

WP8: Analysis of economic evaluation methods for hospital-based assessment

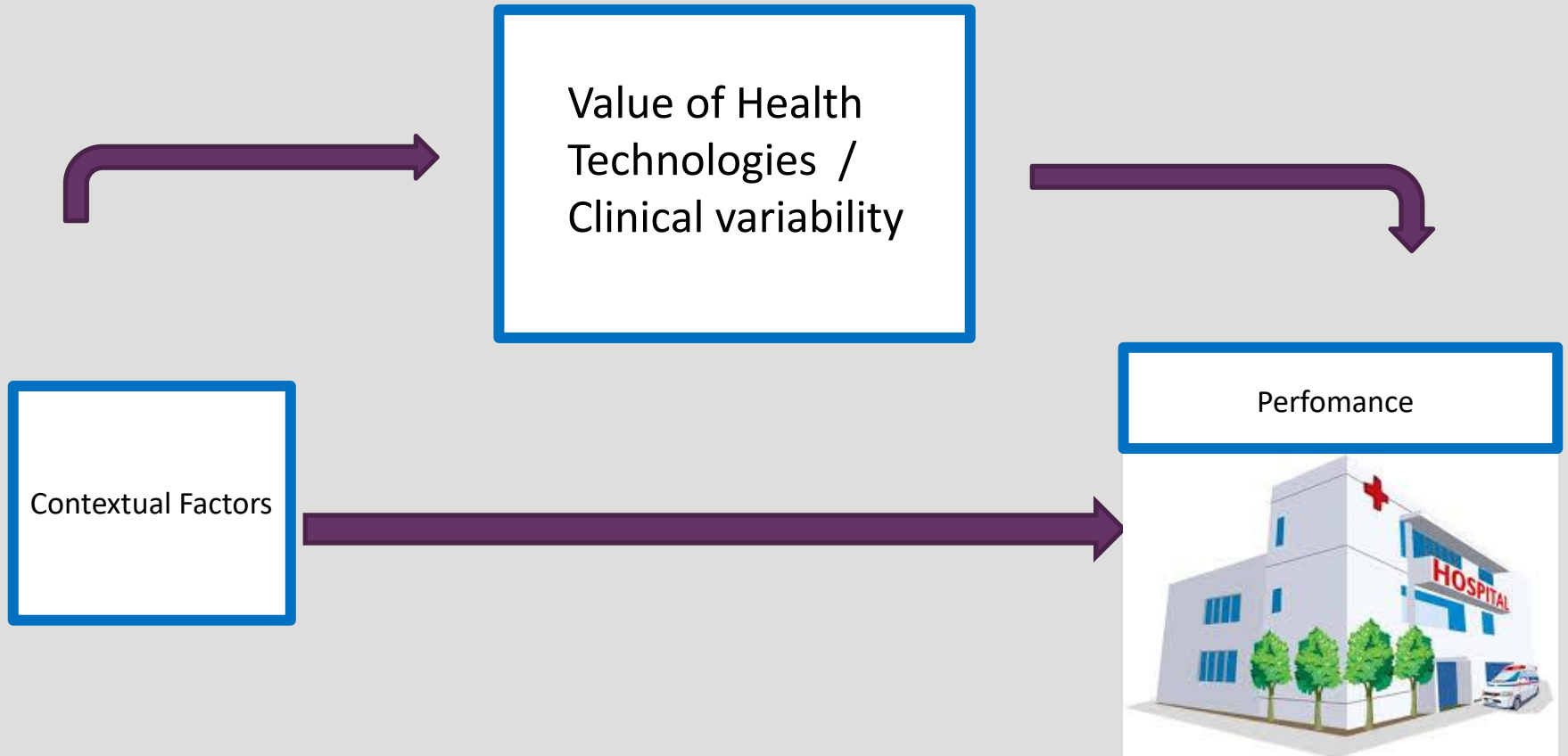
Americo Cicchetti & Irene Gabutti – Università Cattolica del Sacro Cuore
Marco Marchetti & Matteo Ruggeri – Istituto Superiore di Sanità

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Conceptual Framework



- Toolkit including a list of relevant indicators to capture hospital performance variability
- Toolkit to assess the transferability of evidence produced in other jurisdictions and decision-making levels
- Toolkit of instruments to identify the clinical variability and its impact on the use of health technology

Toolkit to capture hospital performance variability (TK1)

A guiding tool to assess hospital performance and to carry out benchmarking activities across them.

- **Core section:** Indicators generally measurable and assessable within most hospitals. Provides a “general assessment” of hospitals, independently from many of its characteristics (e.g. the clinical areas in which it operates). Dimensions that are controlled (either directly or indirectly) by top management.
- **Specific section:** Indicators specifically referred to hospitals’ main clinical departments. This allows *ad hoc* evaluations of departments as well as inter-organizational comparisons across the same departments.
- **Instructions:** For each indicator within the sections that are under analysis, a target must be defined by top management. At the end of the period assessed (e.g. the year), it should be indicated whether the target has been reached or not.
- **Main Dashboard:** Provides an integrated and easy-to-read assessment of the most “problematic” set of indicators and guides management towards setting the most urgent priorities both at the core vs. specific levels as well as stratifying by dimension of performance.

Toolkit to capture hospital performance variability (TK1)

IMPACT HTA

- Toolkit manual
- Core section Data-entry**
- Specific Section Data-entry
- Main dashboard
- Sources

Core Section

Clinical Effectiveness	Efficiency	Patient-centeredness
Safety	Staff orientation	Timeliness

PER-DIM	INDICATOR	TARGET VALUE	VALUE
	Average length of stay in hospital		0
Efficiency	Hospital bed coverage		0
Efficiency	Admission/discharge rate		0
Efficiency	Intensity of surgical theatre use		0
Efficiency	Surgery postponed or cancelled		0
Efficiency	Cost of a Standard Hospital Stay		0
Clinical Effectiveness	Hospital Deaths (HSMR)		1
Clinical Effectiveness	Hospital Deaths Following Major Surgery		0
Clinical Effectiveness	All Patients		

Specific Section

Breast Disease	Cardiology	Emergency
Gastrointestinal	Genitourinary Diseases	Hepato-biliary and Pancreatic Diseases
Lung Disease		

Outcome	Process	Volume
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AREA	PER-DIM	INDICATOR	TARGET VALUE	VALUE
Emergency	Process	Waiting times for emergency hospital care: proportion seen on time (Resuscitation - within 2 minutes)		1
Emergency	Process	Waiting times for emergency hospital care: proportion seen on time (Emergency - within 10 minutes)		0
Emergency	Process	Waiting times for emergency hospital care: proportion seen on time (Urgent - within 30 minutes)		0
Emergency	Process	Average time to head scan for patients with serious head injury		1
Emergency	Process	Average time to operation for complex leg fracture with skin damage		0
Emergency	Process	Percentage of patients at risk of severe haemorrhage who receive drugs to reduce bleeding		1
Emergency	Process	Percentage of significantly injured patients that have a rehabilitation prescription documented		0
Emergency	Outcome	Major trauma: 30 day survival		0
Cardiology	Volume	Myocardial infarction: volume of admissions		1
Cardiology	Volume	STEMI: volume of admissions		0
Cardiology	Volume	NSTEMI: volume of admissions		0
Cardiology	Volume	Volume of admissions with at least one PCI		1
Cardiology	Volume	Coronary artery bypass graft (CABG): volume of admissions		0
Cardiology	Volume	Valvuloplasty or heart valve replacement: volume of admissions		1
Cardiology	Process	Myocardial infarction: proportion of treated with PCI within 48 hours		0
Cardiology	Process	STEMI: proportion of treated with PCI within 48 hours from first hospital admission		0
Cardiology	Process	NSTEMI: proportion of treated with PCI within 72 hours from first hospital admission		1

Toolkit to capture hospital performance variability (TK1)

Choose the Domain of Performance

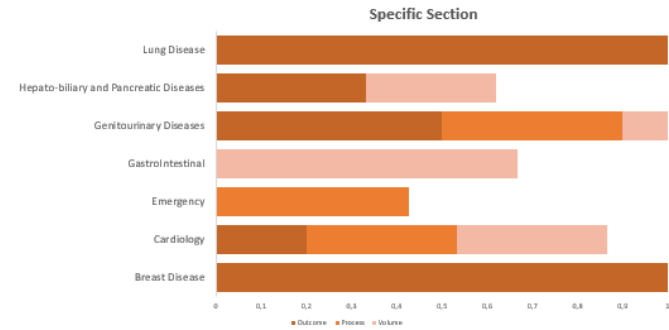
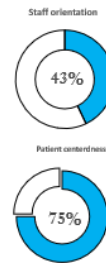
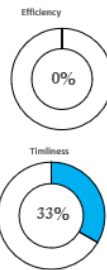
Core section: [] Specific section: []

Choose the Area of Service

Breast Disease, Cardiology, Emergency, Gastrointestinal, General, Genitourinary Diseases, Hepato-biliary and Pancreatic Diseases, Lung Disease

Choose Performance Indicator

Clinical effectiveness, Efficiency, Outcome, Patient-centeredness, Process, Safety, Staff orientation, Timeliness, Volume



Weight of the core sections

Clinical Effectiveness: 43%

Efficiency: 16%

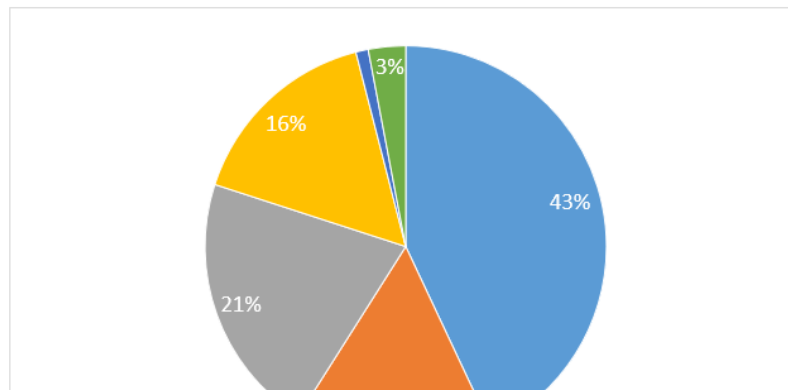
Patient-centeredness: 21%

Safety: 16%

Staff orientation: 1%

Timeliness: 3%

Check for the weights: 100%



Toolkit to assess the transferability of evidence produced in other decision-making levels (TK2)

A guiding tool to assess the overall adequacy of the organizational context in the implementation of a specific health technology.

- Type of technology
- Hospital infrastructure and architecture
- Hospital's availability of financial resources
- Leadership styles
- Human resource management tools

Toolkit to assess the transferability of evidence produced in other decision-making levels (TK2)

Assessment Toolkit

Introduction

Checklist

Dashboard

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Assess the transferability of evidence produced in other jurisdictions and decision-making levels

Objective of toolkit

A number of hospital contextual factors are able to affect the extent to which health technologies are capable of producing their effects on hospital performance. HTA is frequently carried out in other settings, such as in institutional bodies, research centres, other healthcare organizations, bringing hospitals to use its evidence without contextualizing it within its specific organizational boundaries. This toolkit provides guidance in systematizing those contextual variables that can affect the concrete implementation of health technologies and, in turn, their impact on hospital performance.

The toolkit is to be intended as an assessment of the overall adequacy of the organizational context in the implementation of a specific health technology. Therefore, this analysis should be repeated in all circumstances in which a costly technology must be assessed. The overall framework of the toolkit, though, can be further extended to general considerations on hospitals' readiness to implement technology use.

Toolkit to assess the transferability of evidence produced in other decision-making levels (TK2)

Assessment Toolkit Introduction Checklist Dashboard

Checklist

Assessment for:
Medical devices

Hospital infrastructure and architecture

University/ non-university

Being a university hospital can support training abilities and may be associated to a more dynamic and resilient organizational context, with positive effects on a broad range of technologies

Your choice:
 Barrier Partial Barrier Neutral Partial Enabler Enabler

Architectural type

Pavilion hospitals or hospitals with dispersed structures can hinder a smooth implementation of technologies, while modern uni- or multi-block hospitals may favour smooth implementation

Your choice:
 Barrier Partial Barrier Neutral Partial Enabler Enabler

Organizational chart

Rigid vertical units may favour implementation of highly specialised medical technology but, for technologies that require the involvement of multidisciplinary teams in different moments, it is likely that horizontal charts would help

Your choice:
 Barrier Partial Barrier Neutral Partial Enabler Enabler

Patient pooling approach

Progressive patient pooling approaches (based on intensity of care needs) may favour the use of shared technologies, due to their tendency of favouring multi-disciplinary teams

Your choice:
 Barrier Partial Barrier Neutral Partial Enabler Enabler

Assessment Toolkit Introduction Checklist

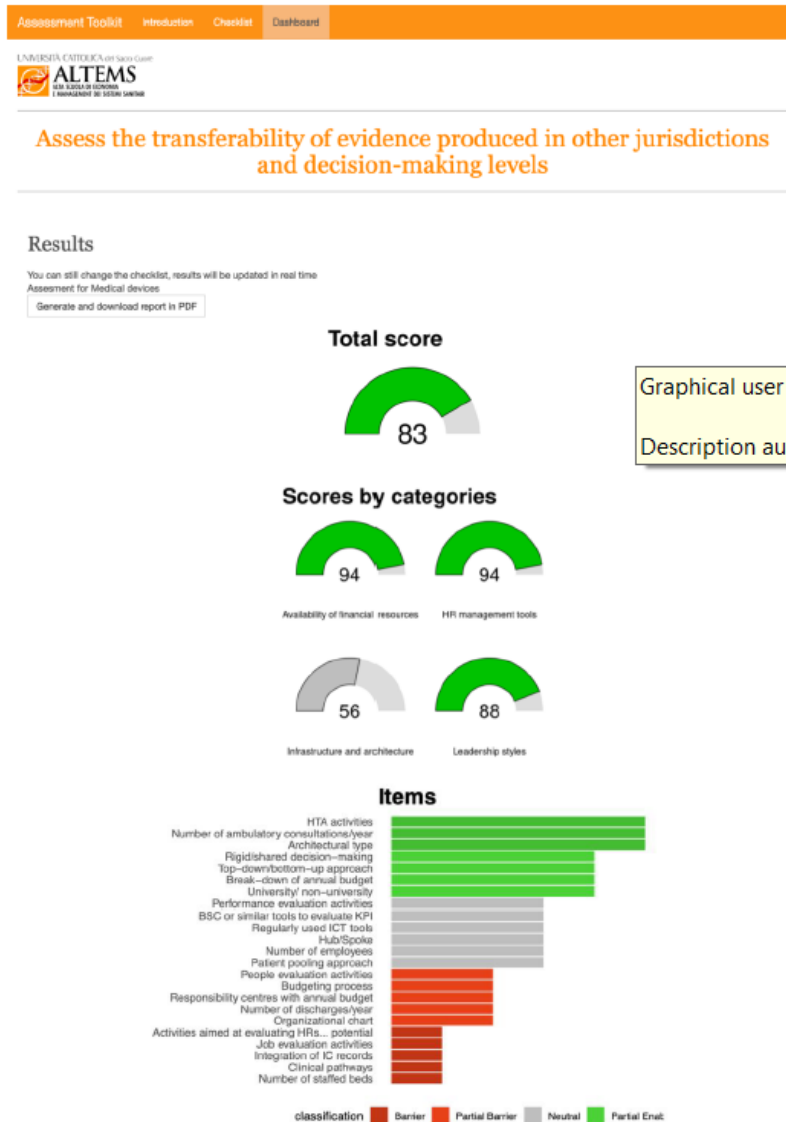
Checklist

Assessment for:
Medical devices

- Drugs
- Medical devices
- Electro-medical equipment
- Procedures

Graphical user interface
Description automatic

Toolkit to assess the transferability of evidence produced in other decision-making levels (TK2)



Graphical user interface
Description automatic

D 2.2 Outline of the model

- The model aims at assisting, supporting, advising and recommending political decisions in the field of medical devices by increasing the set of available information.
- The model takes into account the clinical variation and allows to formulate strategies to improve the efficiency applied to medical devices through a cost minimization analysis.
- Considering that the acquisition costs of medical technologies and devices represent a substantial part of the expenditure of the public health structures of the Italian National Health Service, this model becomes fundamental for identifying and optimize the use of technologies with the same efficacy and safety which lead to an increase of clinical variation.

Methods

- efficiency frontiers are estimated taking into account the minimum cost incurred in offering MD by the health structures included in the analysis.
- The expenditure items considered are: consumables (which include the various components of the prostheses and other consumables), staff, the operating room and other direct costs (including drugs).
- The model allows for the design of strategies aimed at pursuing an improvement in either economic and technical efficiency through the application of decrease coefficients, expressed as a percentage, on each cost item considered,
- particular reference to the different components of the prostheses.
- the case of hip replacement will be considered with particular reference to the difference between MoM, MoP, CoP and CoC.

Model structure

- The data used to test and validate the model come from four public health facilities in the Marche region: ASUR, AOU ANCONA and ASL MARCHE NORD.
- The model allows to place the healthcare facilities included with respect to an estimated efficiency frontier and the value of the DRG rate (which in the case of hip replacement is equal to € 8,837), following the implementation of a strategy aimed at increasing efficiency,
- The model consists of a deterministic and a probabilistic specification. The deterministic specification allows to observe the changes in terms of efficiency increase of a single divestment policy, while the probabilistic estimates the stochastic efficiency frontiers and allows to observe a complete map of all the possible combinations constituted by the various efficiency levels.

Some results (example 1)

OPTIMIZATION RESULTS

BACK TO SETTINGS

GO TO COSTO
ACCUMULATOR

RUN
SINGLE COMPONENT
OPTIMIZATION



	EFFICIENCY PROSTHESIS			DIFFERENCE FROM BEST PRACTICE			DIFFERENCE FROM BEST PRACTICE (%)		
	ASUR	AOU ANCONA	AO MARCHE NORD	ASUR	AOU ANCONA	AO MARCHE NORD	ASUR	AOU ANCONA	AO MARCHE NORD
MEAN	0,86	0,86	0,83	316,18 €	475,47 €	593,71 €	36%	41%	39%
MOM	0,90	0,88	0,80	207,11 €	459,15 €	710,78 €	13%	16%	44%
MOP	0,84	0,89	0,85	295,59 €	341,77 €	517,25 €	22%	13%	36%
COP	0,88	0,89	0,84	252,19 €	347,98 €	573,41 €	16%	14%	38%
COC	0,80	0,78	0,84	509,81 €	752,98 €	573,41 €	94%	121%	38%

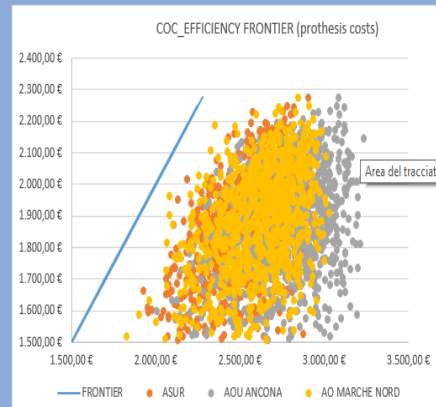
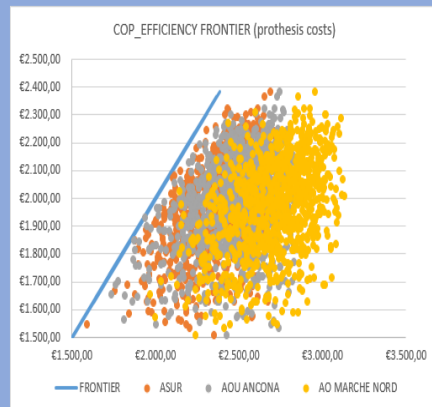
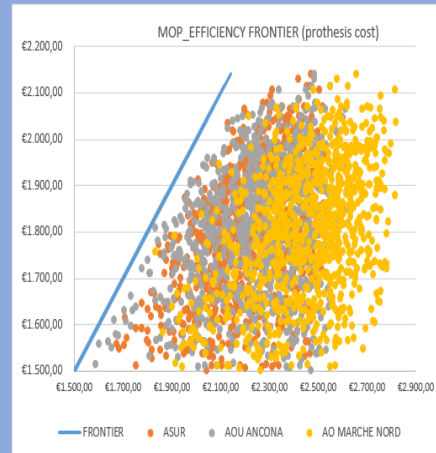
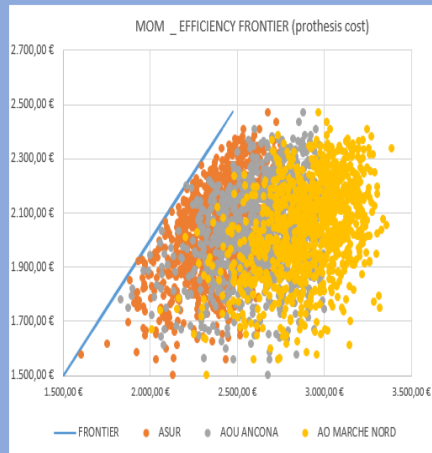
	EFFICIENCY PERSONNEL			DIFFERENCE FROM BEST PRACTICE			DIFFERENCE FROM BEST PRACTICE (%)		
	ASUR	AOU ANCONA	AO MARCHE NORD	ASUR	AOU ANCONA	AO MARCHE NORD	ASUR	AOU ANCONA	AO MARCHE NORD
Personnel costs (€)	0,77	0,65	1,00	488,08 €	891,69 €	- €	29%	53%	-
LENGHT OF STAY (DAYS)	0,77	0,65	1,00	2,81 €	5,13 €	-	29%	53%	-
COST/DAY	1,00	1,00	1,00	- €	- €	0,00	0%	0%	0%

	EFFICIENCY OPERATING THEATRE			DIFFERENCE FROM BEST PRACTICE			DIFFERENCE FROM BEST PRACTICE (%)		
	ASUR	AOU ANCONA	AO MARCHE NORD	ASUR	AOU ANCONA	AO MARCHE NORD	ASUR	AOU ANCONA	AO MARCHE NORD
Operating theatre costs (€)	0,90	0,90	1	72,56 €	70,56 €	- €	11%	11%	0%
Operating theatre usage (minutes)	1,00	1,00	1	- €	- €	- €	0%	0%	0%
COST/MINUTE	0,90	0,90	1	0,54 €	0,54 €	- €	11%	11%	0%

OPTIMIZED ACCUMULATOR						
TYPE	personnel	materials	op. theatre	other dir costs	total	DRG margin
MOM		2.802,87 €			5.540,80 €	3.296,20 €
MOP	1.673,88 €	2.623,81 €	653,06 €	410,98 €	3.687,86 €	5.149,14 €
COP		2.723,16 €			5.461,08 €	3.375,92 €
COC		2.583,06 €			5.320,98 €	3.516,02 €

OPT COST MOM	2.097,92 €
OPT COST MOP	1.840,78 €
OPT COST COP	2.048,47 €
OPT COST COC	1.949,13 €

Some results (3)



BACK TO
PROBABILISTIC
SETTINGS





- Americo Cicchetti (Co-PI)
- Marco Marchetti (Co-PI)
- Irene Gabutti (Coordinator)
- Signe Daugbjerg (Researcher)
- Matteo Ruggeri (Researcher)

americo.cicchetti@unicatt.it
marco.marchetti@iss.it

