AAL FORUM 2016
26-28 SEPT ST. GALLEN, SWITZERLAND
AAL PROGRAMME

# Hospital costing evalution driven by a new robotic solution for patients affected by dementia.

# What is going on in "Casa Sollievo della Sofferenza"

**Pasquale Chiarelli**

*UOC Pianificazione e Controllo di Gestione*
*IRCCS Casa Sollievo della Sofferenza*
*San Giovanni Rotondo (Puglia- Italy)*

# IRCCS CASA SOLLIEVO DELLA SOFFERENZA: ATTIVITA' 2015

Posti Letto
**887**

Personale occupato
**2.624**

Personale dedicato
alla **ricerca scientifica**
**129**

| **CASI** | **61.788** |
|---|---|
| Ricoveri ordinari | 37.481 |
| Ricoveri in riabilitazione | 559 |
| Ricoveri diurni (DH/DS, 0-1 day) | 13.664 |
| PAC | 10.084 |

**Attività Ambulatoriale**:

oltre **1.200.000** prestazioni

# M.A.R.I.O.

## KOMPAI PLATFORM

### from Robosoft

**Robot semantics** based on Semantic Web practices and technologies: Linked Data principles, RDF, SPARQL, RIF.

**Semantic Web-based machine reading/listening in robots.** FRED, will be extended and improved for dealing with context-based grounding and interpretation of natural language input.

**"Entity-centric" knowledge management:** each entity and its relations have a public identity that provides a first "grounding" to the knowledge used by robots. Such identity is given by resolvable URIs that use simple Web and Internet protocols to provide useful knowledge as a representative of real world entities.

**Mario Ontology Network (MON)** will reuse and extend the Ontologies for Robotics and Automation. MON will evolve over time by integrating ontologies emerging from interaction with assisted humans, sensors or with other robots.

**Ability to advance robot knowledge by** learning new ontology patterns from its experience with users and the robot network in place. New emerging patterns and expressions are fed back to the robot's cognitive system in order to address emotional needs of end users in compliance with the social and behavioral objectives of MARIO

**Robot social skills:** a sentiment analysis framework based on deep parsing of natural language and supported by MON will deal with moods and expression recognition providing robots.

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# Investigating the effectiveness of technologies applied to assist seniors: A systematic literature review

Pouria Khosravi[a], Amir Hossein Ghapanchi[a,b,*]

[a] School of Information and Communication Technology, Griffith University, Gold Coast, Queensland 4222, Australia
[b] Institute for Integrated and Intelligent Systems, Gold Coast, Queensland 4222, Australia

## Implications for practice

The findings of this study provide a number of implications for practice by showing the benefits of assistive technologies. First, policy-makers and governments should financially support newtechnologies and increase ICT literacy among seniors. Therefore, governments should recognise and promote the use of new tech-nologies and the positive impact of these technologies on society, healthcare and the quality of life among seniors. This is because the use of assistive technologies not only elevates the quality ofthe senior individual's life but also has a positive impact on the healthcare system by reducing costs, readmissions and the length of stay in hospital.

# COSTS: HOW TO MEASURE RESOURCES

But how ?

**1. EXPENDITURE**

**2. REIMBURSEMENT**

**3. STANDARD COSTS**

# Unfortunately expenditures and costs are always confused:

## This is not true

**EXPENDITURE**: each product value x number of product

**COST:** a measure of how the product is used

**STANDARD COST**: how the products are/will be used to make acivities or clinical procedures (Are my cost lower or higher as compared to a standard)

# DEFINITION OF STANDARD COST

## STANDARD COST

SINGLE MEDICAL PROCEDURE COST COMPUTED FROM A SAMPLE OF HOSPITAL WITH A SIMILAR PRODUCTIVE ACTIVITY

CLEAR METHOD
(Activity Based Costing)

AGGREGATION OF A SIGNIFICANT HOSPITAL SAMPLE

# Why we use standard cost computation

***To adress to three main questions***

1. *Who make something and by which resources (time and money)*
2. *How any does activity cost?*
3. *Establish Bench*

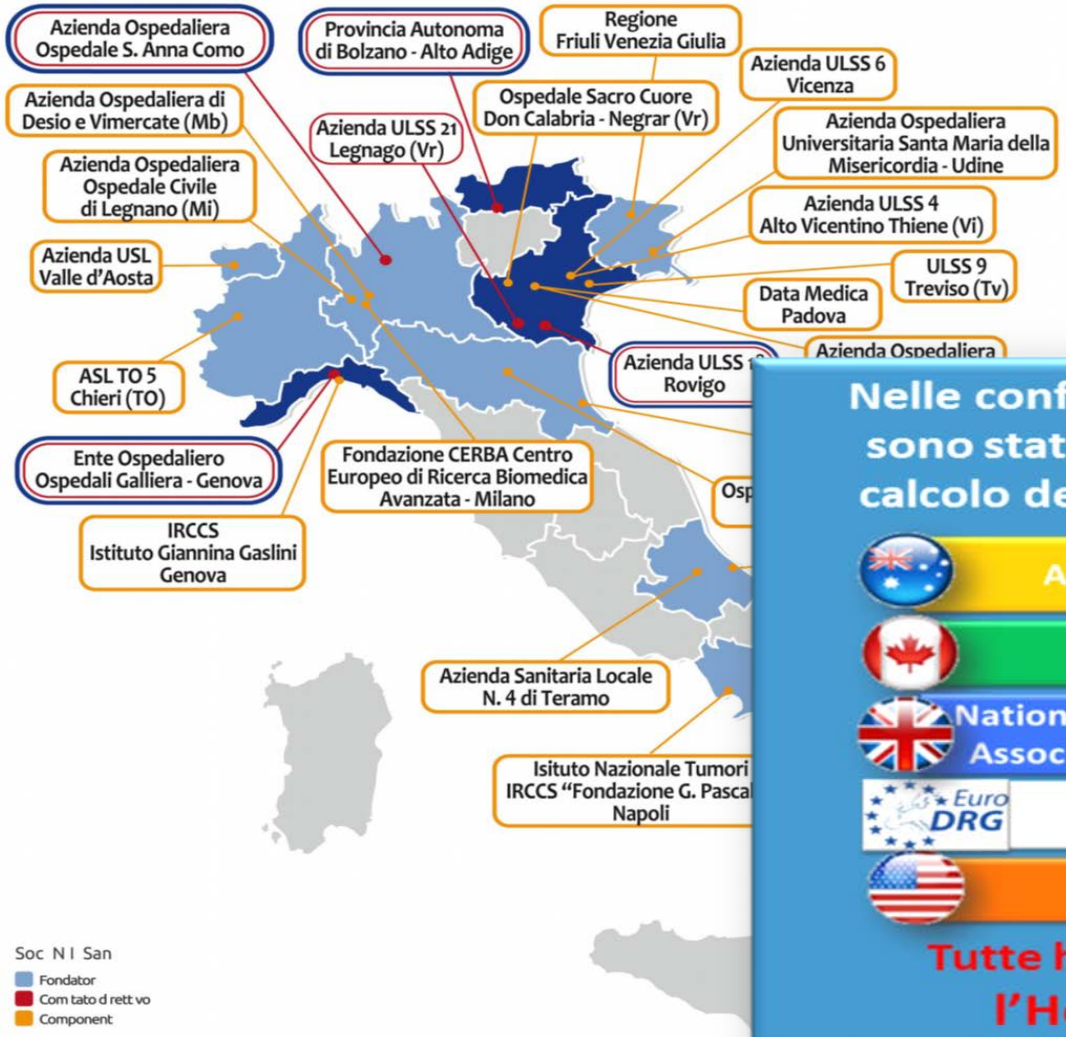
***Come ?***

1. *Organizzative analisys*
2. *Compute our costs*
3. *What must be changed when we are compared to the benchmark*

**No**

**Self referential**

# An network was created N.I.San. - Network Italiano Sanità




**Nelle conferenze di Brisbane e Montréal del 2011 sono stati stabiliti i requisiti internazionali per il calcolo dei costi standard in Sanità, derivanti da:**

- Australian Hospital Patient Costing Standards
- Canadian Institute for Health Information
- National Health Service e Health Financial Management Association ("Acute Health Clinical Costing Standards")
- EuroDRG project
- Health Economics Resource Center

**Tutte hanno in comune lo stesso metodo:**
**l'Hospital Patient Costing (HPC)**

*www.costistandard.com*

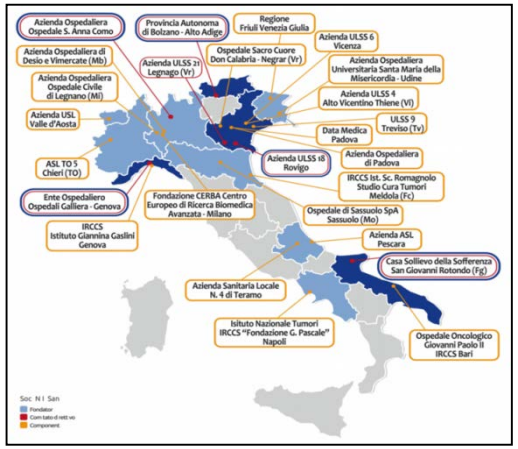
# Processo di determinazione dei costi standard del N.I.San.

***HABC Hospital Activity Based Costing***

This scientific approach allows computing the **cost** for a single hospitalization event **split for each productive factors** (medical staff, nursing staff, drugs, common costs, etc.) and **for areas** (surgical theatre, ward, ICU,)

Improve the **correct allocation** of resources

**N.I.San**.: the Italian Health Network of 21 hospitals that share costs using HABC method to determinate ***STANDARD COST***.



# Processo di determinazione dei costi standard del N.I.San.

***HABC Hospital Activity Based Costing***

1. Identification of the "clinical **activity centers**" (operating rooms, clinical ward, intensive care unit, services as Radiology-laboratory-pathology-transfusional lab and A&E, other services, etc.).

2. The HABC method uses the Kaplan West Matrix to correctly allocate costs to each clinical activity center . **Time** is the **cost driver (cost driver** = weighting factor) used for Human resource.

3. Once attributed costs we obtain, for each SINGLE HOSPITALIZATION EPISODE, the **final matrix** that contains the **full cost divided for the type of activity** (operating rooms, clinical ward, ICU, other services, etc.) and for productive factors (medical staff, nursing staff, drugs, etc.).

# ANALISI ORGANIZZATIVA

| Codice | Denominazione | Tipologia costo |
|---|---|---|
| 25 | Chirurgia Addominale | Personale medico |

**2013**

**Importo diretto** 1.499.505,10

**Importo totale** 1.499.505,10

| Centro di attività | Driver ore di lavoro | | Ore per attività | % su totale | Costi per attività |
|---|---|---|---|---|---|
| | Tipologia | Importo | | | |
| Day Hospital (solo degenza) | Ore settimanali | 7,00 | 364 | 1,7 | 26.216 |
| | N° medio operatori | 1,00 | | | |
| Terapia intensiva | Ore settimanali | | 0 | 0,0 | 0 |
| Sala operatoria | Ore sett. day surgery/PAC | 5,00 | 11.336 | 54,4 | 816.455 |
| | Ore sett. Ricoveri ordinari | 104,00 | | | |
| | N° medio operatori sala op. | 2,00 | | | |
| PIAC | Ore sett. (solo per cardiologie) | | 0 | 0,0 | 0 |
| Guardia interdivisionale | Ore settimanali | 50,00 | 2.600 | 12,5 | 187.260 |
| Attività per degenti in altri reparti | Tempo medio (ore) per prest. | 0,40 | 582 | 2,8 | 41.946 |
| | N° prestazioni | 28,00 | | | |
| Attività per il Pronto Soccorso | Tempo medio (ore) per prest. | 0,33 | 573 | 2,8 | 41.280 |
| | N° prestazioni | 33,00 | | | |
| | Ore settimanali guardia* | | | | |
| Attività ambulatoriale per esterni | Tempo medio (ore) per prest. | 0,2 | 1.196 | 5,7 | 86.140 |
| | N° prestazioni | 115,00 | | | |
| Emergenza/118 | Ore settimanali | | 0 | 0,0 | 0 |
| Ricerca | Ore settimanali | 1,00 | 52 | 0,2 | 3.745 |
| "Territorio" | Ore settimanali | | 0 | 0,0 | 0 |
| Altre attività (specificare): | Ore settimanali | | 0 | 0,0 | 0 |
| Attività per la degenza nel proprio reparto | Differenza tra le ore di attività e le ore per le altre attività | | 4.116 | 19,8 | 296.462 |
| | | TOTALI | 20.820 | 0,0 | 1.499.505 |

Settimane di riferimento 52 N° operatori 10 Costo orario

# ACIVITY BASED COSTING – A.B.C.

**Kaplan West matrix**

1. Interviews to health care team
2. Each Clinical Dept.
3. Specific role/produtive factor:
   - Physicians
   - Registered Nurses
   - Etc.

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| | | TOTALI | 20.820 | 0,0 | 1.499.505 |

| Settimane di riferimento | 52 | N° operatori | 10,75 | Costo orario | |
|---|---|---|---|---|---|

# ORGANIZZATIVE ANALISYS

- Medici;
- Medici non dipendenti;
- Dirigenti Sanitari non Medici (Biologi, Chimici, Farmacisti);
- Dirigenti Sanitari non Medici non dipendenti;
- Ostetriche;
- Tecnico;
- Tecnici non dipendenti;
- Infermiere Generico;
- Infermiere Professionale;
- Infermiere Professionale non dipendente;
- Religiosi;
- Religiosi non dipendenti;
- Amministrativi;
- Amministrativi non dipendenti;
- Ausiliario/OTA – OSS.

**Time** (hours) dedicated to each activity **"driver of activity"**

**Time** the most important driver to catch the productive factor determinated by **the personnel**

# M.A.R.I.O. ?

## KOMPAI PLATFORM

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# STANDARD COSTS IN OUR HOSPITAL
# AS A CHANGE MANAGEMENT TOOL

M.A.R.I.O is an important change in the hospital setting.

The use of robot to help the clinical team to cope with the patients affected by dementia implies a save in time for this productive factor.

But how can we use this saved time ?

- Production increase;
- **Research**;
- Release time to the patients's care

# STANDARD COSTS IN OUR HOSPITAL AS A CHANGE MANAGEMENT TOOL

Time save means also **costs savings:**

For instance:

- Administery drug mistakes;
- More time to dedicate to patients and their relatives
- Clinical mistake prevention
- etc

Risk management strategy → Insurance rates

Thank you for your attention…

…sorry for some italian words.

p.chiarelli@operapadrepio.it

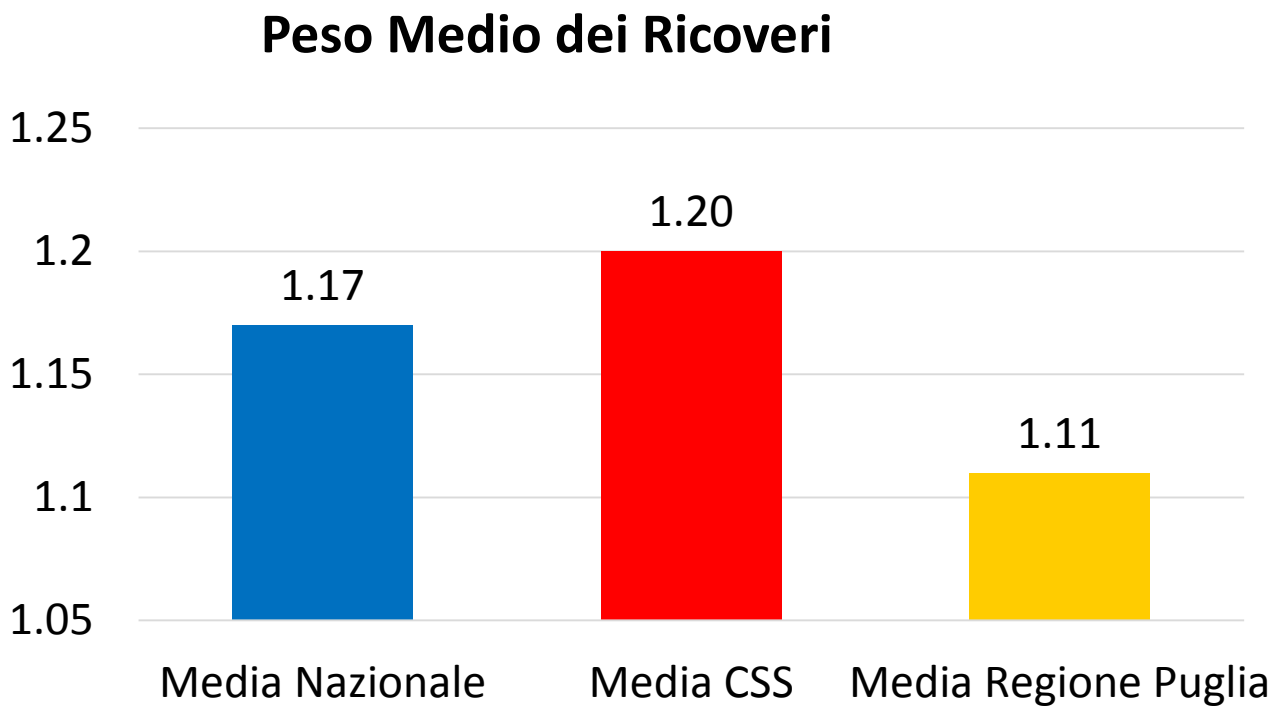
# IRCCS CASA SOLLIEVO DELLA SOFFERENZA: ATTIVITA' 2015

## 10 DIPARTIMENTI: 42 UU.OO.

| | |
|---|---|
| EMERGENZA, ACCETTAZIONE E AREA CRITICA | **1** |
| CARDIOLOGICO - VASCOLARE | **4** |
| DIAGNOSTICA DI LABORATORIO E TRASFUSIONALE | **3** |
| ETÀ EVOLUTIVA | **5** |
| ONCO-EMATOLOGICO | **6** |
| SCIENZE CHIRURGICHE | **6** |
| SCIENZE MEDICHE | **9** |
| SCIENZE RADIOLOGICHE | **4** |
| TESTA-COLLO | **4** |

RISORSE UMANE

# IRCCS CASA SOLLIEVO DELLA SOFFERENZA: ATTIVITA' 2015



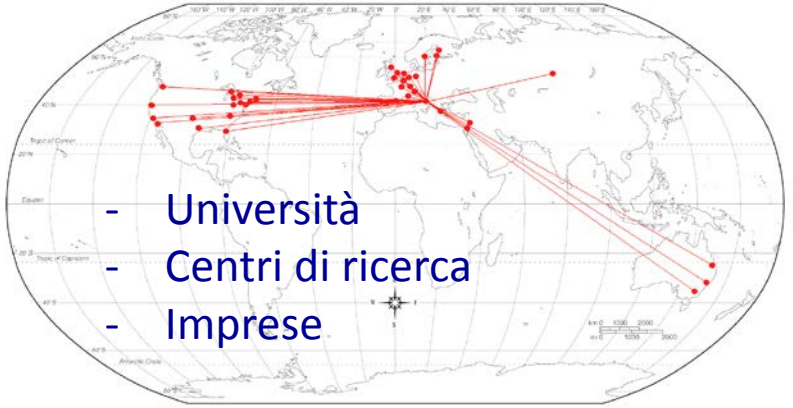

**Fonte:** Ministero della Salute, Rapporto annuale sull'attività di ricovero ospedaliero*, Dati SDO* ***primo semestre 2015***, pubblicato Novembre 2015

# ATTIVITA' DI RICERCA SCIENTIFICA

Disciplina di Riconoscimento Ministeriale:
**MALATTIE GENETICHE, TERAPIE INNOVATIVE E MEDICINA RIGENERATIVA**

**Dal 2011 più di 73 pubblicazioni con Impact Factor > 10**

## Partnership internazionali



- Università
- Centri di ricerca
- Imprese

## Tasso di Eccellenza

### Qualità della Ricerca Scientifica in base alle pubblicazioni

| Posizione Enti di Ricerca italiani | Posizione IRCCS | Istituto | Sede |
|---|---|---|---|
| 5 | 1 | Istituto Europeo di Oncologia | Milano |
| 6 | 2 | Fondazione IRCCS Istituto Nazionale Tumori di Milano | Milano |
| 7 | 3 | Istituto Dermopatico Dell'Immacolata IRCCS | Roma |
| 8 | 4 | Istituto Clinico Humanitas | Rozzano (MI) |
| 11 | 5 | Fondazione IRCCS San Raffaele del Monte Tabor | Milano |
| 12 | 6 | Istituto Auxologico Italiano IRCCS | Milano |
| **15** | **7** | **Ospedale Casa Sollievo della Sofferenza IRCCS** | **San Giovanni Rotondo (FG)** |
| 16 | 8 | Istituto Nazionale per la Ricerca sul Cancro IRCCS | Genova |