

Sedimentation of health technology assessment in hospitals: a scoping review

Sedimentação da avaliação de tecnologias em saúde em hospitais: uma revisão de escopo

Sedimentación en la evaluación de tecnologías de salud en hospitales: una revisión de alcance

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Abstract

The aim of this study was to analyze the level of sedimentation of hospital-based health technology assessment (HTA) in diverse contexts. A scoping review was conducted according to the methodology of the Joanna Briggs Institute, whose data analysis model consisted of the combination of Donabedian's structure, process, and outcome categories and the dimensions of the project Adopting Hospital Based Health Technology Assessment in European Union (AdHopHTA). We identified 270 studies, and after removing duplicates and reading full texts, 36 references met the eligibility criteria. Thirty-six hospitals were identified, of which there were 24 large-scale hospitals with extra bed capacity. Twenty-three hospitals were affiliated with universities. Canada stood out with five university hospitals, four of which with public funding. Half of the identified hospitals had hospital-based HTA units (18/36). Hospitals with sedimented levels of HTA corresponded to 75% of the sample (27/36), and the remainder had partially sedimented HTA, or 25% of the hospitals in the review (9/36). There were no hospitals with incipient sedimentation. Measuring the level of HTA sedimentation in the hospitals contributed to understanding how their participation has occurred in the field of hospital-based HTA. This study revealed the importance of identifying factors such as sustainability, growth, and evolution of hospital-based HTA in countries with and without a tradition in this field.

Biomedical Technology Assessment; Hospitals; Health Management; Decision Making; Governance

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Introduction

Health technology assessment (HTA) has created different processes of incorporation of technologies in health services ¹. Each of the various countries has tested HTA mechanisms in forms adapted to their contexts ^{2,3}, considering the nutritional ⁴, demographic, and epidemiological transition ⁵, economic and technological pressures ⁶, expansion of the supply of technologies, and scarce financial investments ^{1,7,8}.

The high demand for technologies in hospital settings ⁹ requires information to orient the decision-making process in the optimization of use of technological advancements ⁹. Many factors influence this process, such as society's expectations for new technologies and high demand for care, increasing costs related to the lack of technical rationality in the acquisition of technologies, and consequently, short- and long-term budget and organizational impacts on hospital finances and patient care ¹⁰.

The use of HTA in hospitals contributes to decision-making, professional training, greater interaction with technical to scientific knowledge, resource-saving, and partnerships ^{11,12,13,14,15}. Hospitals are strategic for the field of clinical management and quality of care ¹⁰ and are open to partnerships with national and international agencies and groups ³ such as the subgroup Hospital-based health technology assessment (HB-HTA), created in 2006 by Health Technology Assessment International ⁵. Acknowledgement of hospitals in this strategic space has meant that HTA agencies have mobilized knowledge and tools to improve hospital management.

Hospital-based health technology assessment or HB-HTA is acknowledged throughout the world ¹, since it allows developing processes, leadership, tools, and good practices in HTA adapted to the hospital setting ^{2,3} to improve treatments, diagnoses, services, and optimization of hospital resources ².

Despite the HB-HTA movement, the incipient application of HTA to the hospital decision-making process is related to incipient planning ⁷, and there is still much room for progress worldwide ¹. Deficiencies in HB-HTA include scarcity of resources and/or a dedicated budget for HTA activities, lack of a qualified teams for managing useful evidence for decision-making processes, obstacles to the use of evidence, and resistance to change by administrators and healthcare professionals ^{1,2,9,10,16}. To minimize these barriers, the exploration of different organizational models ² can be a strategy for reorganization of HB-HTA.

The combination of Donabedian's structure, process, and outcome categories ^{17,18} and the dimensions of the project *Adopting Hospital Based Health Technology Assessment in European Union* (AdHopHTA) ^{2,3} can support the definition of appropriate models for the context of countries such as Brazil, which also experience barriers in this area. The current study thus aims to analyze the level of sedimentation of hospital-based HTA in the Brazilian and international contexts.

Method

This scoping review aimed to discover the level of sedimentation of hospital-based HTA in Brazilian and international experiences. The analytical model consisted of the combination of Donabedian's ^{17,18} structure, process, and outcome categories and the dimensions of the AdHopHTA project ^{2,3}.

The scoping review method was chosen to examine the extent and nature of publications that reported HTA experiences in the hospital setting, allowing to analyze the level of sedimentation in different contexts.

For the purposes of this study, "sedimentation" is defined as the provision of resources, processes, methods, and actions for the effective implementation of HTA in the hospital setting, considering the characteristics that define a hospital-based HTA unit, that is, sedimented in formalization, specialization, integration, authority, and professionalization ^{2,19}.

This review follows the checklist *Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews* (PRISMA-ScR) ^{20,21}. The protocol was registered in the Open Science Framework (<https://osf.io/jtmsc>).

Information sources and search strategy

The data sources were the Virtual Health Library (VHL), MEDLINE/PubMed, Web of Science, Scopus (Elsevier), and Embase, and the searches were performed with the term (MeSH) “hospital” together with the free term “Hospital-Based Health Technology Assessment”. The search was conducted on November 23, 2019 (Supplementary material: http://cadernos.ensp.fiocruz.br/static/arquivo/suppl-e-00352520-ingles_3487.pdf). Additional publications were found in the reference lists of the included articles.

Eligibility criteria and selection processes

The review considered complete articles on experiences related to the management, governance, structure, and organization of HTA in hospitals. The search was not limited by country, year of publication, or language. The sample did not include abstracts and articles that did not address specific contexts in hospitals and with emphasis on efficacy and safety results for specific technologies, except when they presented experiences with assessment criteria and models used by the respective hospitals. The Mendeley software (https://www.mendeley.com/?interaction_required=true) was used to remove duplicates. Two reviewers (J.P.S.G., F.T.S.E.) read the titles and abstracts with the software Rayyan Qatar Computing Research Institute (Rayyan QCRI. <https://www.rayyan.ai/>), and the full texts were read by one reviewer (J.P.S.G.). There was a third reviewer to resolve any doubts (E.B.C.).

Data extraction

Data extraction was done by one reviewer (J.P.S.G.), and the other two reviewers (F.T.S.E., E.B.C.) were consulted in case of doubts on the classification of the respective hospitals. Microsoft Excel (<https://products.office.com/>) was used to build the extraction table. The target variables were title, author, year, country, type of study, hospital identified, hospital's size and profile of care, organizational model of hospital-based HTA, and other analytical dimensions. The hospital's size and profile were analyzed in searches in the hospitals' websites. The hospital's size²² was measured as the number of beds, where up to 50 beds was defined as small, 51 to 150 beds as medium-sized, 151 to 500 beds as large, and more than 500 beds as large with extra hospital bed capacity. The establishments' profile²² was defined as university hospital, specialized hospital, or teaching and research hospital, based on descriptions in the hospitals' websites.

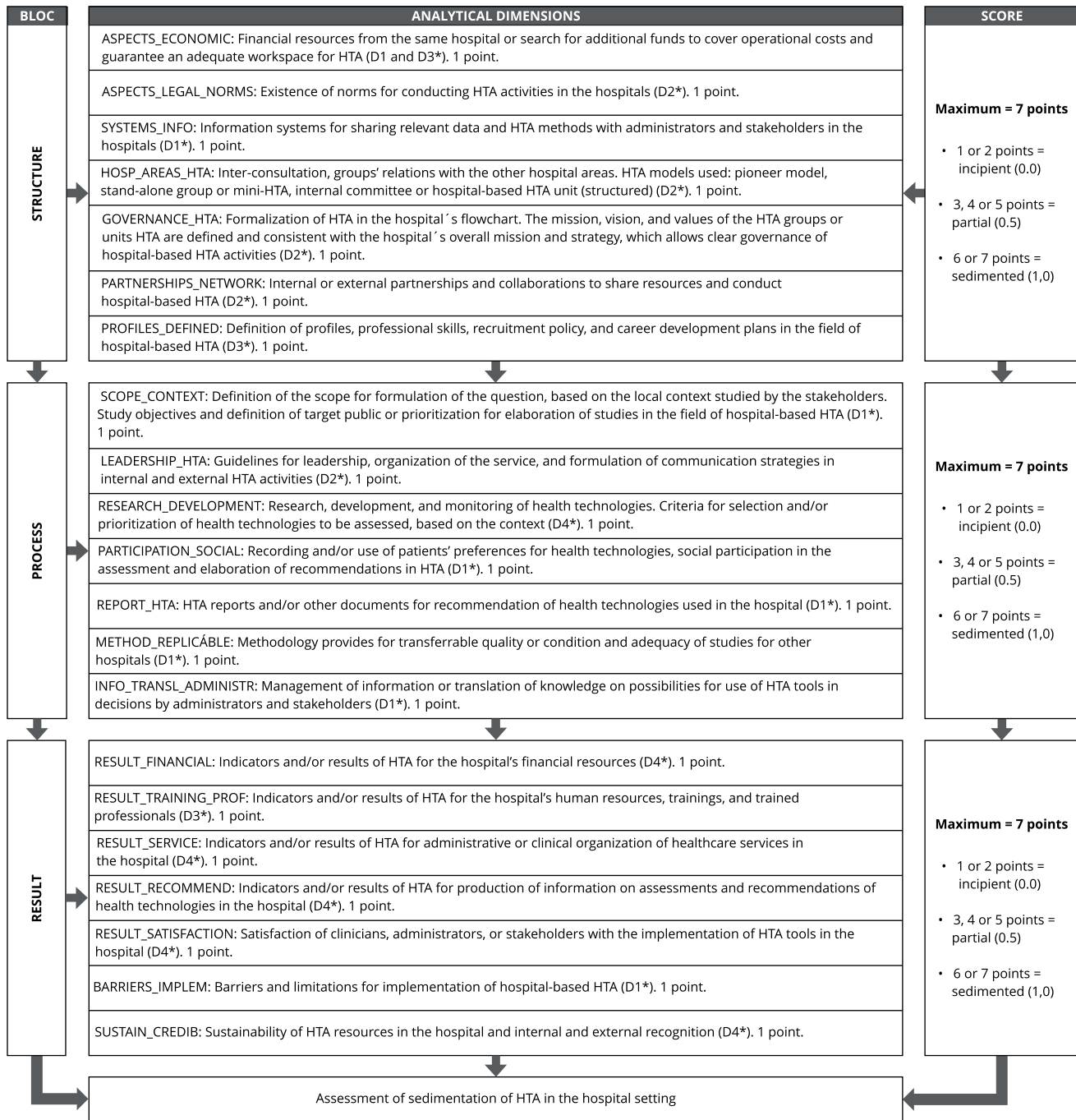
The variable organizational model of hospital-based HTA was based on the structure of *The AdHopHTA Handbook*^{2,23}, corresponding to the following categories: “pioneer model or independent group”, opinion-makers that still act individually or informally; “stand-alone HTA or mini-HTA”, professionals with HTA experience that use relevant evidence (clinical, economic, epidemiological, and organizational) to inform decision-makers, involving internal and/or external collaborators; multidisciplinary “internal committee” with review of standardized internal evidence, perspectives, and recommendations; “hospital-based HTA unit”, formal structure dedicated to HTA with a full-time team, production of high-quality material on the incorporation of health technologies and external interface with other networks or institutions.

Twenty-one analytical dimensions were identified and distributed across the structure, process, and outcome categories. Structure included financial, legal, and normative aspects, information-sharing systems, prevailing models, governance, and partnerships for the development of hospital-based HTA. The process category included tools for research, development, and monitoring of HTA. The outcome category included financial indicators, trainings, changes in clinical and management organization, and challenges for the sustainability of HTA in the hospital services^{17,18}.

The 21 analytical dimensions were classified according to the dimensions for good practices in hospital-based HTA in the AdHopHTA project^{2,3}: evaluative process (D1); leadership, strategy, and partnerships (D2); resources (D3); and impact (D4), according to the theoretical model (Figure 1).

Figure 1

Model for characterization of studies included in scoping review on hospital-based health technology assessment (HTA).



* Dimensions of the *Adopting Hospital Based Health Technology Assessment in European Union (AdHopHTA)* model 2,3.

Source: prepared by the authors.

Data analysis

Hospitals identified in the reference lists received one point for each of the 21 dimensions (Figure 1) in case they presented the corresponding information. In cases where more than one hospital was identified, the point for the analytical dimension was divided by the number of hospitals identified. A focus group of three HTA experts harmonized (by consensus) the 21 points of the analytical dimensions across the structure, process, and outcome categories, resulting in up to seven points for each category. When the category resulted in 1 or 2, the HTA was classified as incipient (score 0.0); from 3 to 5, as partial (score 0.5); and 6 or 7 as sedimented (score 1.0). After analyzing the sum of the data, we found sedimentation of HTA activities in the hospitals in three levels 2: “incipient sedimentation” (0.0 or 0.5 final points), corresponding to incipient or low backing of the HTA proposal in the hospitals; “partially sedimented” (1.0 or 1.5 final points), which did not present a completely mature hospital-based HTA structure or process but presented results; and “sedimented” (2.0, 2.5 or 3.0 final points), with definitive and formalized structure, process, and outcomes (Figure 1).

Results

Study searches and selection

The search identified 270 studies, 74 of which remained for reading the full text, 14 of which were eligible. A manual search of the eligible articles' reference lists yielded another 22 studies, for a final total of 36 studies (Figure 2).

Characteristics of the included studies

The 36 included studies were published from 2005 and 2019, with 58.3% published in 2016. The specialized reference for extraction of additional studies was the book *Hospital-Based Health Technology Assessment: the next frontier for health technology assessment*¹, which resulted in the largest share of studies published in 2016. Nineteen countries were identified. Articles and book chapters were part of the studies included in the review, and five studies^{24,25,26,27,28} addressed more than one hospital each.

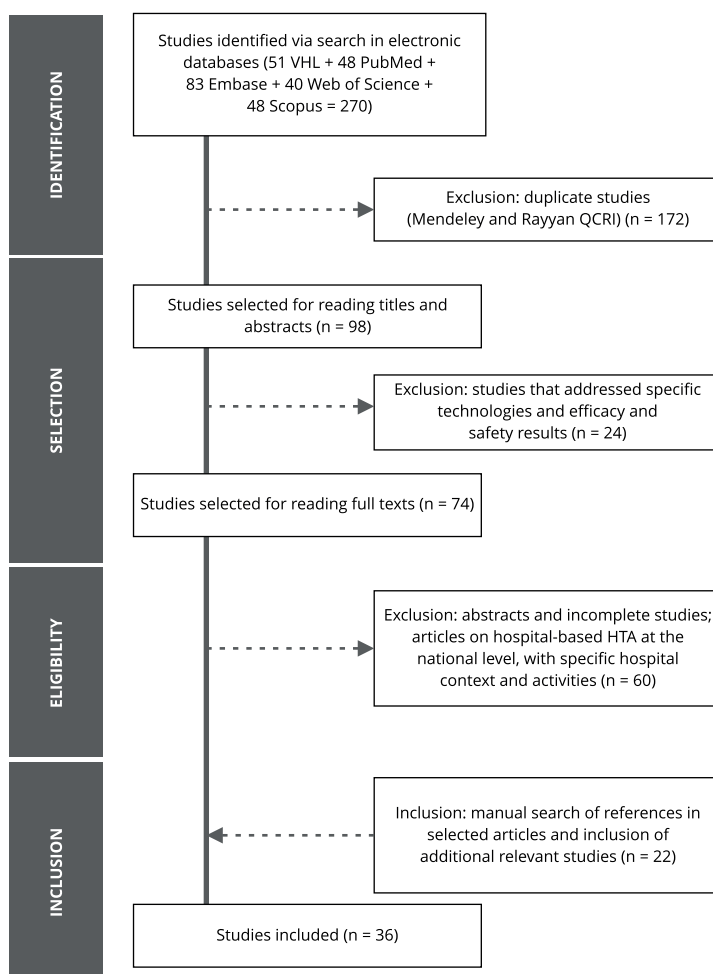
Thirty-six hospitals were identified in the studies (Box 1). Five Canadian hospitals – Centre Hospitalier Universitaire de Sherbrooke (H11), McGill University Health Centre (H12), Centre Hospitalier de l'Université de Montréal (H13), Centre Hospitalier Universitaire de Québec-Université Laval (H14), and Hospital for Sick Children Peter Gilgan Centre for Research and Learning (H15) – formed the largest share of the identified hospitals, with 13.9% (5/36). Brazil had three hospitals (3/36): Clinical Hospital of the Faculty of Medicine of Ribeirão Preto, São Paulo University (H8), National Cardiology Institute (H9), and Nossa Senhora da Conceição Hospital (H10).

As for hospital size, large-scale hospitals with extra bed capacity were the majority, accounting for 66.7% (24/36), followed by large-scale hospitals with 25% (9/36) and medium-sized hospitals with 8.3% (3/36). In Brazil, two hospitals were large-scale and one was large-scale with extra bed capacity. No small-scale hospitals were identified with hospital-based HTA.

As for the institutional profile, 23 hospitals were affiliated with universities, featuring large-scale hospitals with extra bed capacity, with 82.6% (19/23). Nine hospitals were specialized, the largest share of which were large hospitals, with 44.4% (4/9). Four teaching and research hospitals that did not have or did not report affiliation with universities were identified, three of which were large-scale hospitals with extra bed capacity, or 75% (3/4). Of all the hospitals identified, 19 were large-scale hospitals with extra bed capacity affiliated with universities, 89.5% of which (17/19) received government funding. In Canada, four university hospitals received public funding. In Brazil, three hospitals were university/teaching and research hospitals with public funding (3/36).

Figure 2

PRISMA-ScR flowchart for the selection of studies.



HTA: health technology assessment; PRISMA-ScR: *Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews*; VHL: Virtual Health Library.

Source: prepared by the authors, according to checklist PRISMA-ScR 20.21.

As for HTA organizational model, half of the hospitals had hospital-based HTA units, that is, 50% (18/36), followed by stand-alone HTA groups or mini-HTA, with 19.4% (7/36); hospital-based HTA units combined with the internal committee model, with 16.7% (6/36); internal committees with 11.1% (4/36); and the pioneer model or independent group with 2.8% (1/36). Two Brazilian hospitals had hospital-based HTA units, and one had a stand-alone HTA group or mini-HTA (3/36).

Level of sedimentation of health technology assessment activities in the hospitals

In the studies included in the review (Box 1), 75% (27/36) of the hospitals were characterized as having sedimented HTA and 25% (9/36) had partially sedimented HTA according to the respective criteria. The review did not identify any hospitals with incipient sedimentation of HTA (Table 1).

Box 1

Characteristics of included studies and hospitals.

COUNTRY	STUDY/ YEAR	AUTHOR	HOSPITAL	SIZE AND PROFILE	ORGANIZATIONAL MODEL OF HOSPITAL-BASED HTA
South Africa	E1/2016	Mueller & Govender ⁴⁸	Charlotte Maxeke Johannesburg Academic Hospital (H1)	public university LHEBC	Hospital-based HTA unit
Argentina	E2/2015	Demirdjian ⁹	Garrahan Pediatric Hospital (H2)	public specialized LHEBC	Hospital-based HTA unit
	E3/2016	Demirdjian et al. ²⁴	Garrahan Pediatric Hospital (H2) El Cruce Hospital(H3)	Public specialized MSH	Internal committee
Australia	E4/2011	Saaid et al. ²⁵	Hospital A (H4)	Private non-profit specialized LSH	Stand-alone HTA or Mini-HTA
			Hospital B (H5)	Private non-profit specialized MSH	Stand-alone HTA or Mini-HTA
			Hospital C (H6)	Private non-profit specialized MSH	Stand-alone HTA or Mini-HTA
			Hospital D (H7)	Public specialized LSH	Stand-alone HTA or Mini-HTA
Brazil	E5/2013	Nunes et al. ⁵	Clinical Hospital of the Faculty of Medicine of Ribeirão Preto, São Paulo University (H8)	Public university LSH	Stand-alone HTA or Mini-HTA
		Santos et al. ²⁶	National Cardiology Institute (H9)	Public teaching and research LSH	Hospital-based HTA unit
			Nossa Senhora da Conceição Hospital (Grupo Hospitalar Conceição) (H10)	Public teaching and research LHEBC	Hospital-based HTA unit
Canada	E7/2016	Bellemare et al. ³²	University Hospital Center of Sherbrooke (H11)	Public university and specialized LHEBC	Hospital-based HTA unit
	E8/2017	Poder ³³			
	E9/2018	Poder et al. ³⁴			
	E10/2019	Poder et al. ³⁵			
	E11/2005	McGregor & Brophy ¹¹	McGill University Health Centre (H12)	Public university and specialized LHEBC	Hospital-based HTA unit
	E12/2005	McGregor ¹²	University of Montreal Hospital Center (H13)	Public university and specialized LHEBC	Hospital-based HTA unit and Internal committee
	E13/2019	Almeida et al. ¹³			
	E14/2016	Lepanto ³¹			
	E15/2016	Rhains et al. ³⁶	University Hospital of Quebec-Laval University (H14)	Public university and specialized LHEBC	Hospital-based HTA unit
E16/2016	Ungar ³⁷	Hospital for Sick Children Peter Gilgan Centre for Research and Learning (H15)	Public university and specialized LSH	Hospital-based HTA unit	
Kazakhstan	E17/2016	Kosherbayeva et al. ¹⁶	First General City Hospital of Astana (H16)	Private specialized LHEBC	Hospital-based HTA unit
	E18/2018	Avdeyev et al. ³⁸	Medical Centre Hospital of the President's Affairs Administration of the Republic of Kazakhstan (H17)	Private specialized LSH	Hospital-based HTA unit
Denmark	E19/2016	Kidholm & Ølholm ²⁹	Odense University Hospital (H18)	Public university and specialized LHEBC	Hospital-based HTA unit

(continue)

Box 1 (continued)

COUNTRY	STUDY/ YEAR	AUTHOR	HOSPITAL	SIZE AND PROFILE	ORGANIZATIONAL MODEL OF HOSPITAL-BASED HTA
Spain	E20/2016	Sampietro-Colom et al. ²⁷	Hospital Clínic i Provincial de Barcelona (H19)	Public university and specialized LHEBC	Hospital-based HTA unit
			Hospital Universitario Virgen del Rocío (H20)	Public university and specialized LHEBC	Hospital-based HTA unit and Internal committee
			Hospital Sant Joan de Déu Barcelona (H21)	Public university and specialized LHEBC	Internal committee
United States	E21/2010	Mitchell et al. ³⁹	Penn Presbyterian Medical Center (H22)	Private non-profit specialized LSH	Hospital-based HTA unit and Internal committee
Finland	E22/2016	Pasternack & Iris ⁴⁷	Helsinki University Central Hospital (H23)	Private non-profit university and specialized LHEBC	Stand-alone HTA or Mini-HTA
France	E23/2016	Barna et al. ⁴⁰	Paris University Hospital (H24)	Public university and specialized LHEBC	Hospital-based HTA unit
Netherlands	E24/2016	van der Wilt et al. ⁴⁹	Radboud University Medical Center	Public university LHEBC	Hospital-based HTA unit
Israel	E25/2019	Tal et al. ⁴¹	Yitzhak Shamir Medical Center – Assaf Harofeh (H26)	Public university and specialized LHEBC	Hospital-based HTA unit and Internal committee
Italy	E26/2005	Catananti et al. ¹⁴	Agostino Gemelli University Hospital (H27)	Public university and specialized LHEBC	Hospital-based HTA unit
	E27/2016	Marchetti & Cicchetti ¹⁵			
	E28/2016	Miniati et al. ⁴²	Florence Teaching Hospital – Careggi University Hospital AOUC (H28)	Public university and specialized LHEBC	Hospital-based HTA unit
	E29/2015	Manzi et al. ⁵⁰	Siena University Hospital (H29)	Public university and specialized LHEBC	Hospital-based HTA unit and Internal committee
New Zealand	E30/2014	Munn ⁴³	Auckland District Health Board – Auckland City Hospital (H30)	Public teaching and research specialized LHEBC	Hospital-based HTA unit and Internal committee
	E31/2016	Fitzgerald et al. ⁴⁴			
Singapore	E32/2016	Pwee & Chow ⁵¹	Changi General Hospital (H31)	Public university and specialized LHEBC	Internal committee
Sweden	E33/2016	Jivegård et al. ⁴⁵	Sahlgrenska University Hospital (H32)	Public university and specialized LHEBC	Stand-alone HTA or Mini-HTA
Switzerland	E34/2016	Grenon et al. ⁴⁶	Lausanne University Hospital (H33)	Public university and specialized LHEBC	Hospital-based HTA unit
			Lausanne University Hospital (H33)	Public university and specialized LHEBC	Internal committee
	E35/2016	Wasserfallen & Pinget ²⁸	Geneva University Hospital (H34)	Public university and specialized LHEBC	Internal committee
			Establishments of the Northern Vaudois Hospital (H35)	Private specialized LSH	Pioneer Model or Independent Group
Turkey	E36/2016	Kahveci et al. ³⁰	Ankara Numune Training and Research Hospital (H36)	Public teaching and research specialized LHEBC	Hospital-based HTA unit

HTA: health technology assessment; LHEBC: large-scale hospital with extra bed capacity; LSH: large-scale hospital; MSH: medium-sized hospital.

Note: E1 to E36: studies included in the review, number/year, reference, and year of study. H1 to H36: hospitals identified.

Source: prepared by the authors.

Table 1

Level of health technology assessment sedimentation in the hospitals identified in the studies included in the review.

Hospitals	Structures	Process	Results	Level of sedimentation
H1	0.5	0.5	0.5	1.5
H2	1.0	1.0	1.0	3.0
H3	1.0	1.0	1.0	3.0
H4	0.0	0.5	0.5	1.0
H5	0.0	0.5	0.5	1.0
H6	0.0	0.5	0.5	1.0
H7	0.0	0.5	0.5	2.0
H8	0.5	1.0	0.5	2.0
H9	1.0	0.5	1.0	2.5
H10	1.0	0.5	1.0	2.5
H11	1.0	0.5	0.5	2.0
H12	0.5	1.0	1.0	2.5
H13	1.0	1.0	1.0	3.0
H14	1.0	0.5	1.0	2.5
H15	0.5	1.0	1.0	2.5
H16	1.0	0.5	1.0	2.5
H17	1.0	1.0	0.5	2.5
H18	1.0	1.0	1.0	3.0
H19	1.0	1.0	1.0	3.0
H20	1.0	1.0	1.0	3.0
H21	1.0	1.0	1.0	3.0
H22	0.5	0.5	1.0	2.0
H23	0.5	0.5	0.5	1.5
H24	1.0	0.5	0.5	2.0
H25	0.5	0.5	0.5	1.5
H26	1.0	0.5	0.5	2.0
H27	1.0	1.0	1.0	3.0
H28	0.5	1.0	1.0	2.5
H29	0.5	0.5	0.5	1.5
H30	1.0	0.5	0.5	2.0
H31	0.5	0.5	0.5	1.5
H32	0.5	1.0	1.0	2.5
H33	0.5	0.5	1.0	2.0
H34	1.0	0.5	0.5	2.0
H35	1.0	0.5	0.5	2.0
H36	1.0	1.0	1.0	3.0

Note: H1 to H36: hospitals identified in the review. Structure, Process, and Result: 21 points were divided between the blocs, resulting in 7 points for each bloc. Score of 1 or 2 = 0.0; 3 to 5 = 0.5; 6 or 7 = 1.0 for the corresponding bloc. Level of sedimentation: sum of all the blocs. If 0.0 or 0.5 = incipient sedimentation; 1.0 or 1.5 = partially sedimented; 2, 2.5, or 3 = sedimented.

Source: prepared by the authors.

Sedimented hospitals

Among the 27 hospitals that presented sedimented level of HTA (Table 1), nine scored high in the final analysis (3.0 points) and presented hospital-based HTA units (H2^{9,24}, H18²⁹, H19²⁷, H27^{14,15}, and H36³⁰), internal committees (H3²⁴ and H21²⁷), or both models (H13³⁴ and H20²⁷) supported by the administration to develop reports and issue accessible and translated recommendations for decision-makers. Only H36 lacked totally formalized support for staff training and production of multidisciplinary activities³⁰. All the methods used for the production of reports and recommendations, adapted to the respective hospitals' contexts, were characterized as replicable to other hospitals, and with the implementation of HTA there was a reduction in costs and changes in the process of incorporation of technologies, with recognition and support by health professionals and administrators^{9,14,15,24,27,29,30,31}. Such hospitals presented at least six analytical dimensions in each of the structure, process, and outcome categories (Table 1).

The hospitals with sedimented HTA were from 14 different countries, namely Argentina^{9,24}, Brazil^{5,26}, Canada^{11,12,13,30,32,33,34,35,36,37}, Kazakhstan^{16,38}, Denmark²⁹, Spain²⁷, United States³⁹, France⁴⁰, Israel⁴¹, Italy^{14,15,42}, New Zealand^{43,44}, Sweden⁴⁵, Switzerland^{28,46}, and Turkey³⁰.

Canada had the most studies and hospitals with HTA. Ten studies from Canada reported on large-scale university hospitals with extra bed capacity (H11^{32,33,34,35}, H12^{11,12,13}, H13³¹, and H14³⁶) and one on a large university hospital (H15³⁷) with hospital-based HTA units. All these Canadian hospitals had sedimented HTA.

Italy presented three studies^{14,15,42}, two on large-scale university hospitals with extra bed capacity and sedimented HTA (H27^{14,15} and H28⁴⁴) with hospital-based HTA units, and one (H27) with partially sedimented HTA¹⁴ in 2000; by 2016, the latter hospital had reached the structure, process, and outcome categories, characterizing it as a context of sedimented HTA¹⁵.

In relation to Brazil, two studies reported experiences from three hospitals with public financing (H8, H9, and H10^{5,26}), one a large hospital and another large-scale hospital with extra bed capacity in teaching and research with hospital-based HTA units and a large-scale university hospital with a stand-alone HTA group or mini-HTA.

Of the six hospitals with more than one HTA organizational model, 83.3% (5/6) presented sedimented HTA (H13³¹, H20²⁷, H22³⁹, H26⁴¹, and H30^{43,44}).

Partially sedimented hospitals

Nine hospitals from six countries presented partially sedimented HTA (Table 1). In relation to the structure category, hospitals H4, H5, H6, H7, and H23 had stand-alone HTA groups without specific funding to produce studies or conduct quick reviews called mini-HTA^{25,47}. Only H23 reported the presence of a standard reporting form with formal criteria for planning, priority-setting, and translation of knowledge applied to the decision-maker's demands⁴⁷. All the partially sedimented hospitals (H1⁴⁸, H4, H5, H6, H7²⁵, H23⁴⁷, H25⁴⁹, H29⁵⁰, and H31⁵¹) reported having incomplete teams and stakeholders and/or mostly with the presence of physicians. In relation to the process category, no in-depth discussions were reported on the adaptability of the method used in the internal context of its external replicability^{25,47,51}. In relation to the outcome category, the partially sedimented hospitals presented partial results on the process of incorporation of health technologies^{25,47,48,49,50,51}.

Hospitals H1⁴⁸ and H25⁴⁹ had HTA units, but H1 did not report a fixed budget, trained teams, or administrative support in its unit⁴⁸. In the process category, both hospitals had a formal process with criteria for planning and setting priorities adapted to the local configurations of the clinical departments and hospital administration^{48,49}. Only H25 presented cost reductions and process improvements that resulted from the quality of the implemented technologies⁴⁹.

Hospital H29 had a hospital-based HTA unit that worked with an internal committee, but it did not report whether the organizational structure was formalized by the institution or whether there was a fixed budget for the unit⁵⁰. H29 had a multidisciplinary commission with collaborative working groups with other institutions to compare the territory's needs and assess the acquisition, rental, or disposal of health technologies. H29 has a formal HTA process and the production of studies for procedural support. The study reported a reduction in the costs and assessment of the mean prices for technology purchases⁵⁰.

Hospital H31 had internal committees with financing, but without integrated processes to support governance for the inclusion of new services and technologies⁵¹. They highlighted the presence of multidisciplinary teams qualified to conduct trainings and rapid reviews and to support other hospital committees and departments. They reported that they aimed to conduct efficient allocation of hospital budget resources and conduct analysis of evidence to formulate public policies on hospital technologies⁵¹.

All the hospitals with partially sedimented HTA in South Africa⁴⁸, Australia²⁵, Finland⁴⁷, Netherlands⁴⁹, Singapore⁵¹, and Italy⁵⁰ presented perspectives for the sustainability of HTA. In South Africa, there were provisions for coordinated efforts at the national, regional, and local levels⁴⁸. In the Australian hospitals, the authorities, organizations, and companies that supervised the private sector reported actively promoting the introduction of mini-HTA in public and private hospitals²⁵. In Finland, they reported national and local strategies for effectiveness in hospital decision-making, but also the need for more action in hospital practice⁴⁷. In the Netherlands, there is a large demand for hospital-based HTA in the production of important information to support the hospitals' clinical departments and boards⁴⁹. In the hospital in Singapore, HTA is in the initial phase, but the staff professionals are involved in the national and international HTA scientific community⁵¹. In Italy, there is an organization of hospital commissions, but it has still not been institutionalized⁵⁰.

Characteristics of the hospitals' action

All the hospitals drafted specific criteria that resulted in tools, sedimented and partially sedimented, derived from HTA reports, recommendations, and/or studies, considering feasibility, local knowledge, and the criteria set by the unit. Hospitals H4, H5, H6, H7²⁵, and H27, in their initial phase¹⁴, had specific criteria but with a process still in development and without standardization.

The principal method used by most of the hospitals was the HTA report. This tool can be based on technical aspects or evidence from reviews of the scientific literature for assessment of relevance and local applicability³². Recommendations are issued with simple, transparent, and accessible backing^{5,9,42} to sustain clinical practice and decision-making in hospitals. The tool's short version, called mini-HTA, features a brief assessment of the advantages and disadvantages according to a local report³². The reports can be submitted to national and international meetings, besides scientific reviews and abstracts published in information bulletin format^{24,36,40}.

In general, HTA processes should play an advisory role²⁹ to offer recommendations to the hospital administration in the process of acquisition or disposal of health technologies. In addition, more specific knowledge, adapted to the local context, may not offer replicability of the method to other institutions, as emphasized by the Centre Hospitalier Universitaire de Sherbrooke in Canada^{32,33,34,35}. In this hospital, the use of HTA created a specific organizational coherence with the local process, which resulted in partnerships between administrators, professionals, and patients' representatives to produce recommendations and develop policies, but which is not replicable to other contexts since it requires specific resources and skills to conduct the studies³⁵.

Barriers to the sedimentation of hospital-based HTA

Thirty-two hospitals, even those classified as sedimented, reported as the principal barrier the capacity to elaborate and maintain compliance with guidelines and local formalities for the implementation of hospital-based HTA^{5,9,11,12,13,14,15,16,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,41,42,43,44,45,46,47,50,51}. H1, H10, H24, and H25 were the only hospitals not to report installed capacity as a barrier^{26,40,48,49}.

Other aspects that limited and/or hindered the sedimentation of hospital-based HTA were reported by the hospitals, such as lack of transparency, planning, and speed in the acquisition of technologies (27/36); professional inertia and resistance to change (26/36); lack of adherence to HTA tools or other related procedures to support local decisions (21/36); insufficient training, orientation, and technical skills (21/36); lack of internal and external recognition (20/36); lack of administrative, financial, or government support (16/36); guarantee of decisions based on evidence, without untoward influences (13/36); administration discredited on collective decisions (13/36); scarcity of qualified evidence (11/36); and finally the lack of full-time work in HTA, related to staff time and turnover (8/36).

The hospitals' organizational models require constant resources for hospital-based HTA to contribute to quality and safety in the adoption of technologies. One study³⁴ cited the abandonment of innovative practices due to lack of financing, recognition, and/or follow-up of HTA processes.

According to the selected studies, the administrators that lack internal financing can opt, according to the context, for other sources of financing such as reimbursement for procedures²⁶; search for financing and hospital budget funds¹⁵; external financing³²; cross-subsidies^{27,37}; search for resources in health departments or regional boards^{16,44}; and financing from national organizations for HTA^{29,49}.

Discussion

This scoping review identified levels of HTA sedimentation in 36 hospitals, 75% (27/36) of which were classified as sedimented because they met criteria for structuring organizational HTA models, besides displaying stages in the HTA process and demonstrating implementation of practical results for the hospital level.

Practical results for hospital administration were related to the hospital staff's own capacity to demonstrate the value of the HTA in the sphere of hospital administration, and such teams also contributed to the overall coverage policies adopted in their countries. Hailey et al.⁵² and Favaretti et al.⁵³ corroborate these findings with studies on the impacts of HTA at the local and national levels. Novaes et al.⁵⁴ report that the adoption of decision-making processes, when included in value assessment structures, can lend more legitimacy to both the decisions and the prioritization of technologies.

The allocation of fixed resources for the organizational models was specified in 17 hospitals with sedimented HTA. This finding was corroborated by Attieh et al.⁵⁵ in a systematic review that reported effects and repercussions of the adoption of HTA by hospitals, showing that by producing savings for the hospitals, HTA demonstrated the importance of continuing the work by dedicated professionals with appropriate organizational models.

The sustainability of support and administrative commitment to hospital-based HTA structures were key factors for internal and external growth according to some studies^{9,24} on experiences with hospital-based HTA. These factors were also confirmed by Francisco & Malik⁷, who analyzed the experience of HTA groups in Brazil, reporting that the sustainability of hospital-based HTA over time is related to reinforcement of the hospital's strategic management.

According to the experience of other HTA initiatives in Brazil, sustainability requires continuous investments to increase production, continuing education, and adherence, legitimizing the administrative acts, which should be directed to relevant HTA policies for the respective context^{5,6}.

The process of defining criteria for ordering HTA reports and issuing recommendations was present in 14 of the hospitals. The problems included lack of formalization, which opened the way for conflicts of interest and mistrust⁴⁷, and outside influences in issuing recommendations²⁸. Grenon et al.²⁸ reported that these problems occur when there are no standardized procedures for developing HTA reports, and that these processes need to be developed formally in the local context.

Study limitations

The scoping review identified experiences in articles published in Brazilian and international journals, but no technical visits or interviews were conducted with key informants in the respective hospitals. It was thus an exploratory study. Although the strategy included enhanced search, manual search, and searches in the proceedings of specialized conferences in the HTA field, many of the abstracts published in the proceedings of these scientific events could not be used because they lacked complete information on the respective hospitals. The scoping review only selected studies that addressed HTA specifically in a hospital context and excluded studies that dealt with the topic at the national or general levels, but without citing each hospital's unique experiences. The articles' data extraction was performed by a single author, but it was reviewed in meetings with the other authors to clarify doubts on classification of the sedimentation dimensions. Some hospitals may have been misjudged in the assessment due to lack of specific information on the structure, process, and outcome of HTA in the hospitals, although the authors had searched for information on the hospitals' own websites.

Practical implications

The study contributed to structuring HTA activities in hospitals in the Brazilian Unified National Health System (SUS). Knowing the experiences and level of sedimentation of hospital-based HTA in the domestic and international contexts contributed to a better understanding of the field, since the studies in the scoping review pointed to sustainability, growth, and evolution of hospital-based HTA in countries with and without a tradition in the field. Thus, the study presented dimensions that will serve as the basis for mapping installed capacities in hospitals and new studies on HTA in hospitals.

Conclusions

This scoping review showed dimensions and levels of sedimentation in 36 hospitals that adopted HTA in their management processes, identified via an extensive search of Brazilian and international experiences. Most were classified as having sedimented HTA because they met criteria for structuring HTA organizational models, displayed stages in the HTA process, and demonstrated practical results at the hospital level. The review also revealed challenges throughout the entire process of sedimentation of hospital-based HTA, ranging from the implementation of new clinical and management practices to sustainability of the structures and processes over time.

In hospitals with partially sedimented HTA, the initial barriers pertaining to structural aspects were related to the available financial, physical, and human resources and adherence to HTA tools applied to the context of strategic management. In hospitals with sedimented HTA, the main barrier was to give impact to the results, explained by the scarcity of evidence for the target topics, the lack of continuing training, and noncompliance with the established guidelines in the assessment and decision process, influencing the internal and external recognition of the results obtained with HTA. We hope that the target dimensions and the findings will serve as the basis for creating strategies for HTA implementation in hospitals.

Contributors

J. P. S. Galdino, E. B. Camargo and F. T. S. Elias contributed to the conception and design, analysis and interpretation of data, in the writing of the article, relevant critical review of the intellectual content and in the final approval of the version to be published. The authors are responsible for all aspects of the work to ensure the accuracy and completeness of any part of the work.

Conflict of interests

The authors hereby state that they have no conflicts of interest related to the study.

Additional informations

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Resumo

O objetivo do estudo foi analisar o nível de sedimentação da avaliação de tecnologias em saúde (ATS) hospitalar em diversos contextos. Foi realizada revisão de escopo segundo metodologia do Instituto Joanna Briggs, cujo modelo de análise dos dados foi composto pela combinação das dimensões de estrutura, processo e resultado de Donabedian e das dimensões do projeto Adopting Hospital Based Health Technology Assessment in European Union (AdHopHTA). Foram identificados 270 estudos, após remoção de duplicatas e leitura de textos completos, 36 referências atenderam aos critérios de elegibilidade. Trinta e seis hospitais foram identificados, sendo 24 hospitais de grande porte com capacidade extra de leitos. Vinte e três hospitais tinham vínculos universitários. Destaque ao Canadá, com cinco hospitais universitários, sendo quatro com financiamento público. Metade dos hospitais identificados tinham unidades de ATS hospitalar (18/36). Hospitais com nível sedimentado corresponderam a 75% (27/36) e parcialmente sedimentado a 25% (9/36). Não houve hospital com sedimentação incipiente. Mensurar o nível de sedimentação da ATS nos hospitais identificados contribui para o entendimento de como a inserção ocorre no campo da ATS hospitalar. Neste estudo, mostrou-se a importância de identificar fatores como sustentabilidade, crescimento e evolução da ATS hospitalar em países com e sem tradição com o tema.

Avaliação da Tecnologia Biomédica; Hospitais; Gestão em Saúde; Tomada de Decisão; Governança

Resumen

El objetivo del estudio fue analizar el nivel de sedimentación en la evaluación de tecnologías de salud (ATS) en hospitales dentro de diversos contextos. Se realizó una revisión de alcance, según la metodología del Instituto Joanna Briggs, cuyo modelo de análisis de datos estuvo compuesto por la combinación de las dimensiones: estructura, proceso y resultado de Donabedian, así como las dimensiones del proyecto Adopting Hospital Based Health Technology Assessment in European Union (AdHopHTA). Se identificaron 270 estudios, tras la eliminación de duplicados y lectura de textos completos, 36 referencias atendieron a los criterios de elegibilidad. Se identificaron treinta y seis hospitales, 24 de los cuales, de gran porte, con capacidad extra de camas. Veintitrés hospitales contaban con vínculos universitarios. Canadá merece una mención especial, con cinco hospitales universitarios, cuatro de los cuales con financiación pública. La mitad de los hospitales identificados tenían unidades de ATS hospitalaria (18/36). Hospitales con un nivel sedimentado correspondieron a un 75% (27/36), y parcialmente sedimentado a un 25% (9/36). No hubo hospital con sedimentación incipiente. Medir el nivel de sedimentación de la ATS en los hospitales identificados contribuye al entendimiento de cómo se produce la inserción en el campo de la ATS hospitalaria. En este estudio, se mostró la importancia de identificar factores como: sostenibilidad, crecimiento y evolución de la ATS hospitalaria en países con y sin tradición en este ámbito.

Evaluación de la Tecnología Biomédica; Hospitales; Gestión en Salud; Toma de Decisiones; Gobernanza

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