

**Organizational Models of Hospital Based HTA: Evidence from AdHopHTA European Project**

**(Topic & Track: “*Organization: Theory and Design*”)**

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## **Introduction**

The decision making process on uptake of health technologies has become a relevant topic in the healthcare systems. A great interest toward the main characteristics of the process itself, as well as of the actors and competencies involved in the evaluation activities, emerged at the different levels. Health Technology Assessment (HTA) is more and more used as a managerial tool to ensure an accountable decision about introducing, disinvesting or reallocating health technologies. More in particular, even if in different ways, many countries are experiencing several forms of Hospital Based HTA (HB-HTA), which consists in “the implementation of processes and methods of health technology assessment at hospital level” (AdHopHTA European Project, 2012). Such contextualization is applied according to the specificity of the hospital organization, bringing into the assessment process “the consideration of its unique characteristics, such as the choice of an available comparator and the specific organizational patterns of the hospital” (AdHopHTA European Project, 2012). HB-HTA thus became the most recognized methodology to support managerial decision making and to define the technological strategies for hospitals (Cicchetti, 2003; Cicchetti and Fontana, 2008).

## **Theoretical Background**

Recently, hospital organizations experienced the increasing need of HTA evaluation to support managerial decision making at local level (Cicchetti and Fontana, 2008). Prior literature identified two different phenomena encouraging such trend. The first one relates to the budget constraint policies that organizations have to comply with, ensuring, at the same time, the efficacy and quality of interventions. Such accountability is assigned at local level specifically (Lafortune et al., 2008). The second phenomenon regards the awareness of the contextual factors which can influence dramatically the success of a specific technology (Cicchetti and Fontana, 2008). The interaction between the technology and the organization is thus able to influence the advantages and opportunities deriving from the innovation process. Management literature widely discussed this relation also in the healthcare settings (Barley, 1986) and several models explaining this interaction emerged (Orlikowski, 1992). The first referred to the “Technological Imperative”, according to which the technology independently affects the organizations and human actions. In this body of literature, technology is investigated in terms of its impact on organizational variables, such as “structure, size, performance and centralization/decentralization”, as well as “job satisfaction, task complexity, skill levels, communication effectiveness, and productivity”. The effects on social structure and goals (Hage and Aiken, 1969), as well as differentiation, spans of control and decentralization of decision-making authority (Blau et al., 1976) have also been discussed. The second model, well known as the “Strategic Choice Model”, investigated the role of the technology as “a product of ongoing human action, design

and appropriation” (Orlikowski, 1992). Regardless the proposed model, even when the technology is intended as an exogenous element in the organization, its effects in the organizational structure has been somehow recognized (Orlikowski, 1992).

Experiences of international comparison among the design and the activities of the HTA units have been already documented (Martelli et al., 2007; Cicchetti et al., 2008). The aim of this study is to contribute with empirical knowledge to this research area by identifying and critically appraising the existing organizational models for HB-HTA at hospital level. We explored different characteristics and elements of HB-HTA units in European Hospitals and investigated how they accommodates to strengthen the impact of desirable and amend undesirable technologies.

## **Methodology**

Data used in this study was gathered within European Project AdHopHTA, granted under the 7th Framework Research Programme, which is aimed at strengthening the use and impact of HTA in hospital settings. Data collection was performed on the field using two different sources: (i) a semi-structured interview, in order to inquire several aspects characterizing the organizational model of HB HTA units and (ii) official documentation from each hospital where available. Case studies were built deriving information from these data sources and case study method (Yin, 2003) has been applied to appraise similarities and differences among cases. Since case studies were aimed at describing the organizational model of HB-HTA, each organization model investigated represented the object of a single case study.

## **Results**

Seven case studies on seven HB-HTA units across countries (Italy, Spain, Denmark, Finland, Turkey, Switzerland, New Zealand) have been analyzed. Background characteristics of the hospital investigated are reported in Table 1.

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Table 1 about here

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Case studies synopsis is exhibited in Table 2.

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Table 2 about here

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HB-HTA units show different organizational arrangements in terms of use of authority and centralization/decentralization of power, specialization of labour, formalization of procedures, level of personnel qualification. Organizational models adopted by units' leaders seem to depend by some "contingent" variable, such as the size of the unit (essential vs big sized), the stage of development of the unit (mature vs early stage), their mission/vision (internal vs external orientation), the heterogeneity of professional competencies (Focused vs Broad), the relevance of the institutional environment in HTA (collaboration with national/regional levels; relevant vs irrelevant).

Table 3 shows major contingent variables and their impact on organizational parameters.

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Table 3 about here

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Table 3 shows how the context in which HB-HTA units are embedded (e.g. environment, mission, etc.) can impact on the organizational structure. For example, the analysis shows how if the institutional environment is characterized by strong national-regional HTA bodies, then a functional collaboration between hospital level and national-regional HTA bodies is more likely to occur. Some of the structural variables seem to be particularly relevant and tend to characterize the organizational model. More specifically, the different combination of (i) formalization/specialization and (ii) level of integration, permits to identify four different ideal-types of HB HTA functions. Regarding the first structural variables (level of formalization and internal specialization), highly specialized units tend to be more formalized (they operate using formal procedures). A highly specialized unit, is one that is able to manage different HTA processes dedicating to those processes specific competencies and/or specific formal procedures. Specialization is needed to manage different tasks (e.g. HTA for drugs, devices, a three-years investment plan for health technologies). Usually "mature" HB-HTA functions tend to be more formalized and highly specialized. On the other hand, some of the less "mature" HB-HTA functions prefer to maintain flexibility, being less specialized and

formalized. In these units the same people manage different tasks using more homogenous (same form/template used for different technologies) and less formalized procedures.

Regarding the dimension “level of integration”, two are the typical modes of this variable. Integration is high if the unit is creating multiple linkages with other organizations/institutions that are doing HTA at other institutional levels (labelled as “allies”). Of course this integration can be based on formal agreements or informal collaborations.

The combination of this couple of two-modes variables define the contingency model (Daft, 2007) presented in Figure 1.

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Figure 1 about here

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The Integrated-specialized HB-HTA functions are embedded in a context characterized by the presence of national-regional HTA bodies or functions belong to this category. Even if they gain relevant autonomy, their action is influenced by the opportunity of creating formal (or occasionally informal) collaborations with these bodies. They present high level of formalization and their activity is also recognized within their respective hospitals. Potential examples of this group are the units investigate in Danish and Finnish hospitals.

The Stand-alone HB-HTA functions are mainly focused on internal processes and are embedded in a context in which national regional bodies are not present or are not generating specific influence on the HB-HTA function belong to this group. In this area, more mature units with highly formalized and specialized procedures are found. Italian and Spanish units belong to this group.

The integrated-essential HB-HTA functions which are “essential” in their organizational model belong to this category. They are characterized by a limited number of collaborators that are able to involve many other actors and “allies” in their activity. They are embedded in a system of collaborations, that include universities and research centres, that can provide the competence and workforce useful to manage processes. Turkish and Swiss units investigated could be considered in this group.

Finally, when the level of integration with the context is low as well as the level of structuring, the unit is operating within the hospital as a sort of Independent group that is providing support to management decision in a fairly informal manner. In general this is the first stage of the development of an HB-HTA function. In this scenario, the hospital top management is not fully aware about the usefulness of HTA to support decision making and some “pioneers” are acting on a voluntary basis, they are not full

time dedicated to HTA, but they are working to demonstrate how an HTA approach could be useful in hospital management. It seems that the investigated unit in New Zealand is representing this option.

These four groups should be considered as ideal-types and none of them is able to capture the real complexity of units belonging to one of the four options. Nevertheless, the model communicates, at least, the richness of available solutions to run an HTA function within a hospital. The model can also describe a sort of organizational life-cycle for HB-HTA functions: start-up units, in general, are informal and less connected with the external environment (Independent groups). People are working part-time, on a voluntary basis without strong formal endorsement from management and with informal procedures. The presence or absence of national/regional HTA bodies acting as hub of an HTA network, influences the evolution of the unit toward an integrated or a stand-alone solution. The evolution towards a more mature HB-HTA function is characterized by increasing levels of formalization and structuring in the processes and the progressive alignment between the strategies and goals pursued by the HTA function and hospital-level strategies. In this evolution, the HB-HTA function gains internal and external legitimacy until it is fully recognized as a key actor for hospital's development strategies and it is also considered as a partner at national-regional level.

### **Conclusion and Discussion**

These findings can be interpreted as a reference standard to run a HB-HTA function in different stages of maturity, since they shed new light on how significant experiences of HB-HTA functions carry out their activity in Europe. The description of the "state of art" of the HB-HTA organizational models could help HTA experts and professionals in improving their own HB-HTA function or starting a new one at hospital level. The recognition of the existence of a sort of evolution path for HB-HTA functions could be also useful to manage the evolution and development of an HTA unit at hospital level.

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**Table 1: Seven Case Studies. Background information of the studied hospital.**

	<b>Establishment (YEAR)</b>	<b># Personnel FTE</b>	<b># Physician FTE</b>	<b># Staffed beds</b>
<b>Turkey</b>	2012	3.000	921	1.140
<b>Italy</b>	2001	4.500	950	1.300
<b>Denmark</b>	2002	6.000	NA <sup>1</sup>	1.100
<b>Spain</b>	2009	4.500	600	666
<b>Finland</b>	2012	21.751	2.860	2.831
<b>Switzerland</b>	2002	8.562	1.470	1.463
<b>New Zealand</b>	2005	7.800	1.400	1.245

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<sup>1</sup> No answer provided

**Table 2. Cases Synopses**

	Turkey	Italy	Denmark	Spain	Finland	Switzerland	New Zealand
Year of birth	2012	2001	2002	2009	2012	2002	2005
Personnel fully dedicated to HTA activities	Leader: NO People: NO	Leader: NO People: YES	Leader: NO People: YES	Leader : YES People: YES	Leader: NO People: NO	Leader: YES People: NO	Leader : NO People: NO
Clear definition in the organizational chart	NO	Staff to Medical Directorate	NO	Staff to Medical Directorate in the innovation directorate	NO	In the medical directorate	Independent group in under CMO
Formal Alignment to further HTA Strategies	NA	European; Hospital	Hospital	European, National, Hospital	European, National, Hospital	Hospital	Hospital
# of people	12	9	6	3	7	2	14
People (Leader)	(Clinician) • 1 Health Economy • 5 clinicians • 3 managers • 1 nurse • 1 pharmacist	(Clinician) • 2 Health Economists • 1 Biostatistician • 1 Information Specialist • 2 Biomedical Engineers • 1 Pharmacist • 1 Ethicist	(Health Economist) • 2 Health Economists • 1 Biomedical Engineers • 3 Public Health Specialists	(Clinician) • 1 Health Economist • 1 Public Health Specialist	(Clinician) • 5 Clinicians 1 Hospital Manager	(Health Economist) • 1 Health Economist	(Surgeon - public health specialist) • 1 Health Economist • 12 Clinicians
Part Time Competences	10 PTE + Leader PTE	1 ethicist consultant	6 PTE + Leader PTE	No PTE	7 PTE	1 PTE	3 + Leader PTE; 10 consultants
Selection and recruitment	Voluntarily	Unit specific	Hospital process	Hospital process	Unit Specific	Hospital process	Unit specific

	Turkey	Italy	Denmark	Spain	Finland	Switzerland	New Zealand
Career Development programs/initiatives	NO	YES	YES	YES	NO	NO	YES
People Performance Evaluation	Hospital tool, production	Yes, Scorecard	NO	NO	NO	NO	Yes, Performance Appraisal and Absenteeism
Formalized Procedures describing the adoption process of HTs	Mainly YES	Mainly YES	YES	YES	YES	YES	Mainly No
Involvement of the HB-HTA function in the adoption process of HTs	Mandatory	Mandatory	Mandatory (not systematic)	No but highly recommended	Mandatory	Mandatory	Mandatory
Recommendation	Yes (Advisory)	Yes (Advisory)	No	Yes (Advisory)	Yes (Advisory)	No	Yes (Advisory)
Involvement of the function in the implementation	NOT SYSTEMATIC	NOT SYSTEMATIC	NO	NO	NO	NO	NO
Follow up process on implementation of results	YES	YES	NO	NO	NO	NO	YES

	Turkey	Italy	Denmark	Spain	Finland	Switzerland	New Zealand
Actors involved in the HTA process	Physicians, nurses, pharmacists, financial office, HB-HTA function	Pharmacy, financial department, committee for purchases, clinical directorates	HB-HTA function, clinical department librarian	HB-HTA function, Applicant Clinicians head of economics of clinical departments, infrastructure people, people from organization, nurse	Physicians	Applicant physician, HTA unit, head of financial department, head of clinical departments, medical directors financial department CEO	HB-HTA function
Formalization of the involvement	Not formalized	Not formalized	Formalized	Formalized	Formalized	Formalized	Formalized
Application Form	No (Main applicant: CEO)	YES	NO	YES (but rarely used)	YES	YES	YES
Review of processes and activities	Not systematic	Not systematic	NA	Not systematic	Not systematic	Not systematic	Systematic
PICO	YES	YES	YES	YES	YES	YES (but not formally described as PICO model)	YES
Comparator	Standard of Care, current technology available at the hospital	Standard of Care; Indirect comparison	Standard of Care	Current technology available in the hospital	ALL	Standard of Care; Indirect Comparison; Alternative Scenario	the current technology available at the hospital
Perspective	Hospital	Hospital, Patient, Third Payer	Hospital	Hospital	Hospital	Hospital	Hospital, Patient, Third Payer

	Turkey	Italy	Denmark	Spain	Finland	Switzerland	New Zealand
Total Number of HTAs assessed per year (AVERAGE)	3.0	30.0	8.3	5.0	2 (20)	4.8	8.3
Reports per Person (average from May 2013 to May 2014)	0.31	9.00	2.86	1.67	2.00	5.33	1.00
Specific budget for operational costs	NO	NO	NO	NO	NO	NO	YES
People Paid by Specific budget	NO	YES	NO	NO	NO	NO	YES
Strategy for Additional Funds	NO	YES	YES	YES	NO	NO	NO
Prioritization Criteria	NO	YES	NO	YES	NO	NO	YES
Links with Key allies <sup>2</sup>	1 Informal	Formal, Mainly temporary	Mainly Formal	Informal, Mainly Temporary	Mainly Informal, All Permanent	Mainly Formal Permanent	Informal, Mainly Temporary
Participate in training activity	YES	YES	YES	YES	YES	YES	YES
Organization of training activity	NO	YES	YES	YES	NO	NO	YES
Evaluation of impact of dissemination	YES – Not systematic	YES – Not systematic	YES – Not systematic	YES – Not systematic	YES (for the MUMM program)	YES (OCCASIONAL Y)	YES – Not systematic
Performance indicators for the Function	NO	NO	NO	NO	NO	NO	NO

<sup>2</sup> Please intend as key allies: (i) National/Regional bodies, (ii) Research centres, (iii) Universities/faculties; (iv) Health Policy Institutions; (v) Other Healthcare Organizations.

	Turkey	Italy	Denmark	Spain	Finland	Switzerland	New Zealand
Impact on customer	NOT SYSTEMATIC	NOT SYSTEMATIC	NO	NOT SYSTEMATIC	YES	NOT SYSTEMATIC	NOT SYSTEMATIC

**Table 3. Structural parameters and contingent variables.**

	Environment (National/Regional HTA bodies)		Size of the unit (# of FTE)		Life-cycle		Mission (orientation-focus)		Professional Competencies	
	Relevant	Irrelevant	Essential	Big Sized	Mature	Early- Stage	Internal	External	Focused (e.g. medical based)	Broad (multiprofessional)
Authority/Centralization of power (leader)	NA	NA	High	Low	High	Low	High	Distributed	NA	NA
Formalization	High	Low	High	Low	High	Low	NA	NA	Low	High
Specialization	High	Low	Low	High	High	Low	Mid-Low	High	Low	High
Professionalization (training)	NA	NA	Low	High	High	Low	Mid-High	High	NA	NA
Integration	Integrated	Stand Alone	NA	NA	NA	NA	Low	High	High	Low

\* NA (not applicable) if the contingent variable is not affecting structural parameters.

**Figure 1. A contingency HB-HTA model**

		Level of integration	
		<i>High-Mid</i>	<i>Mid-Low</i>
Level of structuration	<i>Formal and specialized</i>	Integrated specialized HB-HTA function (e.g. Denmark, Finland)	Stand-alone HB-HTA function (Italy, Spain)
	<i>Informal and essential</i>	Integrated-essential HB-HTA function (Switzerland)	Independent group (New Zealand)