strategies.

One of the Brazilian initiatives aimed at supporting the use of scientific evidence in health decision-making is the Support for the Formulation and Implementation of Evidence-Informed Health Policies (EIHP) project, developed within the scope of the Institutional Development Support Program of SUS (PROADI-SUS) and implemented by the Sírrio-Libanês Hospital (HSL), in partnership with the Secretariat of Science, Technology, Innovation, and Health Complex (*Secretaria de Ciência, Tecnologia, Inovação e Complexo da Saúde* – SECTICS) of the Brazilian Ministry of Health, the National Council of Health Secretaries (*Conselho Nacional de Secretários de Saúde* – CONASS), and the National Council of Municipal Health Secretaries (*Conselho Nacional de Secretarias Municipais de Saúde* – CONASEMS). This project has been in development since 2015, with a national scope and actions in all geographic regions of the country, involving hundreds of participants, including students, teachers, and EIP specialists. Considering the accumulation of results of the project in question, coupled with the experiences of the actors involved in it, the present study aimed to analyze the results of the EIHP project to support decision-making in health organizations.

Methodological design

The methodological design consisted of an analytical study of the EIHP project. For this analysis, the theoretical-conceptual framework of Simon's Decision-Making Theory was triangulated with the published results of the project in question and the authors' experience, embodied in the implementation of the project.

Since the EIHP project's main objective was to support the formulation and implementation of health policies in participating organizations through the incorporation of scientific evidence in the decision-making process, the question

that guided the analysis was: What advances, limits and lessons learned were observed in the implementation of the use of scientific evidence in decision-making in organizational contexts within the scope of the project?

Simon's Decision-Making Theory

The theoretical-conceptual framework used in this study is based on the Decision-Making Theory in Administrative Organizations, especially as regards decision-making processes in organizations. For the purpose of this analysis, we highlight some key aspects that we consider most relevant.

Simon considers Herbert Alexander Simon⁷⁻⁹. This author developed a broad discussion on what an organization refers to as “the complex system of communications and inter-relations existing in a human group” (p. 14)⁷, and such a system provides each member of the group:

information, assumptions, objectives, and attitudes that go into their decisions, also providing them with a set of stable and comprehensive expectations regarding what the other members of the group are doing and how they will react to what they say and do (p. 14)⁷.

According to the author, the decision-making process is the core of management and, therefore, such a process, together with the development of action, should be part of any theory of management. “In short, a general theory of administration must include both principles of organization that ensure correct decision-making and principles that ensure effective action” (p. 1)⁷.

The decision-making process is based on thought and action, culminating in a selection. In this process, which combines judgment and decision-making, alternative courses are chosen, accepting or rejecting specific actions. Faced with the demands of reality, the search for solutions, by interrupting the process to analyze it, is not always possible. Therefore, it is necessary to experiment, be flexible, adapt, and act in a continuous learning process⁸.

As with behaviors in general, members of organizations behave based on the selection of actions that are physically possible to be performed. This can occur consciously or unconsciously. In this sense, the selection process can be either reflexive or conditioned, or it can be a product of a complex chain of activities⁷.

An organization can be conceived as a decision-making system. In his theory, Simon distinguishes two types of decisions: programmed or non-programmed. According to the author, these types are not actually distinct, but rather form a continuum that ranges from the programmed (structured) to the non-programmed (unstructured) pole, with decisions in between. Decisions are programmed to the extreme in such a way that they can be both repeated and routine, in similar scenarios for which they were created, without having to be treated again⁸. The author develops discussions that deal with programmed decision-making through the use of mathematical models and computational operations⁸, and, for this reason, he is considered one of the precursors of artificial intelligence studies.

According to Simon, three phases make up the decision-making process. The first of these, called intelligence activity, consists of observing the organization's environment in order to identify situations that require decision-making. The second phase, called design activity, refers to inventing, developing, and analyzing possible courses of action or alternative solutions. Finally, the choice activity concerns the selection of a specific, most appropriate course of action among the various alternatives generated in the previous phase⁸.

In the conclusion of one of his texts, Simon considers that – even though there are limitations and he is not always able to answer the questions that need answers – man, amidst the complexity that goes beyond his understanding, is capable of processing information to seek alternatives, calculate consequences, resolve uncertainties and, thus – sometimes, but not always – find means of action that are sufficient in his contemporary world⁹.

The EIHP Project

During the project implementation period – 2015/2023 – two distinct strategies were developed: training people in EIHP management and developing devices and tools to be used by organizations to expand the use of EIPs.

Training sessions

These were developed through three specialization courses, held between 2015 and 2020. The objectives of the courses were to develop individual and group cognitive skills in EIP and to support students in applying the knowledge acquired in the organizations of which they were part. These organizations were nearly all public (more than 90%) and were mostly part of municipal and state health systems. The participating students were, in general, health professionals who worked directly in or provided support to the management of the organizations.

The courses were developed through a constructivist approach, using active methodologies. The teaching-learning process was mediated by problematization and problem-based learning, and was anchored in interactionist theories of education, scientific methodology, meaningful learning, integration between theory and practice, and dialogism. The curricula were competence-oriented and structured around two axes: simulation of practice and real work context.

The training process was supported by teachers/facilitators at the local level, and the students were trained to analyze and act on the context in which they worked in order to develop EIP. The students chose priority public health problems and the best options to solve or minimize them, and, together with other decision-makers, were encouraged to promote the best choices to address them¹⁰⁻¹¹⁻¹².

The three educational initiatives took place in 36 host cities, in mostly large and medium-sized cities, distributed throughout all geographic regions of Brazil, in addition to two groups outside the country, one in Córdoba/Argentina and another in Montevideo/Uruguay. A total of 1,010 experts in EIHP management were certified.

The application of the knowledge acquired in the organizations of which the students were part sought to support the use of scientific evidence to solve specific health problems in these organizations. This support, like the other activities developed in the course, involved the participation of teachers/facilitators and was provided through the development of intervention projects. These projects, sometimes preceded by the development of evidence summaries, were developed in stages that began with the selection of a problem considered to be a priority or relevant, followed by an explana-

tion of the problem and, considering the feasibility and viability resulting from an analysis of the context, an intervention was proposed and developed. Two methodological frameworks were used to develop the interventions: Carlos Matus's situational strategic planning¹³ and the SUPPORT tools^{14, 15}. The adoption of these methodological strategies was associated with periodic interactions and dialogues with relevant actors in the students' organizations to validate, legitimize, and qualify the choices of problems and the proposed interventions. In 2022, a survey was conducted with graduates from the three editions to, among other aspects, capture their perceptions about the incorporation of the required capabilities in the competency profile and the conditions for their applicability in the SUS organizations in which they were working. The perceptions were quite optimistic regarding the appropriation and use of the cognitive capabilities in EIP acquired in the courses – the majority responded that they began to value and use evidence more in their practices, including participation in the preparation of evidence syntheses – but they were not so optimistic in the questions that referred to the permeability of the organization in incorporating this practice in its decision-making processes. This was interpreted as a result of insufficient awareness and engagement of managers as well as the complex challenges inherent in changing organizational practice and culture¹⁶.

EIP tools and devices

In the period from 2021 to 2023, in alignment with the strategic planning guidelines of the Department of Science and Technology of the Ministry of Health (Decit/SECTICS/MS) and with the EVIPNet Network, the EIHP project redirected its strategies, developing tools and devices with the potential to raise awareness and support public managers and others involved in the decision-making process for the development of EIP:

Support guide for Evidence Centers (Núcleos de Evidências – NEv)

Its purpose was to guide organizations in structuring or improving NEv. The function of these centers is to translate knowledge to produce EIPs in an articulated manner, generally meeting the needs of decision-makers¹⁷.

Competency profile of the EIP professional in Brazil

This was developed in an attempt to outline the set of knowledge, skills, and attitudes that would need to be developed for qualified performance in EIP¹⁸⁻¹⁹. Applying the profile to health systems and service organizations allows one to map the capabilities of individuals and teams in EIP, as well as to contribute to the investigation of these potentialities and the identification of gaps to be filled in order to expand the use of evidence in the decision-making process.

Scoping review “Strategies for communicating health evidence to managers and the population”

This was developed in partnership with the Health Technology Assessment Center and the HSL Evidence Center (NATS-NEv/HSL), and, seeking a simplified communicative language, aimed to contribute to the communication of evidence, making it more effective for the target audiences²⁰⁻²¹.

Discussion

The training sessions provided within the scope of the EIHP project aimed to develop EIP capabilities and provide support for students to apply them in the organizations they were part of, that is, to incorporate new knowledge into decision-making. According to the question presented by Simon, how do organizations behave when faced with new knowledge?

Simon draws attention to the positive correlation between knowledge and administrative rationality. He believes that knowledge is a key factor for more rational decisions made by organizations; however, he also identifies many limits to the expression of rationality in the decision-making process. In this regard, he states that administrative theory, in its essence, is the “theory of the intentional and limited rationality of human behavior” and that “the main concern of administrative theory lies in the limits between the rational and irrational aspects of the social behavior of human beings” (p. XXIII)⁷.

Real behavior, he claims, does not achieve objective rationality for three reasons: (i) rationality requires a complete and anticipated knowledge of the consequences resulting from each option; (ii) since the consequences result

from the future, imagination and conjecture are used, but they can only be anticipated imperfectly; and (iii) rationality presupposes a choice between the possible results that will arise from the decision and, in real behavior, only a fraction of these different alternatives are taken into consideration⁷.

Still on rationality, he continues, it requires complete and unattainable knowledge of the consequences of each choice and, in the real world,

human beings have fragmented knowledge of the conditions surrounding their actions, and a slight perception of the regularities of phenomena and laws that would allow them to generate future consequences based on the knowledge of current circumstances (p. 84)⁷.

As a result, he continues, “complete rationality is limited by the absence of knowledge” (p. 85)⁷.

We understand that, in addition to knowledge commonly being insufficient – partial and incomplete – its effective incorporation into the organization’s decision-making process is clearly far from being linear and automatic. When reading Simon’s decision-making theory, it can be inferred that, among the factors that interfere in this incorporation, three stand out: the position that the decision-maker occupies in the organization’s decision-making chain, the behavior of the most empowered authorities in favoring or legitimizing the use of knowledge, and factors usually present in the organization that compete with and hinder the effective appropriation of knowledge in the organizational dynamics.

Decisions about health policies are made at different levels, from the highest in traditional hierarchical plans to the political microspaces in which policy operators and their “direct consumers” interact. Although there is mutual interference between these levels, they preserve spaces of autonomy to decide and can react in different ways to the incorporation of knowledge, which has the potential to interfere in their choices.

Authorities naturally have greater power to influence the incorporation of knowledge through the organization. Although organizational levels are not always open to the determination of authorities, their influence in raising awareness about its importance and encouraging the use of new knowledge is undoubtedly important. As Simon states, “An extremely important function of authority is to obtain

decisions with a high level of rationality and effectiveness” (p. XVI)⁷. To this end, it is important that they have the sensitivity to perceive and act when decision-making processes that follow automated, unconscious, and irrational habits need to be interrupted, qualified, and innovated in light of updated knowledge⁷.

Among the factors that can compete with the effective use of new knowledge in decision-making, two stand out and are highlighted by Chester I Barnard in the introduction to one of Simon’s books⁷: the influence of know-how and patterns of behavior rooted in the organizational culture. Know-how refers to “already knowing how to do it”. These are situations in which decision-makers act, even unconsciously, as if they always had ready-made answers to the problems that arise. Decision-making is heavily influenced by habit, following the usual flow in an unconscious sphere of knowing and doing, that is, the “knowledge” is already given, the decision-maker considers that he already knows the path to take. The other factor, although similar to the first, is more related to the legitimization (formal or informal) of the lines of authority that prevail in the organization. Patterns of behavior are created that legitimize the decision-making power of people who master the technical jargon and who have a broad range of experience, typical of seasoned individuals in certain sectors of the organization, those who, for example, have spent most of their careers in them. In this case, new knowledge competes with experience, which gives the “experienced” a certain symbolic power and gives them the prerogative to decide without necessarily adding other perspectives.

Regarding the EIHP project, these three factors were somehow taken into consideration in the methodological-educational strategies developed. Regarding the first, among the policies listed as priorities for the use of evidence, some clearly permeated the decision-making levels of the organization. The project used the concept of lines of care²² – ways of organizing the flow of health care, designing the user’s itinerary in the health system – in order to plan some of the interventions. The articulation between decision-makers from different therapeutic stations to promote integrated care was considered in the intervention plans, based on the understanding that care permeates organizational levels and, often, the organization itself, as it depends on network integration with other services and organizations. Regarding the sec-

ond factor – the role of authorities in legitimizing new knowledge – this perception was also present in the EIP dissemination strategies. The involvement of the most empowered managers in the organizations, such as health secretaries, was considered an important factor for EIP success. In this sense, both the validation of choices of priority problems and the definition of the main interventions sought to obtain the opinion of these managers, through informal consultations, through the presentation of intervention projects, or by holding deliberative dialogues – a strategy to engage relevant actors in the planning and implementation of policies and services²³.

Regarding the third factor – aspects that compete with the appropriation of new knowledge – strategies were also put into practice to map the motivation of relevant actors to make interventions viable and to convince them to adhere to the proposed measures. For example, actors classified as opposed or indifferent to the implementation of actions focused on EIP were the object of strategies that aimed to convince them and adhere to the proposed measures.

Phases of decision-making

Another concept addressed by Simon is that of decision-making stages²⁴. Before analyzing how these stages occurred in the EIHP project, we will review some of the author’s considerations to better understand his thinking. According to him, decisions result from a complex process of reflection, investigation, and analysis, and it is in this logic that he outlines the stages of decision-making. Continuing this reasoning, the author observes that the cycle of phases can be more complex than the relevant sequence suggests. Thus, each stage can constitute a complex process in itself. Simon establishes relationships between the phases of decision-making (presented below) and the stages of problem-solving developed by John Dewey (What is the problem? What are the alternatives? Which alternative is better?)²⁴.

Bringing Simon’s reflection on the decision-making stages to the EIHP project, the methods adopted included the following steps:

1– Choosing the problem (corresponding to stage 1, proposed by Simon): this was carried out by groups of approximately 10 students each, grouped by the affinity of their professional practices in the organizations in which they worked. Criteria, such as relevance to

public health and magnitude of the problem in the context of the organization, were considered important for the choice. A specificity of decentralized SUS organizations should be considered in this stage: the factors that determine the choice of problems on which to act are influenced by situations that, at those times, give prominence to the decision-making agenda. For example, any coverage given by the press to the difficulty in accessing an emergency unit and the death of a user while waiting for care obviously generates social pressure that influences the choice and opportunity (in this case, the need) to act. In addition to facts like these, decision-making agendas also depend on the spaces of autonomy in which local organizations can formulate and implement policies. In the SUS federative pact, many policies have a centralized formation, with decentralized organizations making decisions mainly related to implementation. This phase of choosing problems is limited to those in which organizations have the greatest capacity to intervene²⁵.

2 – Identification of possible options to solve the problem (corresponding to phase 2 proposed by Simon, also called design activity, which involves mapping the possible alternatives for decision-making): the same groups of students from the previous stage, following the adopted methodological guidance, searched for information, generally systematic reviews, about the best options; analyzed the quality of this information, the equity aspects involved with it, and the implementation barriers; as well as incorporated analyses of the context and tacit knowledge in the judgment about the applicability of the options¹⁴. As Simon observes, this phase may require new information, since “problems, at any level, generate subproblems, which, in turn, have their stages of information, structuring, and choice, and so forth” (p. 16)²⁴.

3 – Choosing the best options for decision-making (corresponding to stage 3 proposed by Simon): the same groups from the previous stages, considering ethical principles, feasibility, and viability, make the choice and plan the operational implementation strategies. The foundations of situational strategic planning (SSP) are considered in this process¹⁶.

After reflecting on the methodological steps used in the project and the phases proposed by Simon, our perception is that it is important to further reinforce the interaction established between students and other actors responsible for the organization’s decision-making chain.

Giving decision-makers a leading role in all phases of decision-making is an important condition for qualifying the stages and increasing the viability of implementing choices.

Finally, some comments are in order as regards the EIP devices and tools developed from 2021 to 2023. The Support Guide for Evidence Centers (NEv), the Competency Profile of the EIP Professional in Brazil, and the scoping review “Strategies for communicating health evidence to managers and the population”, despite having different scopes, have a common purpose considered by Simon to be essential in decision-making: to contribute to strategies for structuring the use of knowledge in the organization, in other words, to greater rationality in administrative behavior⁷. The NEv Guide, if properly adopted by organizations, contributes to the structuring of routine mechanisms for the translation and use of knowledge. The competency profile can identify gaps and potential in the organization’s EIP capabilities, which is the first step to filling them or creating opportunities for them. Strategies to better communicate evidence relate to a specific scope – communication – and address the use of the most appropriate language for different audiences.

These tools can be adapted to the context and needs of organizations. It is important to remember, as Simon states, that an organization’s decision-making process involves a large number of decisions, which is important for decision-makers to develop capabilities or have support that guides them not only episodically, but also routinely, meeting their needs for information and new knowledge. According to Simon, the qualification of the decision-making process depends on a reference system that supports the thinking of decision-makers and presents them with the best solutions to decide or promote engagement in principles and values that should enable decision-making⁷.

Conclusion

The institutionalization of the use of scientific evidence in SUS organizations, while being an explicit desire of such organizations as the WHO and the Brazilian Ministry of Health, is recognized as a complex process that takes time and requires ongoing learning. The learning trajectory resulting from the nine years of implementation of the EIHP project contributed to its continuation, already approved for

implementation in the 2024-2026 triennium²⁶, advancing the objective of institutionalizing EIP in SUS organizations.

As previously explained, to date, the EIHP project has had an indirect interface with the organizations, which occurred mainly through the participation of students as the main protagonists and the organizations as the field of practice. For the 2024-2026 triennium, the project was structured to work directly in collaboration with the organizations, with the objective of developing not only individual and team cognitive capabilities, as in previous projects, but also institutional capabilities in a process of stronger and more articulated interaction with managers and other administrators of the organizations. Partnerships are being planned with participating organizations with the following focuses: awareness-raising, engagement, and adoption of the best strategies, in their respective contexts, to incorporate evidence into decision-making.

This study brought important reflections regarding the challenge of institutionalizing EIP. By making an analogy with a recognized theory of administrative organizations, it was possible to reflect on what an organization is, how it works, how decisions are made, what the role of authorities is, how new knowledge is received, what it competes with, and, finally, what factors influence decision-making.

The dialogue of the theoretical-conceptual framework used with the EIHP project was enriching, as it identified limits and strengths, as well as systematized learning and highlighted new paths.

Contributions

SF Silva and R Gomes conceived the initial idea, drafted parts of the text, and revised all versions of the document. MLT Machado, JOM Barreto, and R Riera contributed to the initial conception, drafted parts of the text, and revised all versions of the document.

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