

# HOSPITAL-BASED HEALTH TECHNOLOGY ASSESSMENT IN BRAZIL: AN OVERVIEW OF THE INITIAL EXPERIENCES

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**Objectives:** Hospital-based health technology assessment (HTA) has become increasingly important in Brazil due to its strategic importance to promote adoption, incorporation, dissemination, and disinvestment of technologies. A strategy to foster hospital-based HTA was implemented in 2009 by creating hospital-based HTA nuclei (NATS) at university hospitals and other strategic hospitals.

**Methods:** Between 2011 and 2012, we interviewed board members in twenty-three NATS located in all geographic regions of Brazil to assess their general characteristics, scientific output, and challenges.

**Results:** Of the total, 65 percent of the NATS belonged to teaching institutions, with 44 percent associated with federal universities. The bulk of their output was in the form of mini-HTA reports. Centers in the Southeast and South of Brazil had the highest production compared with other regions. Lack of expertise and low levels of advanced training were identified as limiting factors in the majority of centers.

**Conclusions:** The experience of the initial twenty-three NATS could be considered positive and has led to the creation of new ones around Brazil. Regional disparities in workload, production, and technical training should be targeted by new policies toward hospital-based HTA in Brazil. The limits and possibilities for intensifying the strategy relate to continuous investment in priority studies, which simultaneously, allow professionals who work in hospitals to receive continued education and produce relevant HTA work in a timely manner.

**Keywords:** Hospital-based health technology assessment, Mini-HTA reports, Models of HTA practice, Developing countries

The use of health technology assessment (HTA) has become an indispensable part of health system governance as a result of economic and technological pressures, expanding since the 1970s in developed countries (1). HTA supports decision making on procedure coverage, resource allocation, and clinical guidelines. These processes take into account the effectiveness, costs, budget impacts, and the organization of the healthcare services (2;3). International experiences in nine countries corroborate that hospital decision making guided by HTA is increasing. To a greater extent, in developing countries, this ability is still limited to managers and technical bodies of the hospitals (4).

In Brazil, during the 1980s, the focus of the activities in HTA was restricted to universities (5). The implementation of a specific area at the Ministry of Health occurred in 2005, so as to guide appropriate use of the health technology assessment into the decision-making process by the central government (6). Furthermore, a research and practice network was created with the purpose of using the best available evidence and to standardize methods. It was called Brazilian Health Technology Assessment Network (REBRATS) (7). Later on, in 2008, the first hospital-based HTA nuclei (Núcleos de Avaliação de Tecnologias em Saúde, known by the acronym as NATS) were formed, as a result from the efforts and strategies carried out by the

REBRATS Professional Training and Education Advancement Work Group. In 2009, a public call for grant proposals was published aiming to help implement the NATS (8). The goals were to disseminate HTA in teaching hospitals and introduce the HTA rationale in hospitals that provide medium and high complexity services. The production of evidence-based clinical guidelines and mini-HTA assessments was expected from the centers that had been funded by that grant. Nevertheless, an online survey carried out by the Ministry of Health in 2010, just after 2 years of the call for proposals, showed lack of training and funding for sustaining actions (9).

This study aims to describe the results from an in-person survey carried out in 2012 aimed at describing the situation and the experience of the first Brazilian NATS in their initial period of implementation, which occurred from 2009 to 2011.

## MATERIAL AND METHODS

In 2012, there were twenty-four NATS located in all regions of Brazil. Our research protocol was to interview all of them. However, one NATS refused to participate in the study, so the final number of NATS visited and interviewed was twenty-three. In-person interviews were conducted. A board member from each NATS was invited to participate in the research and answer

a questionnaire developed and tailored at describing the characteristics and situation of each NATS (Supplementary File 1). The data collection instrument (questionnaire) contained structured and semi-structured questions. In this study, we analyzed the structured part of the questionnaire.

The questionnaire was made up of nine blocks of questions dealing with the following themes: general identification, hospital to which it belonged to and care profile, contextualization of the group within the hospital, technical expertise and physical structure, production of mini-HTA, methods used in the assessments, HTA training received, how activities had been financed, and limits and possibilities of their work. In Brazil, mini-HTA is considered a review, which takes approximately 2 to 3 months to be completed and is composed by short literature reviews emphasizing systematic reviews published in national and international peer-reviewed journals (10).

The questionnaires were previously sent by email to the interviewees, along with a study description and presentation letter, allowing the research subjects to become familiar with the study proposal and to give them the opportunity to think through the questions beforehand. The interviewers had prior knowledge of HTA and its methods and received training regarding the questionnaires. The interviews were carried out at the hospitals in the NATS' offices. The interviews were audio recorded when permission was granted.

After the interviews, the information was stored and systematized on a database. The descriptive analyses were performed using R Software (version 3.1.3). The study was submitted and approved by the Internal Review Board (CEP/ENSP), approval number 93,698. Funding came from the Ministry of Health and Fiocruz (Projeto de Fortalecimento da Rede Brasileira de Avaliação de Tecnologias, 2011–2013).

## RESULTS

From the twenty-three NATS visited, sixteen (70 percent) were located in reference hospitals that cared for patients within multiple specializations, such as pediatrics, cardiology, and neurology. The other seven (30 percent) were hospitals with a single specialization. Of the total, 15 (65 percent) of the NATS belonged to teaching institutions, with ten (44 percent) associated with federal universities. Four NATS (18 percent) had cooperative agreements with other types of institutions.

As for NATS duties in relation to the hospital in which they were located, thirteen (57 percent) reported giving an account of their actions in periodic public meetings, six (26 percent) delivered annual reports, two (9 percent) gave monthly activity reports, two (9 percent) did not register providing direct feedback to the hospital, and one (4 percent) presented feedback to another organization other than the hospital. Table 1 highlights the scientific production by the means of mini-HTA reports in the geographic region where they were located.

**Table 1.** Number of NATS by Geographic Region in Brazil and Number of NATS That Produced HTA Reports (at Least One) and % by Geographic Region of Brazil (2009-2011)

Region of the country	No. of NATS <sup>a</sup>	No. of NATS that produced HTA reports (%)
Northeast	6	2 (33.3)
Southeast	10	4 (40)
Center-West	3	1 (33.3)
North	2	1 (50)
South	2	2 (100)
Total	23	10 (43.5)

Note. Source: NATS Survey.

<sup>a</sup>Number of NATS between 2009 and 2011.

**Table 2.** Work Demands of NATS from the Ministry of Health and the Hospital by Geographic Region of Brazil (2009-2011)

NATS per region (n) <sup>a</sup>	No. of NATS that reported receiving demands from the Ministry of Health (%)	No. of NATS that reported receiving demands from the hospital it belonged (%)
Northeast (6)	0 (0)	2 (33.3)
Southeast (10)	3 (30)	4 (40)
Center-West (3)	1 (33.3)	0 (0)
North (2)	0 (0)	1 (50)
South (2)	2 (100)	1 (50)
Total (23)	6 (26.1)	8 (34.8)

Note. Source: NATS Study.

<sup>a</sup>Number of NATS by geographic region (period 2009-2011).

### Scientific Production

When we compare the scientific production of mini-HTA in the NATS from different geographical regions of Brazil, the Southeast, South, and Northeast had the highest absolute numbers. However, considering the number of NATS, overall, ten (43.5 percent) of them produced at least one mini-HTA. Eighteen (79 percent) NATS reported having ever elaborated mini-HTA for pharmaceuticals, seven (30 percent) for medical devices and three (13 percent) for vaccines or other immunobiologicals.

### Internal and External Demands for Mini-HTA

According to our interviews (Table 2), eight NATS (35 percent) reported receiving internal demands for mini-HTA. Such demands could relate to hospital management, pharmacy, or therapeutic commissions concerning technology acquisition and other needs. As for meeting Ministry of Health demands, only six (26 percent) of NATS answered that they had received such requests.

### Capacity Building for HTA

Only eight (35 percent) NATS had been active before the 2009 public call for grant proposals was launched. With respect to the work staff, 22 percent of respondents (five NATS) reported more than 2 years of activity in the area. As for number of staff, six NATS (26 percent) had more than ten professionals engaged in HTA activities. Regarding these professionals involved in health technology assessment, workers from eighteen NATS (78 percent) had received some kind of internal training.

Sixteen (70 percent) NATS visited received some kind of incentive from other departments within the hospital to conduct HTA studies, such as from the pharmacy department. This support aimed to establish effectiveness parameters or to offer support to clinical guidelines.

In terms of receiving external financial resources, thirteen (56 percent) NATS reported having received grant money for their initial establishment. It was also found that fourteen (60 percent) NATS were exclusively maintained by the institution to which they were linked, four (17 percent) by some form of external funding, and six (26 percent) had not received any financial support after the initial grant. From these external resources, twelve (52 percent) of the NATS mentioned having submitted proposals for HTA-directed calls for grants from the National Agency for Scientific and Technological Development.

## DISCUSSION

These results indicate that, for the most part, the NATS were located in specialized hospitals and had received external financial support by means of research grants or other forms of public financing. The majority of NATS production was in the form of mini-HTA reports. This number contrasted with the low number of NATS receiving demands from within the hospitals, perhaps reflecting that hospitals may give incentives to NATS existence within the hospital but may not demand any research from them. Further research needs to address the root causes of this peculiar interaction. Despite efforts to interiorize the NATS to North and Northeast regions, the Ministry of Health had concentrated its research requests to NATS located in the Southeast and South regions.

A limitation of our study lies in the fact that we did not assess the quality of the work produced by the NATS. Furthermore, the lowest level of disaggregation we could display for our data was the geographic regional level. This was done to avoid a situation in which individual NATS would be identified if more disaggregated analyses had been presented. Despite these limitations, the results from this study can contribute to other developing countries, which have yet to implement hospital-based HTA as we have identified some barriers to the implementation and work of NATS.

### Comparison with the Literature

Our study showed the important role of mini-HTA as an important scientific output delivered by NATS. This finding is in accordance with other studies carried out in Brazil and in other countries. For instance, mini-HTA also represented 19 percent of the Brazilian HTA studies published between 1990 and 2012 (37/192), according to a study performed using the REBRATS, Scielo, and Center for Review and Dissemination (CRD) databases (11). These numbers took into account the publications in academia and other research institutions. Furthermore, public university institutions were responsible for half of total production of mini-HTA (11). Another study from 2008 to 2010, revealed that, out of the 113 studies produced by the Brazilian Ministry of Health, 26 were mini-HTA (12).

An international survey (13) demonstrated that six countries (Australia, Canada, Denmark, Spain, Sweden, and United States) use mini-HTA systems to support decision making in hospitals. This assessment is based upon the same rationale used for complete HTA analyses, but with a simplified execution process and content (14). Another international survey showed an increased implementation of this tool inside hospitals (15).

International experiences have shown growing HTA use in hospital settings, with application in medical device analysis (16;17), creation and maintenance of hospital databases that nurture effectiveness assessment (18), and support from hospital-based HTA professionals for national-level decision making (19). In Brazil, we identified that hospital-based HTA was more focused on pharmaceuticals than in medical devices or vaccines.

There are countries, such as Italy, Spain, France, and Canada, that stand out for their pioneering use of HTA in influencing hospital resource allocation for innovative technologies (20;21). In Brazil, according to our results, resource allocation based on hospital-based HTA was increasingly being used to support adoption and incorporation decisions.

Initiatives in Latin America and Asia show that there are challenges for HTA due to the limitations on HTA policies and shortage of human and financial resources (22). Our survey showed the necessity of HTA training and resources in NATS. However, the experience of an Argentinean public hospital has shown 10 years of production with clinical guidelines and HTA for decision support. This stresses that HTA programs can be feasible in public hospitals in a context of limited resources (23).

A systematic review of eighteen studies (24) showed four types of HTA programs for hospital-based HTA: ambassador model, mini-HTA, internal committee, and HTA unit. Each of these needs specific structures and resources. Overall, studies showed positive impacts for the decision-making process and the ability of cost savings and improved budget planning. Additionally, managers and clinicians have described positive perceptions about these HTA programs (24). The Brazilian NATS

model seems to fit the mini-HTA program best, so continuous efforts should be made to provide training to staff in this kind of method.

The limits identified in countries that had extensive experience with hospital-based HTA related to clinicians' steep learning curve when adopting assessment instruments. Another challenge consisted in achieving quality standards for the assessments produced when compared with the methods standardized by the European HTA network (25;26). Such steep learning curves may also be related to the low levels of scientific production by NATS in Brazil.

### Setting

The university and other research hospitals where Brazilian NATS were created play an essential role in the Brazilian Network for HTA (REBRATS). The National Commission for Technology Incorporation in the SUS (CONITEC - Law 12.401/2011) has worked toward improved partnerships with the existing NATS and also fostered the creation of new ones (8).

### CONCLUSIONS

The efforts undertaken to promote and support a hospital-based HTA culture in Brazilian hospitals have yielded an increase in the capacity of professional staff, especially in relation to producing mini-HTAs, with the highest output concentrated in the country's South and Southeast regions. The experience of the first twenty-three NATS could be considered positive, and it has led to the creation of new ones in Brazil after the initial phase assessed in this work (26). Nevertheless, our findings showed disparities among and within regions, as we observed NATS that were having difficulties in fulfilling their purpose. New policies toward hospital-based HTA in Brazil should aim to diminish such disparities and offer more training and staff. The limits and possibilities for intensifying the strategy relate to continuous investment in priority studies for the Brazilian health system (SUS), which would simultaneously allow professionals who work in hospitals to receive continued education and develop relevant HTA work.

### SUPPLEMENTARY MATERIAL

Supplementary File 1:

<https://doi.org/10.1017/S0266462317000459>

### CONFLICTS OF INTEREST

The authors have nothing to declare.

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