

la statistica per valutare e programmare a livello locale

novembre 2016/  
febbraio 2017

# Numeri per decidere

Incontri con  
Dipartimento di Scienze statistiche dell'Università di Bologna

12 dicembre 2016 Regione Emilia-Romagna

15.30-18.00

Indicatori, valutazione delle performance, sistemi sanitari e big data: può la statistica influenzare (e migliorare) le politiche sociali?

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School of Health Sciences, University of Surrey

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# Argomenti

1. Perché valutare la Performance dei sistemi sanitari?
2. Perché c'è bisogno delle Scienze Statistiche?
3. Che sfide si aprono con i "Big Data"?
4. Quale futuro per le Statistiche della Salute?

# Argomenti

- 1. Perché valutare la Performance dei sistemi sanitari?**
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# Spreco in sanità

## DECREASE WASTE AND INCREASE EFFICIENCY

Money should not be spent on unnecessary administration, inefficiencies, and care that doesn't improve health.

### IN HEALTH CARE...

1/3



of health care expenditures—an estimated \$750 billion!—don't improve health.

### IN OTHER INDUSTRIES...



#### FACTORY ASSEMBLY LINES

are continually monitored to improve quality, identify inefficiencies, and remove waste.

IOM (Institute of Medicine). 2012. Best care at lower cost: The path to continuously learning health care in America.

# Know-do gap

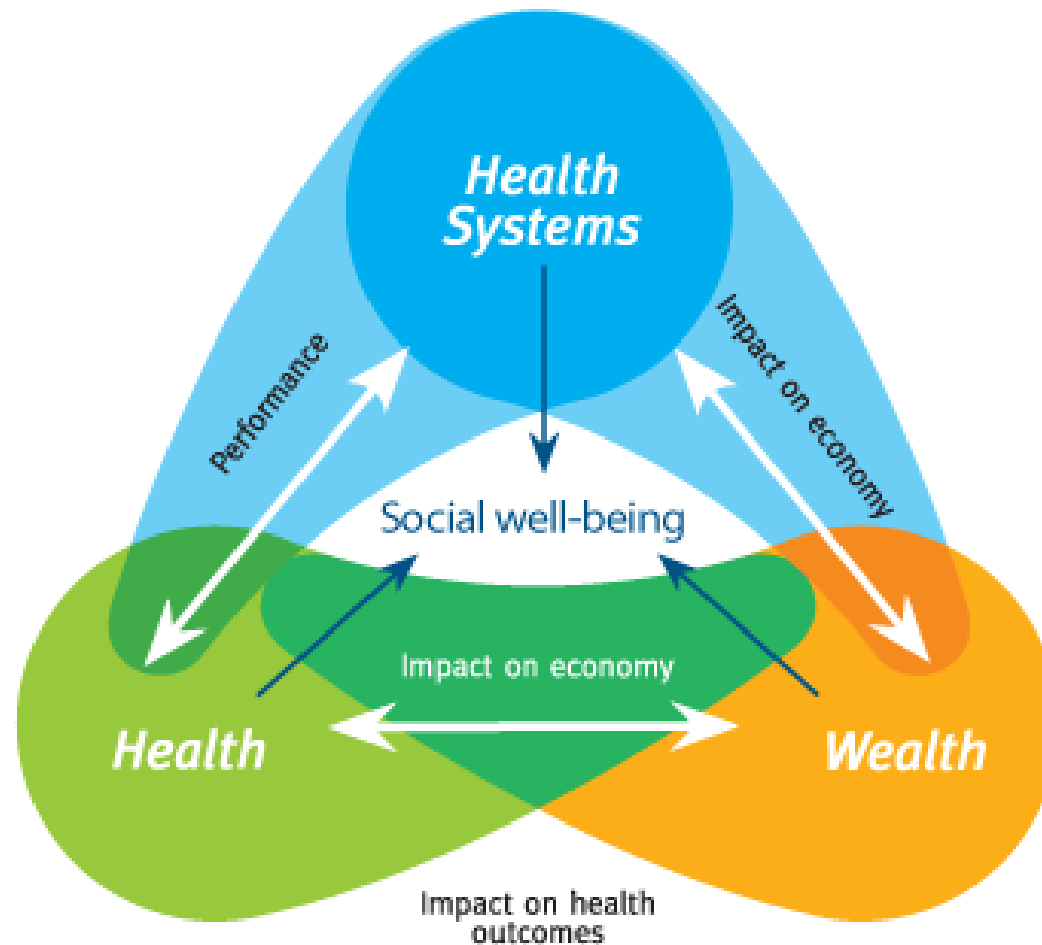
**Quello che si fa**

**Quello che si sa**



# WHO European Ministerial Conference on Health Systems

Tallinn, Estonia 25-27 June 2008



# Messaggi chiave della Charter

Un sistema sanitario va ben oltre i sistemi di cura.

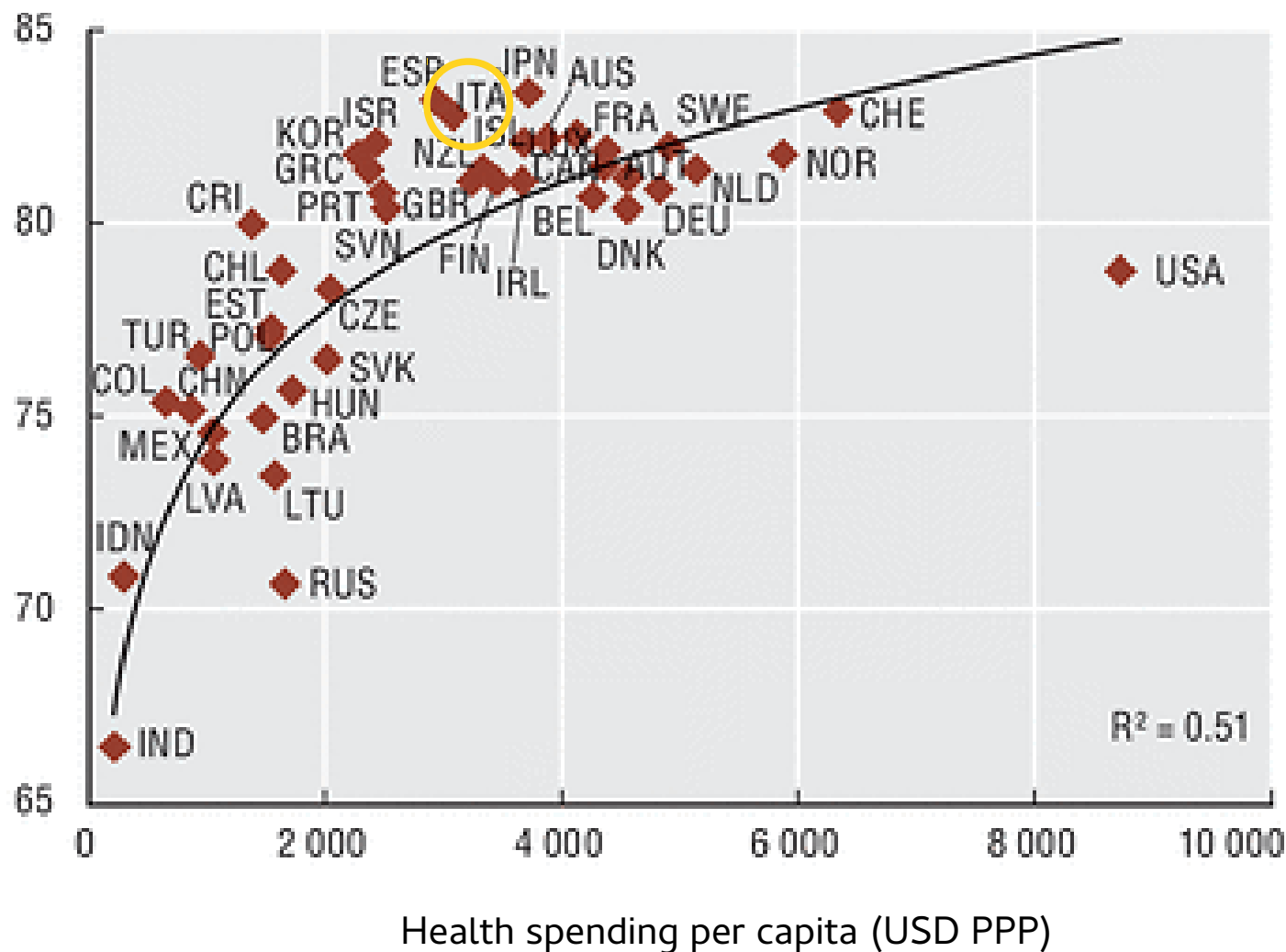
Sistemi sanitari efficaci promuovono contemporaneamente salute e benessere economico: ***oltre i sistemi di cura: sistemi sanitari per la salute ed il benessere economico***

Investire nella salute vuol dire investire nello sviluppo umano futuro: ***investire nella salute, investire nel futuro***

Sistemi sanitari ben funzionanti sono essenziali per ogni società che intenda migliorare e raggiungere l'equità nella salute: ***sistemi sanitari rafforzati salvano più vite***

# Relazione tra spesa e salute – Anno 2013

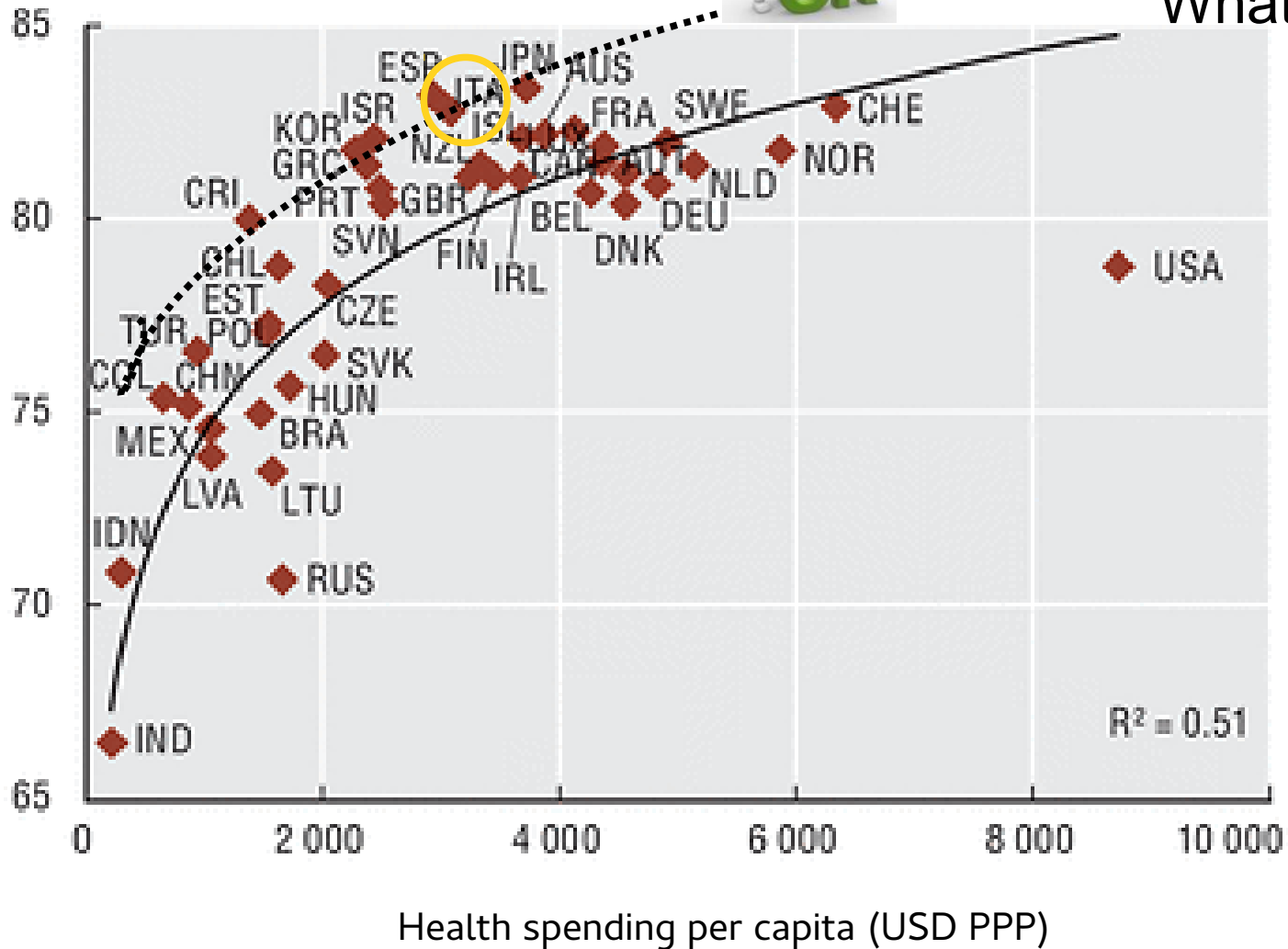
Life  
Expectancy  
in years





# Relazione tra spesa e salute – Anno 2013

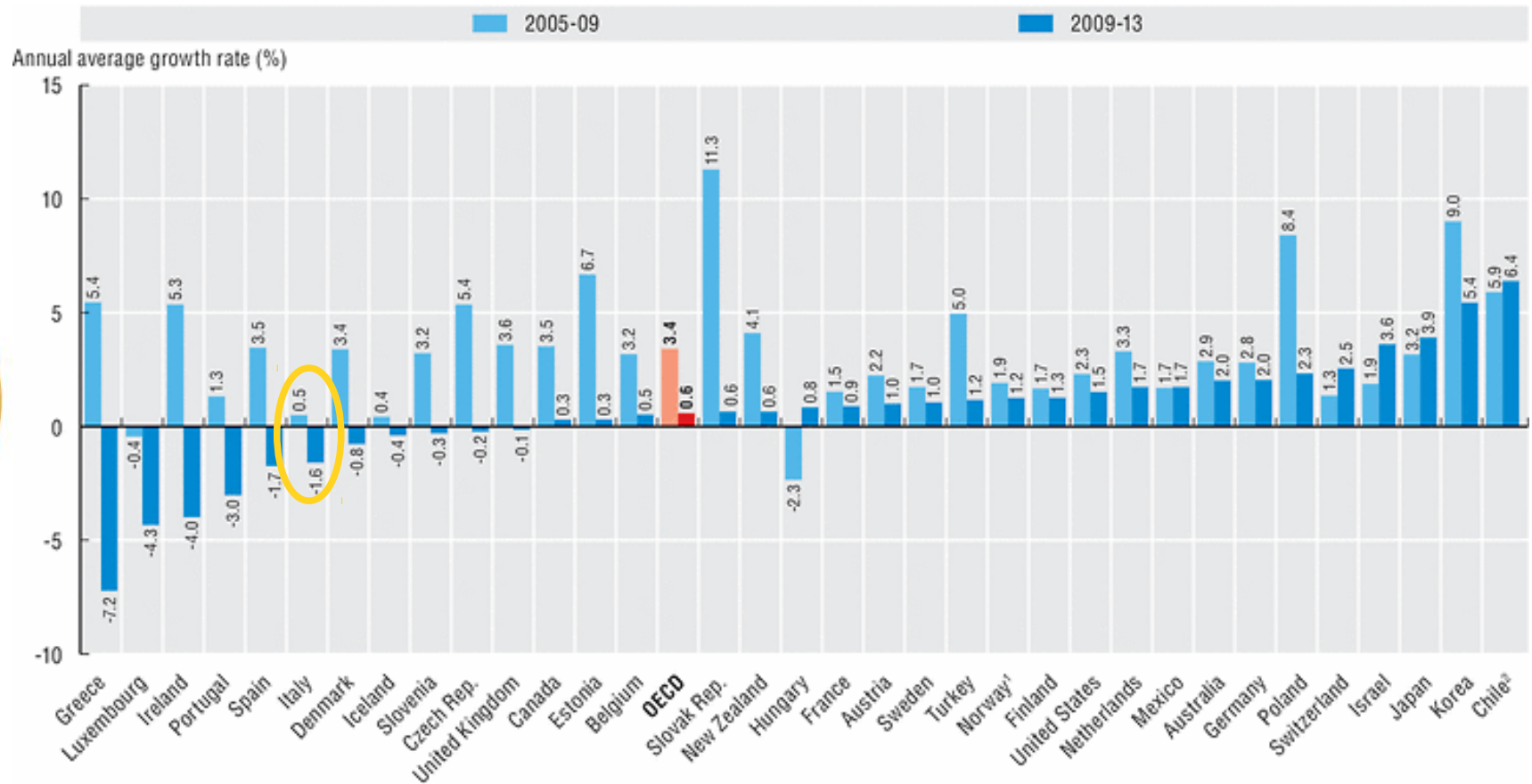
Life Expectancy in years



What if...?

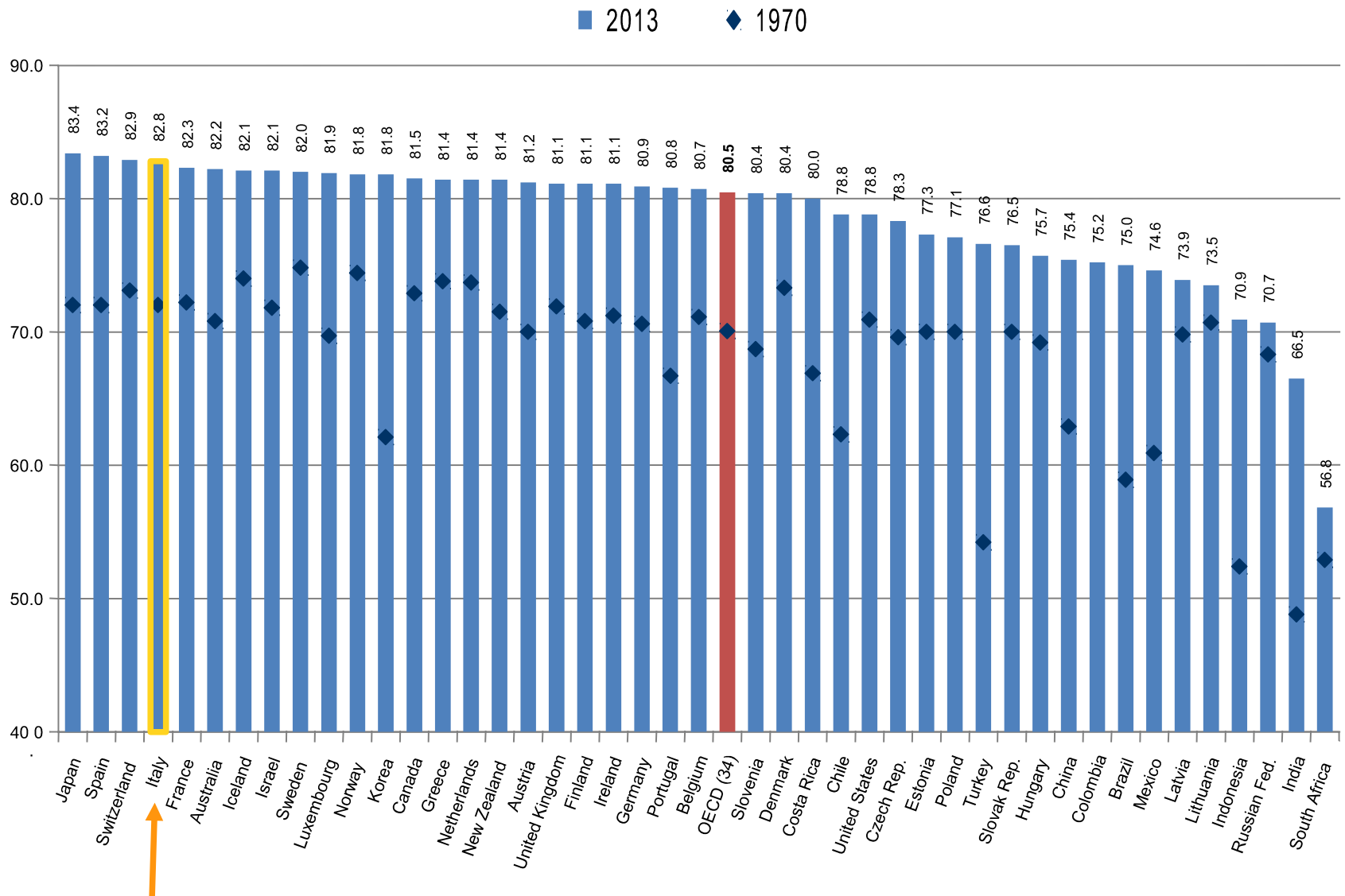
# Annual average growth rate in per capita health expenditure 2005-2013

Source: OECD Health at a Glance 2015



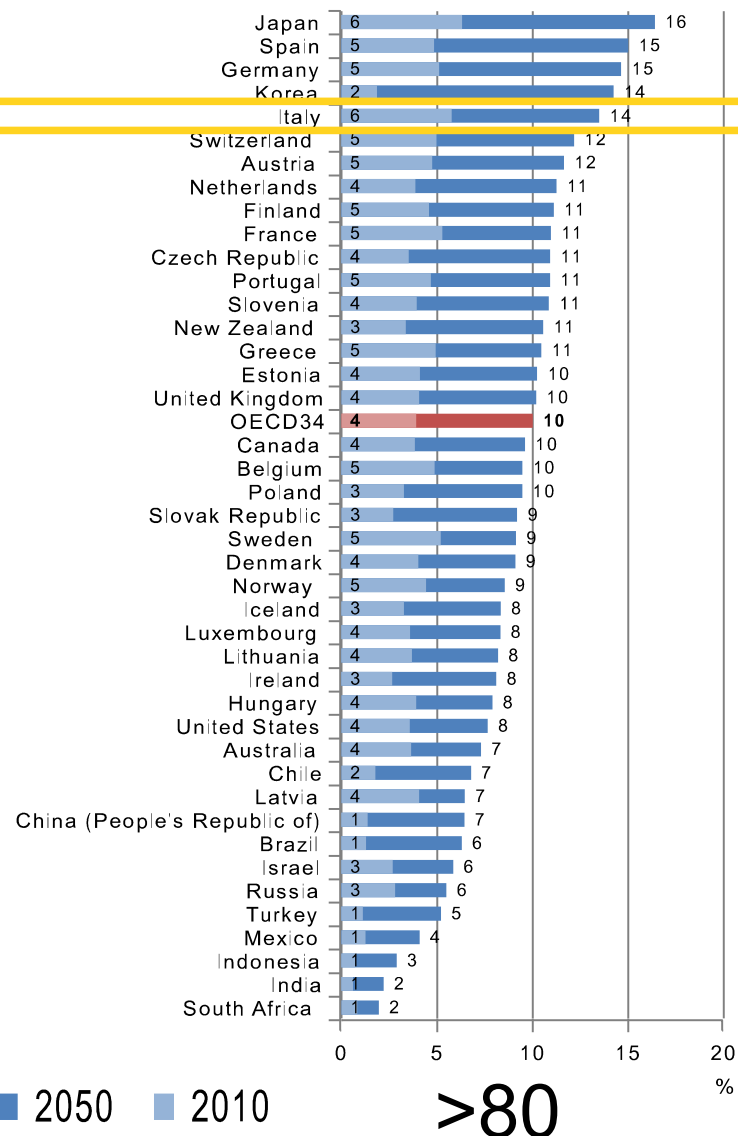
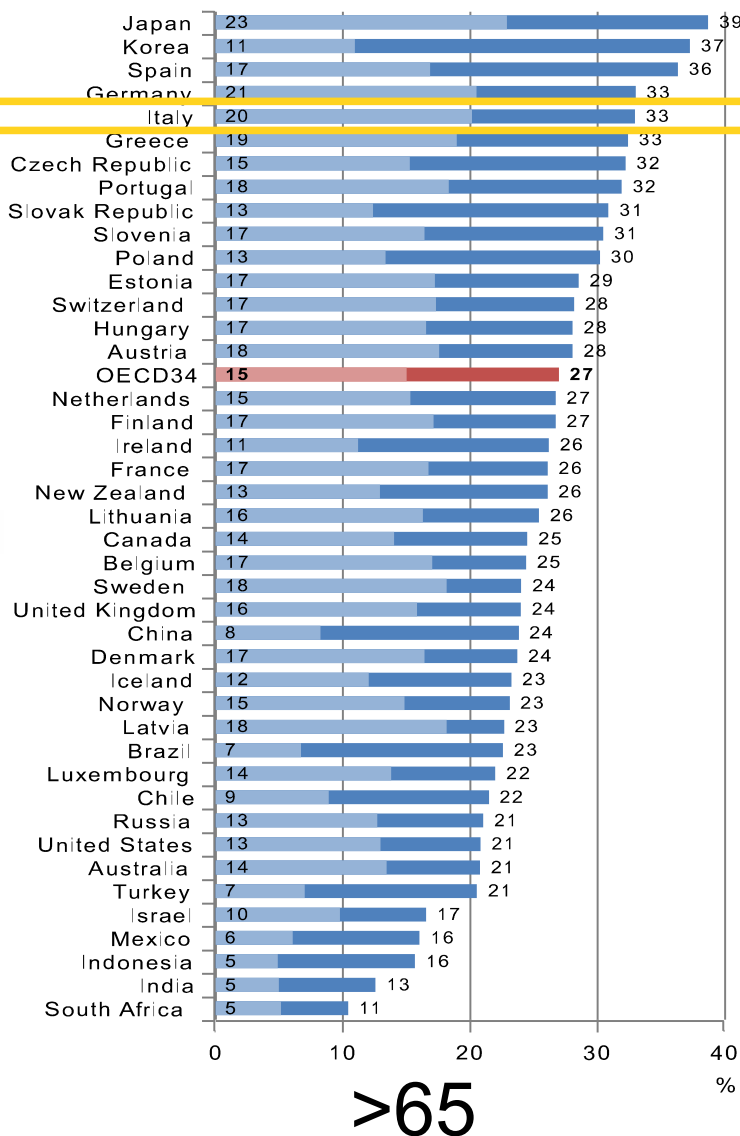
# Life expectancy at birth, 1970 and 2013 (or nearest years)

Source: OECD Health at a Glance 2015



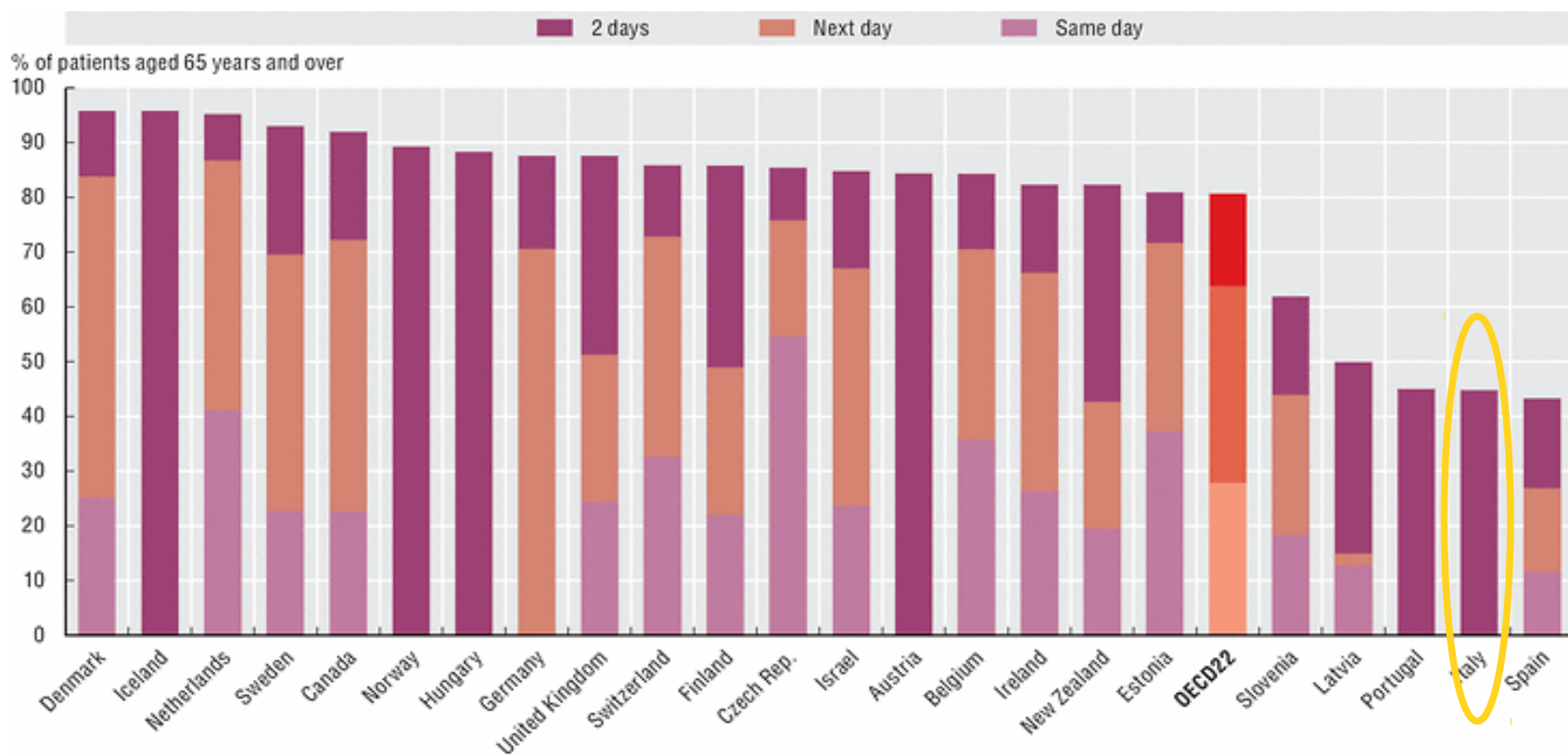
# Share of the population aged over 65 and 80 years, 2010 and 2050

Source: OECD Health at a Glance 2015



# Hip fracture surgery initiation after admission to hospital, 2013

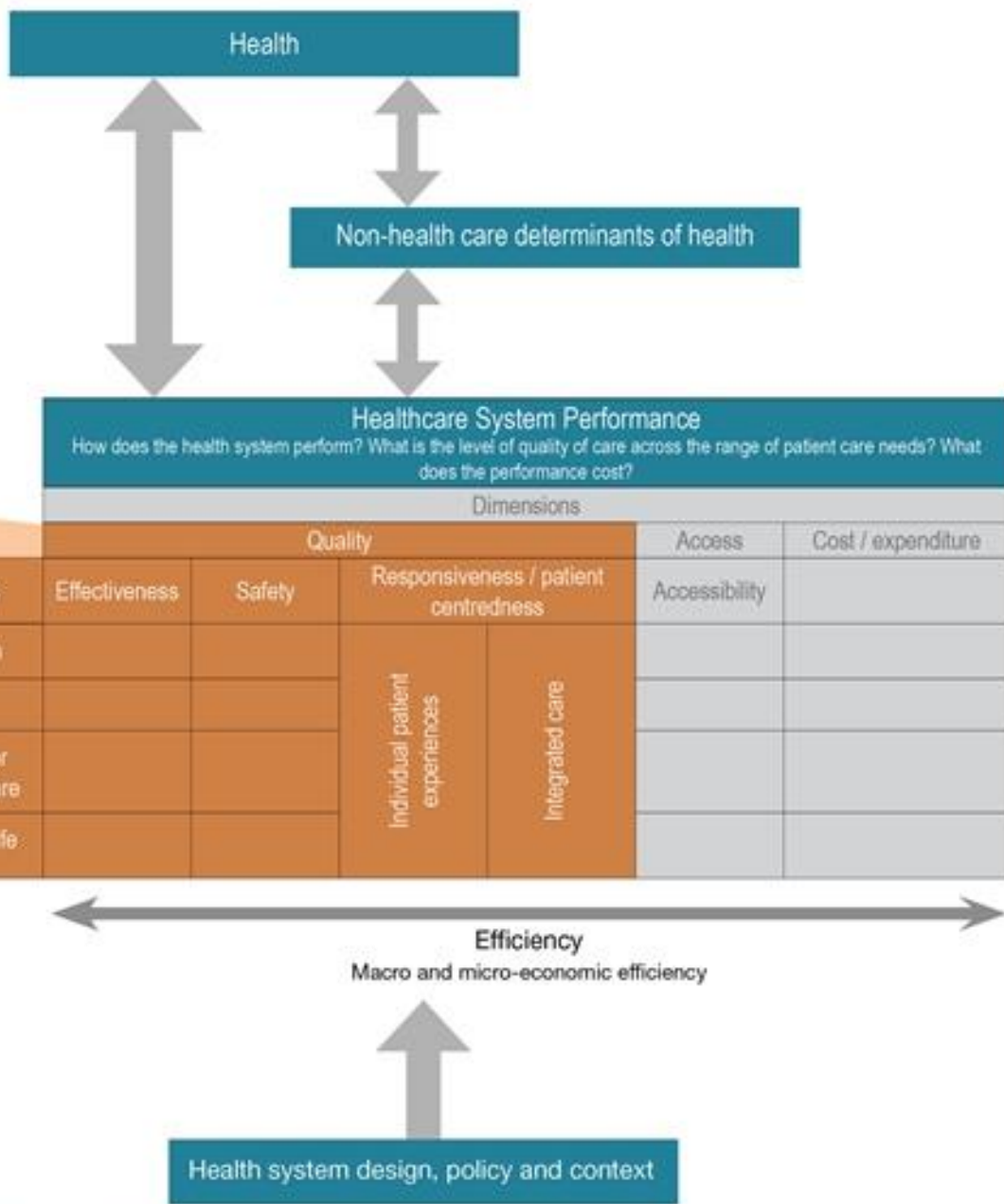
Source: OECD Health at a Glance 2015



# OECD Framework for Health System Performance Measurement



Current focus of HCQI project



Article

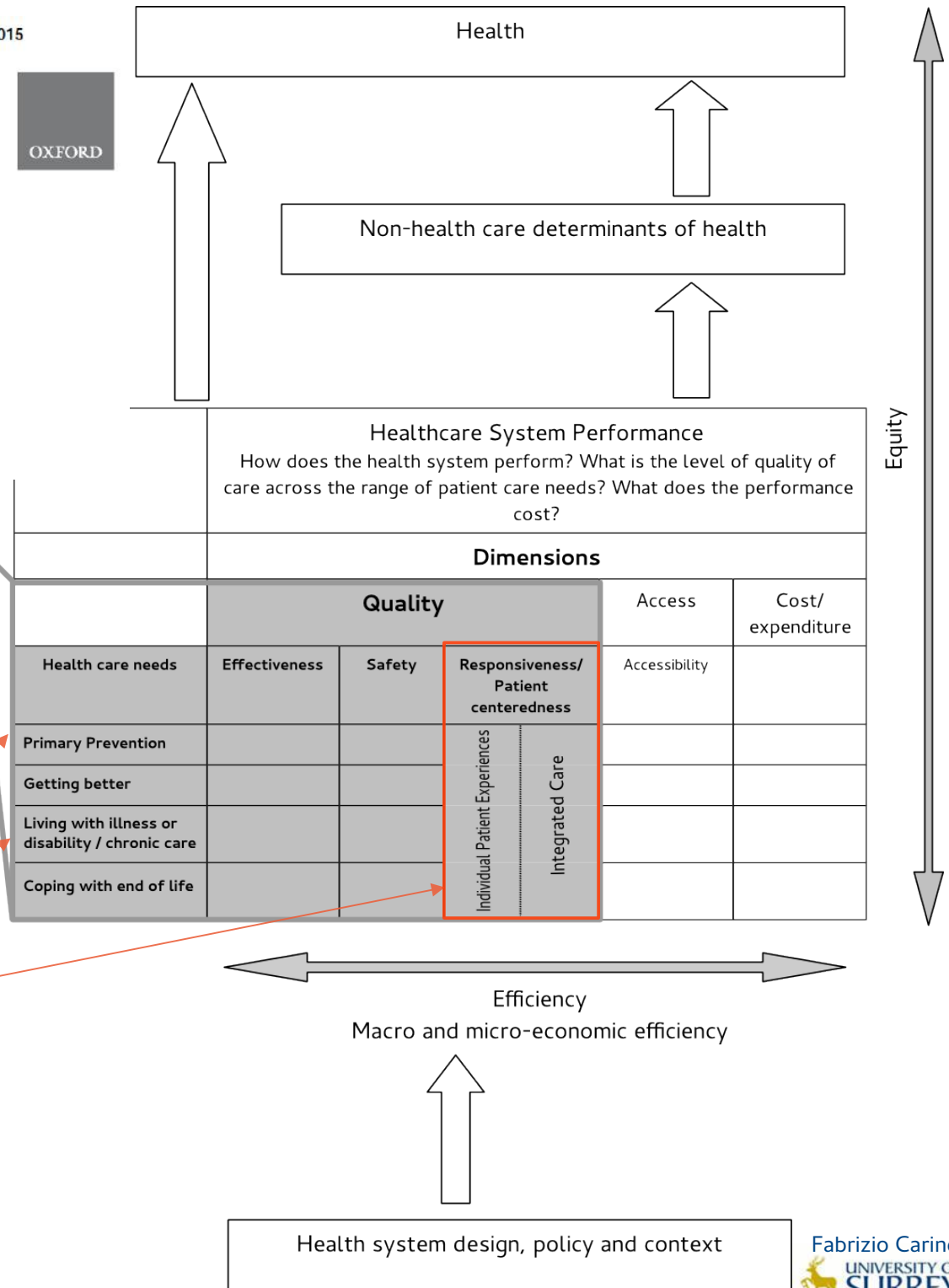
## Towards actionable international comparisons of health system performance: expert revision of the OECD framework and quality indicators

F. CARINCI<sup>1,2</sup>, K. VAN GOOL<sup>3,4</sup>, J. MAINZ<sup>5</sup>, J. VEILLARD<sup>6</sup>, E. C. PICHORA<sup>6</sup>, J. M. JANUEL<sup>7</sup>, I. ARISPE<sup>8</sup>, S. M. KIM<sup>9</sup>, and N.S. KLAZINGA<sup>3</sup>, ON BEHALF OF THE OECD HEALTH CARE QUALITY INDICATORS EXPERT GROUP\*

**Sistema di  
Valutazione delle  
Performance  
OCSE 2015:  
Indicatori "azionabili"**

**NUOVE  
DEFINIZIONI**

Current focus  
of HCQI  
project



# Effectiveness – Getting better

GETTING BETTER	AC	<b>Admission-based AMI 30 day in-hospital (same hospital) mortality</b>
		<b>Patient-based AMI 30 day (in-hospital and out of hospital) mortality</b>
		<b>Patient-based ischemic stroke 30 day (in-hospital and out of hospital) mortality</b>
		<b>Admission-based ischemic stroke 30 day in-hospital (same hospital) mortality</b>
		<b>Admission-based hemorrhagic stroke 30 day in-hospital (same hospital) mortality</b>
		<b>Patient-based hemorrhagic stroke 30 day (in-hospital and out of hospital) mortality</b>
		<b>Hip-fracture surgery initiated within 48 hours after admission to the hospital</b>
		Patient-based AMI 30 day in-hospital (any hospital) mortality
		Patient-based ischemic stroke 30 day in-hospital (any hospital) mortality
		Patient-based hemorrhagic stroke 30 day in-hospital (any hospital) mortality
CC		<b>Breast cancer five year relative survival</b>
		<b>Cervical cancer five year relative survival</b>
		<b>Colorectal cancer five year relative survival</b>
		<b><i>Breast cancer mortality in women</i></b>
		<b><i>Cervical cancer mortality</i></b>
<b><i>Colorectal cancer mortality</i></b>		
PC		<b>Overall volume of antibiotics for systemic use prescribed</b>
		<b>Volume of cephalosporins/quinolones as proportion of all systemic antibiotics prescribed</b>

Carinci F, Van Gool K, Mainz J, Veillard JH, Januel JM, Kim SM, Arispe I, and Klazinga N, Int J Qual Health Care, February 2015



# Safety – Getting better

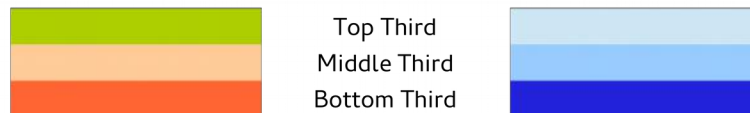
PS	<b>Retained surgical item or unretrieved device fragment (15+ yrs)</b>
	<b>Postoperative PE or DVT (all surgical discharges)</b>
	<b>Postoperative PE or DVT (hip and knee discharges)</b>
	<b>Postoperative sepsis (all surgical discharges)</b>
	<b>Postoperative sepsis (all abdominal discharges)</b>
	<b>Postoperative wound dehiscence (15+ yrs)</b>
	Retained surgical item or unretrieved device fragment (0-14 yrs)
PC	Accidental puncture or laceration (0-14 yrs)
	Accidental puncture or laceration (15+ yrs)
	Postoperative haemorrhage or haematoma (0-14 yrs)
	Postoperative wound dehiscence (0-14 yrs)
	Postoperative haemorrhage or haematoma (15+ yrs)
	<b>Long-term use of benzodiazepines/benzodiazepine-related drugs in elderly patients</b>
<b>Use of long-acting benzodiazepines in elderly patients</b>	
<b>Pilot of prescription safety indicators (6 indicators)</b>	

Carinci F, Van Gool K, Mainz J, Veillard JH, Januel JM, Kim SM, Arispe I, and Klazinga N, Int J Qual Health Care, February 2015

# Performance Dashboards

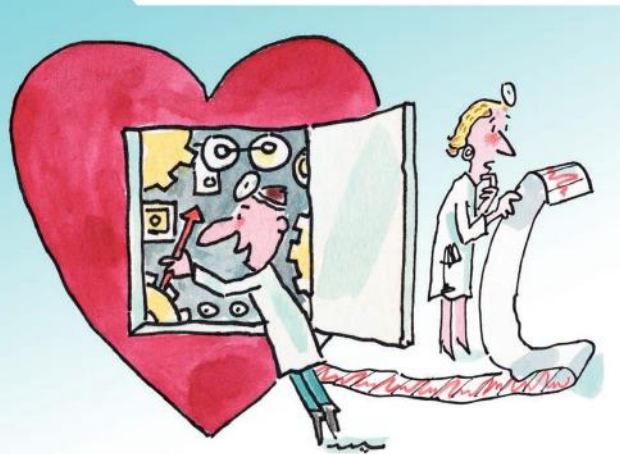
Source: OECD Health at a Glance 2015

Health Status	Life Expectancy at Birth – Men	Life Expectancy at Birth – Women	Life Expectancy at 65 – Men	Life Expectancy at 65 – Women	Mortality from Cardiovascular Diseases		
	3	4	8	4	17		
Risk Factors	Smoking in Adults	Alcohol Consumption	Obesity in Adults	Overweight and Obesity in Children			
	24	4	4	31			
Access to Care	Health Care Coverage	Share of Out of Pocket Medical Expenditure in Household Consumption	Unmet Medical Care Needs	Unmet Dental Care Needs			
	1	22	20	21			
Quality of Care	Asthma and COPD Hospital Admission	Diabetes Hospital Admission	Case-fatality for AMI (admission-based)	Case-fatality for ischemic stroke (admission based)	Cervical Cancer Survival	Breast Cancer Survival	Colorectal Cancer Survival
	2	1	5	7	3	15	12
Health Care Resources	Health expenditure per capita	Doctors per capita (active)	Nurses per capita (active)	Hospital beds per capita	MRI units per capita	CT scanners per capita	
	20	8	24	19	3	9	



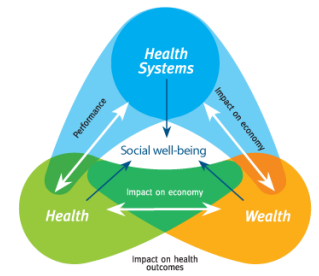
# Italian Health Care Quality Review

Source: OECD 2015



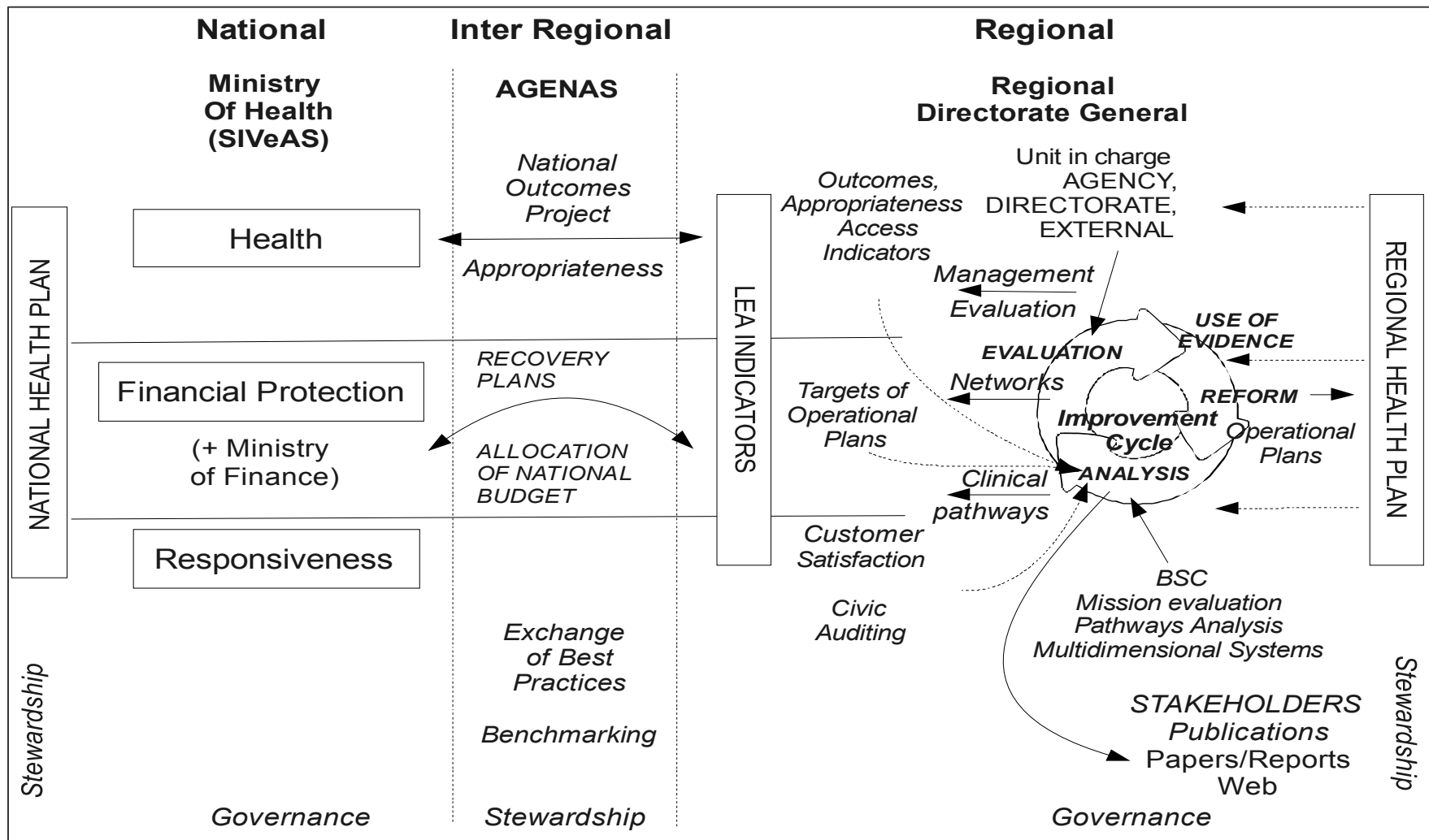
- **Ridurre la variabilità regionale e concentrarsi su qualità, non solo sulla riduzione dei costi**
- **Estendere l'infrastruttura informativa e la valutazione della performance**
- Assicurare una applicazione più consistente e rapporti regolari sulle iniziative per la qualità e gli standard minimi, incluse le cure primarie
- Espandere le cure di comunità e le linee guida per pazienti anziani con patologie multiple, e le cure integrate
- Migliorare il ruolo dei fornitori di cure primarie nella prevenzione primaria e secondaria
- **Sviluppare forme più ambiziose di controllo della qualità e sviluppo della forza lavoro in sanità, ad esempio attraverso il rinnovo delle licenze, la revisione tra pari, ed indicatori di qualità ed esito a livello di singolo professionista**

# Programmazione e gestione della performance in un sistema decentrato



Carinci F, Caracci G, Di Stanislao F, Moirano F. Performance measurement in response to the Tallinn Charter: experiences from the decentralized Italian framework, Health Policy. 2012 Nov;108(1):60-6

WHO Europe Tallinn Charter



# Argomenti

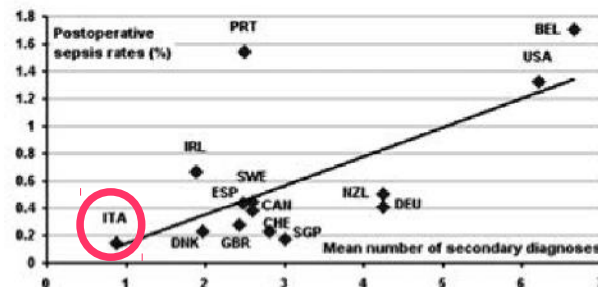
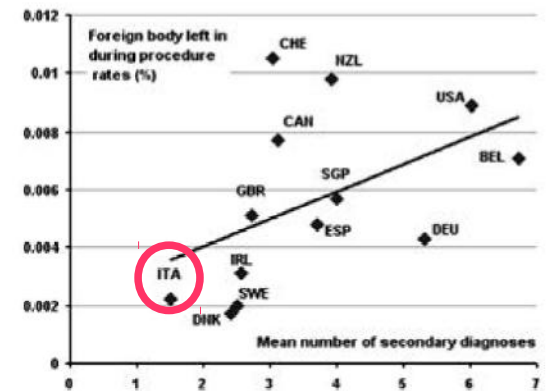
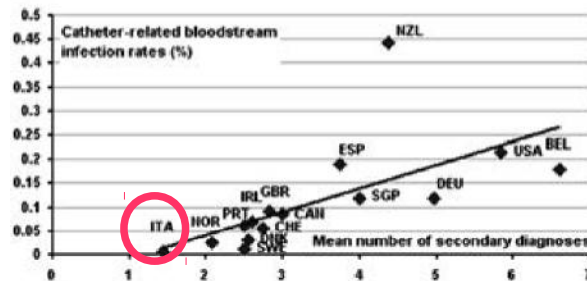
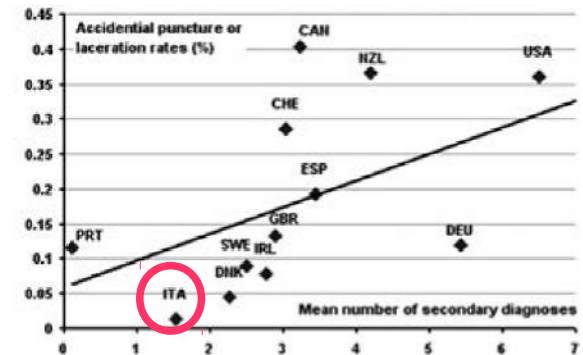
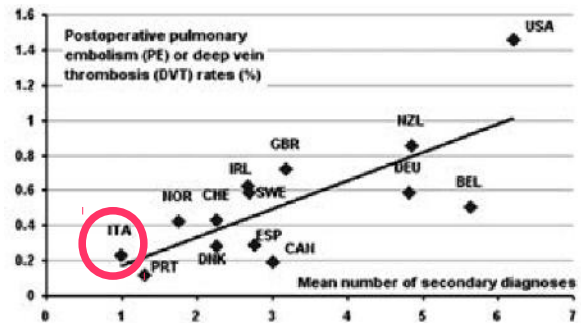
- 1. Perché valutare la Performance dei sistemi sanitari?**
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# International comparability of Patient Safety Indicators in 15 OECD Member Countries (1)

Drösler SE, Romano PS, Tancredi DJ, Klazinga NS, International Comparability of Patient Safety Indicators in 15 OECD Member Countries: A Methodological Approach of Adjustment by Secondary Diagnoses, Health Serv Res. Feb 2012; 47(1 Pt 1): 275–292.

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3447235>

**Age-sex standardized rates for 5 Patient Safety Indicators in 15 OECD Countries, Year 2007**

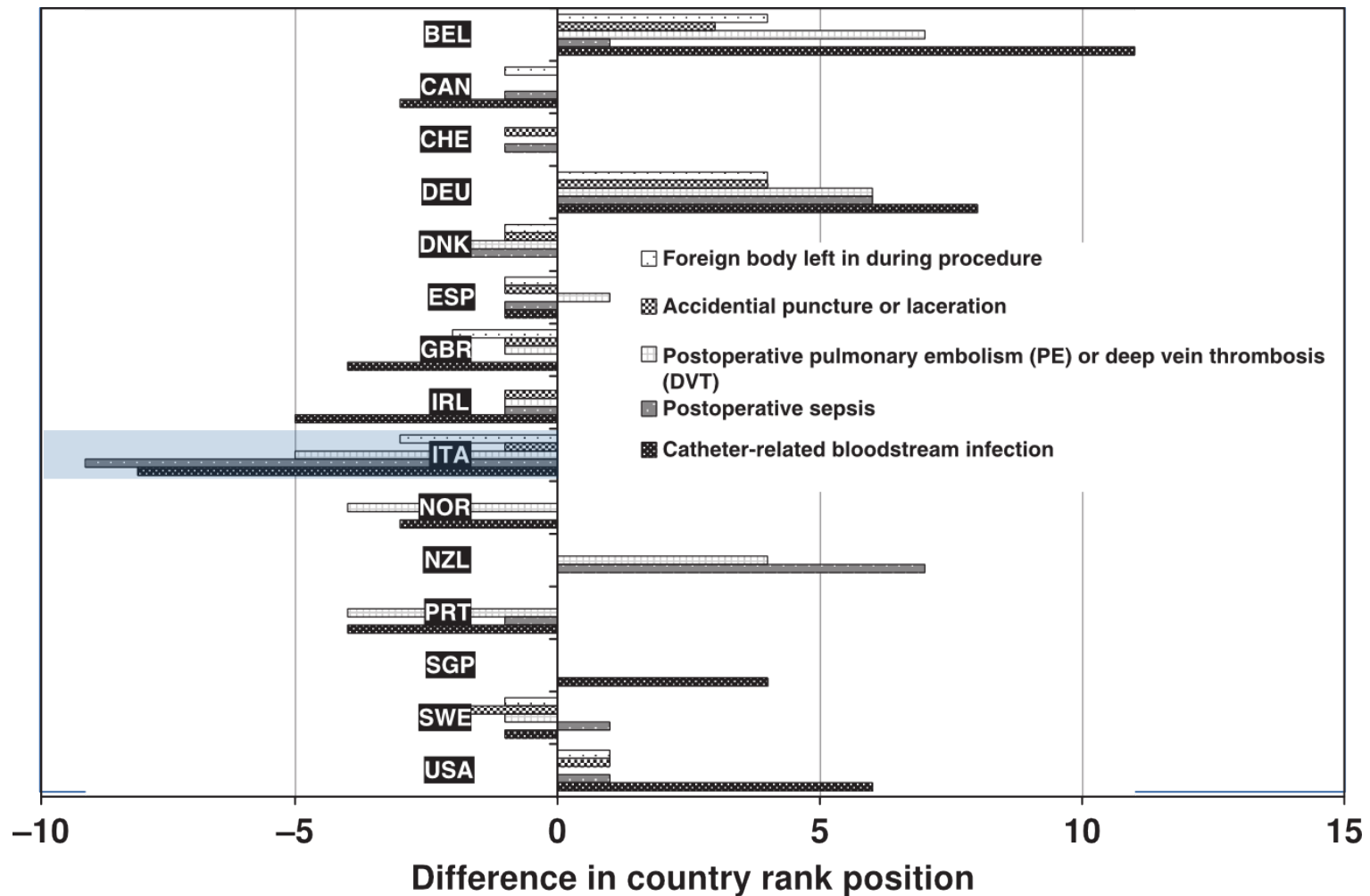


Mean Number of Secondary Diagnoses

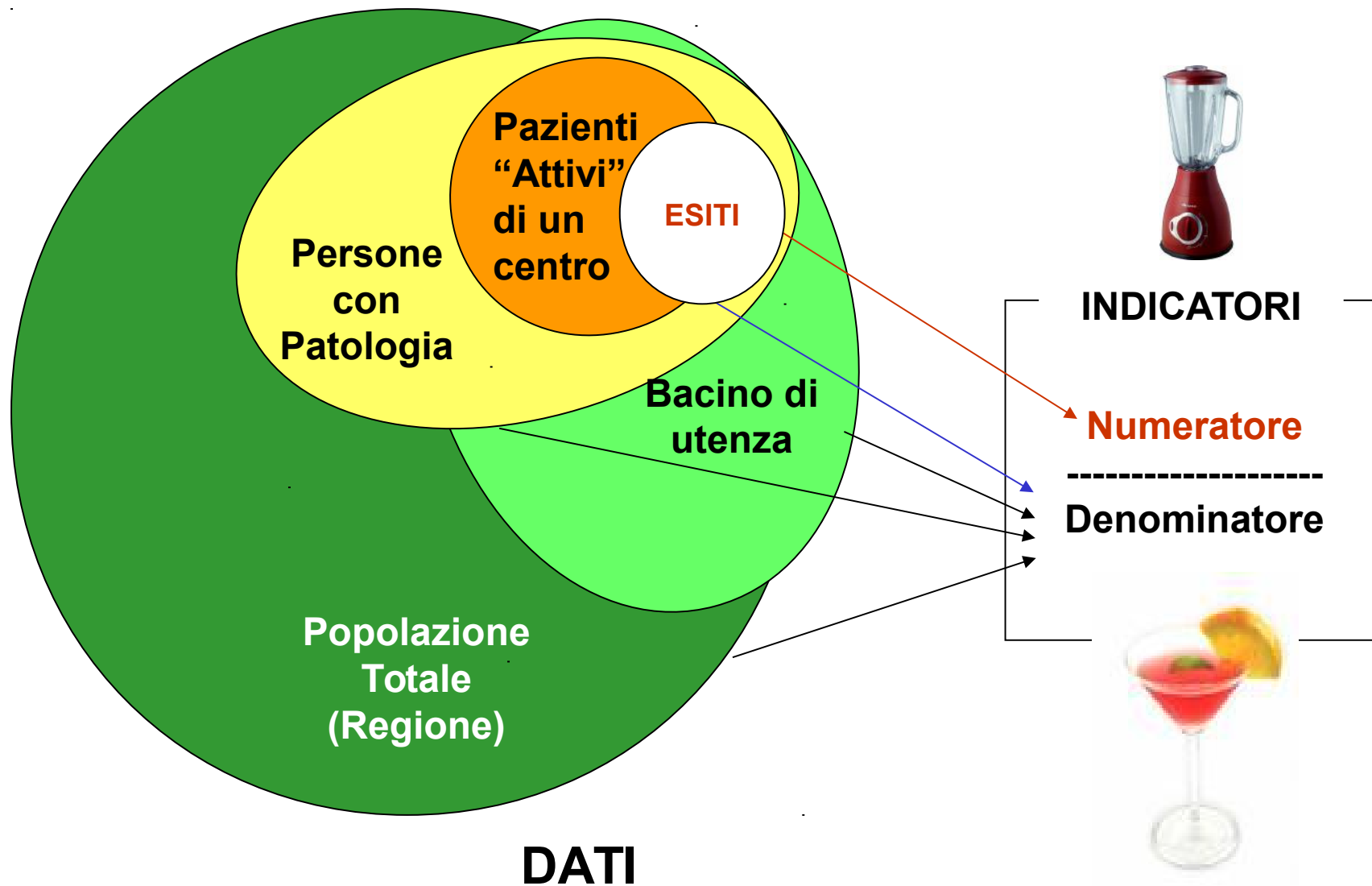
# International comparability of Patient Safety Indicators in 15 OECD Member Countries (2)

## CHANGE IN COUNTRY RANKING AFTER ADJUSTMENT BY NUMBER OF SECONDARY DIAGNOSES

Drösler et al, Health Serv Res. Feb 2012; 47(1 Pt 1): 275–292

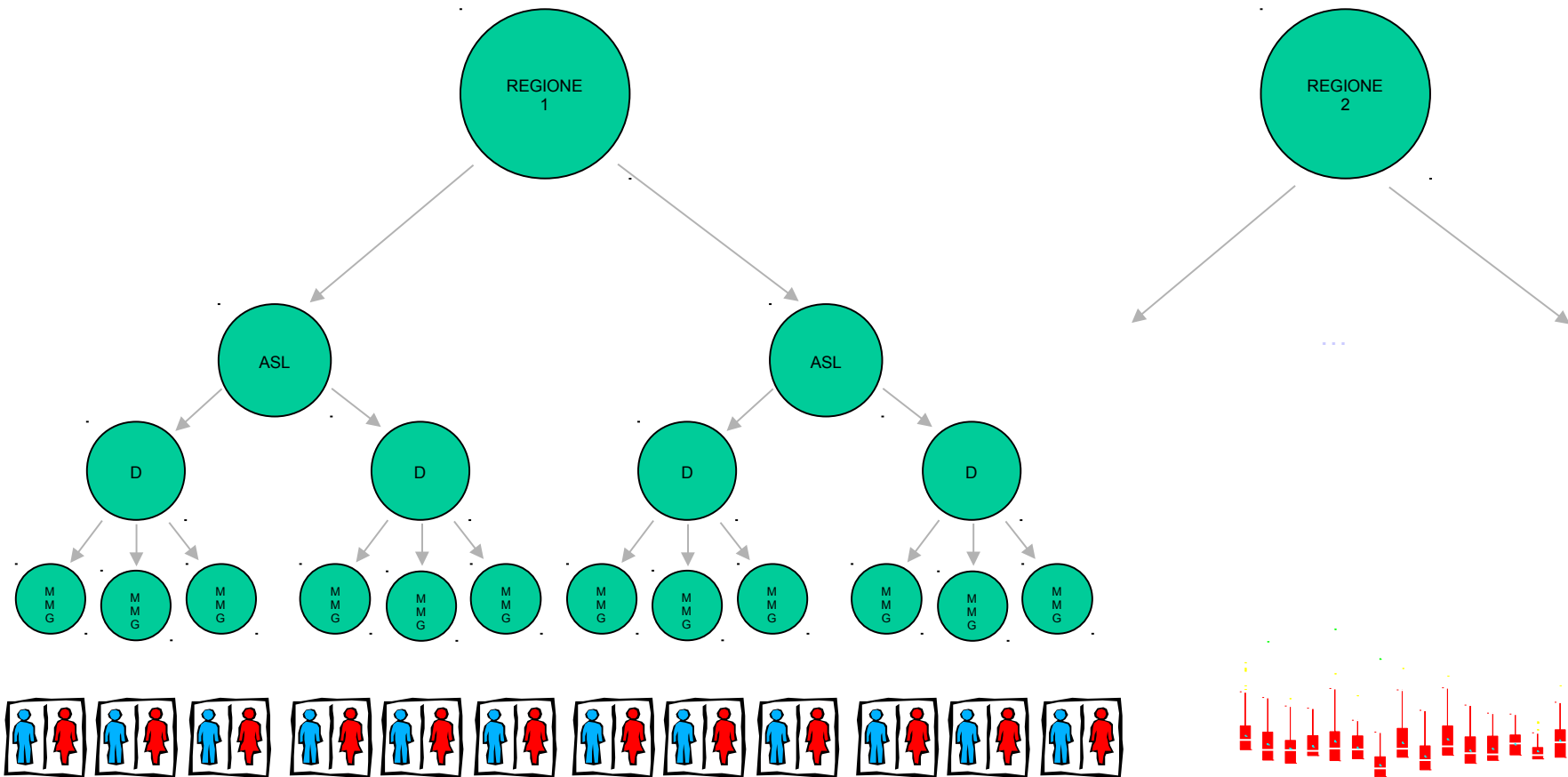


# Il „selection bias“ nei dati di routine basati sulla popolazione (es. patologia cronica)





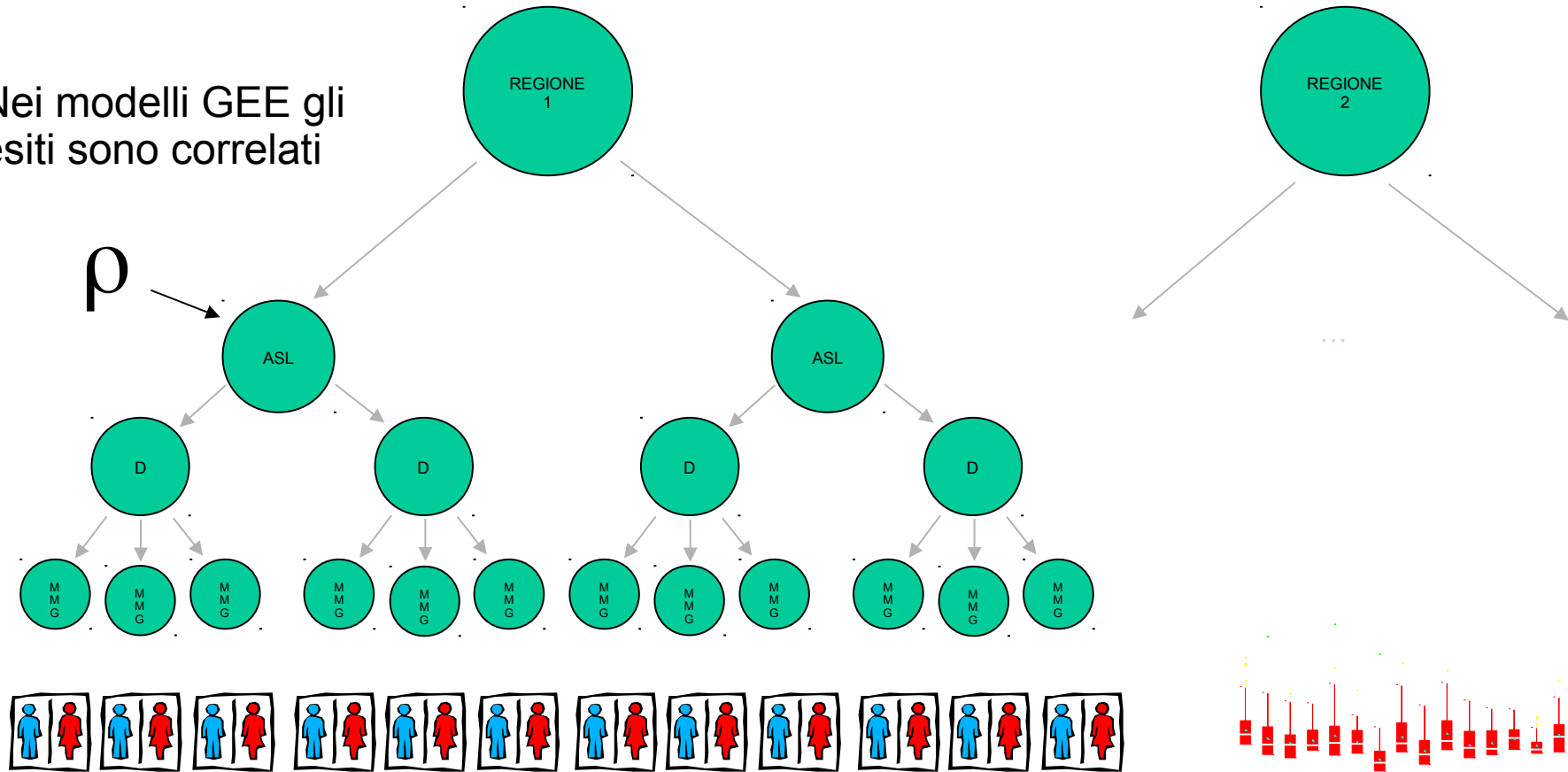
# Effetti „a cluster“



**MODELLING**

# Effetti „a cluster“

Nei modelli GEE gli esiti sono correlati

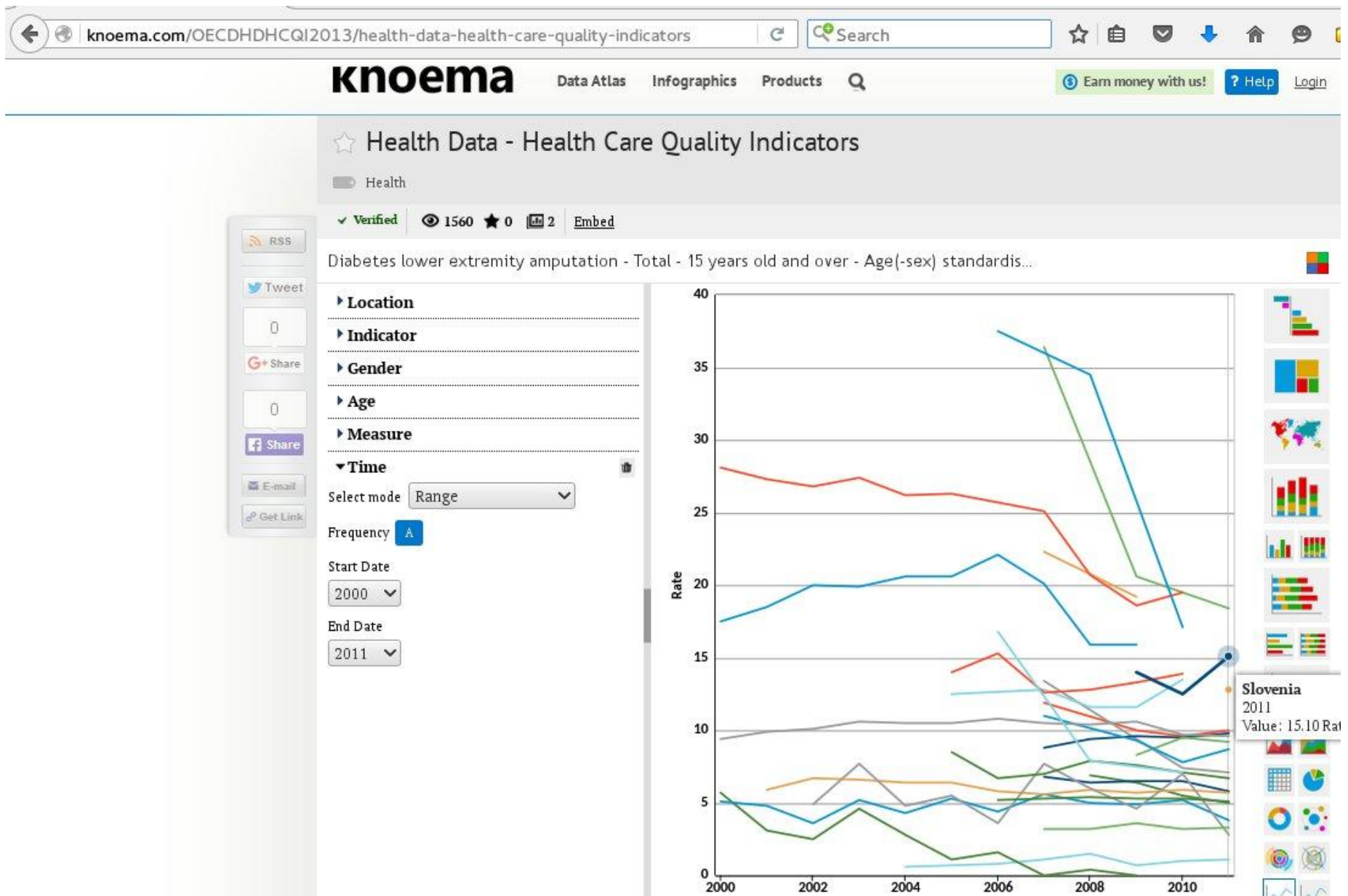


## MODELLING

# Amputazioni nel diabete: stiamo migliorando?

- L'amputazione degli arti inferiori è un esito clinico riconosciuto nella naturale evoluzione del diabete, che è stato ampiamente usato per monitorare la qualità della cura nella pratica clinica
- A 25 anni dalla St.Vincent Declaration, c'è ancora una informazione limitata a livello internazionale per confrontare le amputazioni agli arti inferiori nel diabete.
- L'OCSE ha incluso le amputazioni nella raccolta dati internazionale del progetto Health Care Quality Indicators a partire dal 2006. Non c'è stato però mai sufficiente accordo per inserirne i risultati nella pubblicazione "Health at a Glance", volume nel quale vengono pubblicati i risultati principali del progetto.
- Dati apparentemente semplici, analisi complessa e potenzialmente contraddittoria

# Amputation Rates in Diabetes (OECD 2013)



# Tasso di amputazioni degli arti inferiori nel Diabete OCSE 2000-2011

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5014879/>

Acta Diabetol  
DOI 10.1007/s00592-016-0879-4

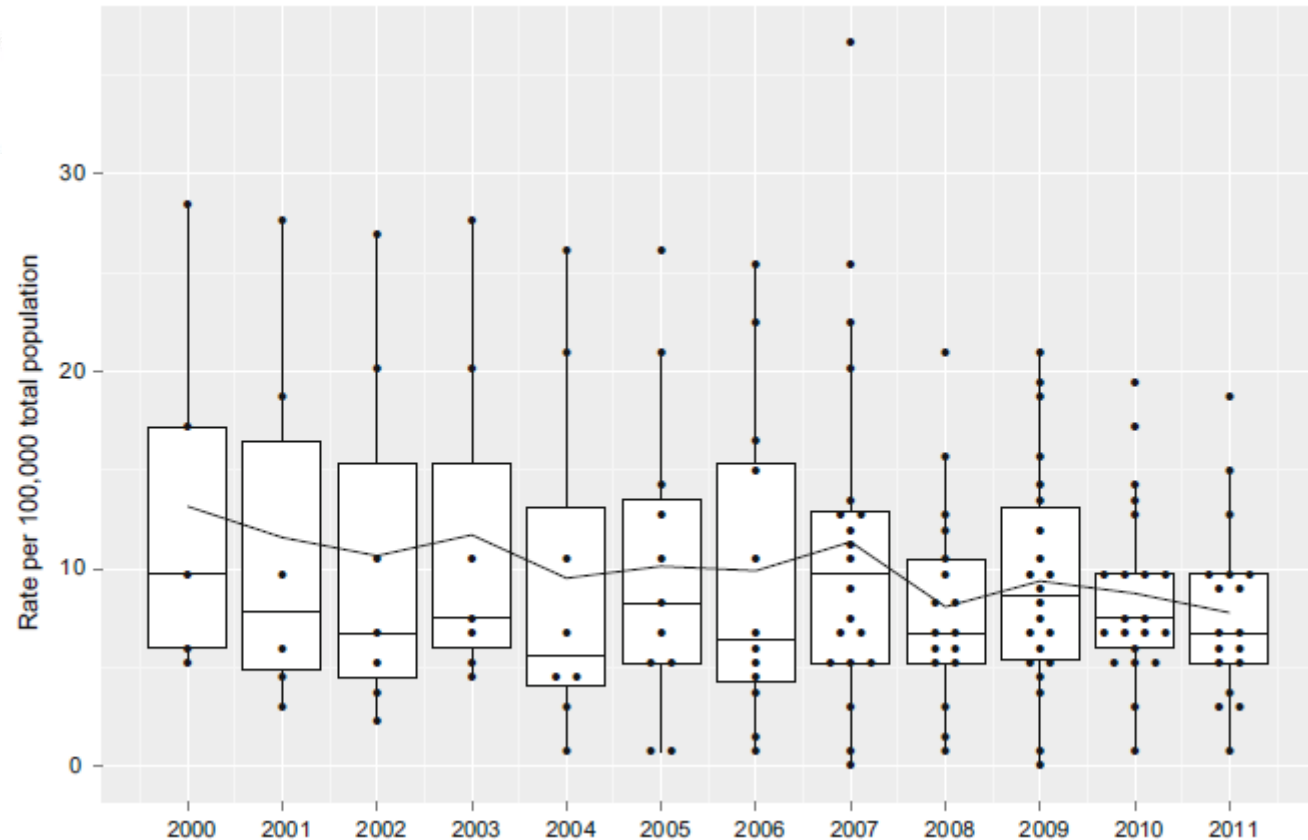


ORIGINAL ARTICLE

## Lower extremity amputation rates in people with diabetes as an indicator of health systems performance. A critical appraisal of the data collection 2000–2011 by the Organization for Economic Cooperation and Development (OECD)

F. Carinci<sup>1</sup> · M. Massi Benedetti<sup>2</sup> · N. S. Klazinga<sup>3,4</sup> · L. Uccioli<sup>5</sup>

Received: 15 January 2016 / Accepted: 20 June 2016



# Tasso di amputazioni degli arti inferiori nel Diabete OECD 2000-2011

*L.Uccioli, M.Massi Benedetti, N.Klazinga and F.Carinci, Lower extremity amputation rates in diabetes as an indicator of health systems performance: a critical appraisal of the OECD data collection 2000-2011, Submitted 2015*

## SAS source code

```
proc genmod data=retro;  
class Country;  
model value=primary_tax Year;  
repeated subject = Country / type=exch corrw; run; quit;
```

## Initial GEE model output

### Analysis Of Initial Parameter Estimates

Parameter	DF	Estimate	Standard Error	Wald	95% Confidence Limits	Chi-Square	Pr>ChiSq
Intercept	1	14.6734	1.4494	11.8325	17.5142	102.48	<.0001
primary_tax	1	-5.3978	1.1116	-7.5766	-3.2191	23.58	<.0001
Year	1	-0.3110	0.1810	-0.6657	0.0436	2.95	0.0856
Scale	1	6.9018	0.3907	6.1770	7.7118		

# Tasso di amputazioni degli arti inferiori nel Diabete OCSE 2000-2011

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**Table 3** Results of multivariate linear regression (generalized estimating equations), OECD 2000–2011 *Source* OECD health system characteristics survey, 2012; health care quality indicators project (revised version, data collection 2013)

Model/Variable	Estimate	S.E.	95 %C.I.	<i>P</i> > <i>Z</i>
<b>Model 1 [Complete dataset; N countries = 26]</b>				
Tax-based system	-4.55	1.95	-8.38, -0.72	0.020
Use of registry	2.93	2.53	-2.03, 7.89	0.247
Non-ICD coding	-7.04	2.14	-11.24, -2.84	0.001
Average year change	-0.27	0.11	-0.50, -0.05	0.015
<b>Model 2 [Financing: Tax-based; N countries = 12; Median LEARD: 7.55 (2000), 6.25 (2011)]</b>				
Average Year Change	-0.16	0.09	-0.33, 0.01	0.064
<b>Model 2 [Financing: Social insurance; N countries = 14; Median LEARD: 17.50 (2000), 8.15 (2011)]</b>				
Average year change	-0.36	0.18	-0.71, -0.01	0.046

# Studio OCSE Tasso di amputazioni degli arti inferiori nel Diabete

## Analisi delle SDO nazionali (Carinci et al 2015)

Italia 2002-2013 (N=99.649.200)

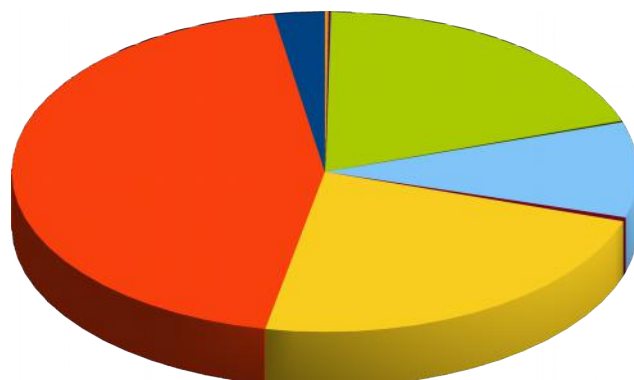
Totale 2013: N=7.272.173; N 250xx=522.335 (7.2%)

### Distribuzione dei Soggetti Amputati per Procedura ICD

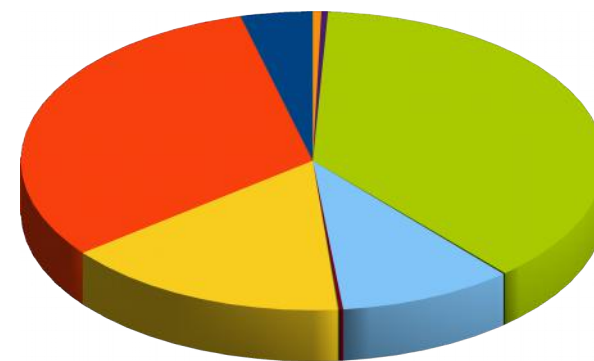
con ICD 250.xx stesso ricovero

no ICD 250.xx stesso ricovero ma ICD 250.xx in precedente ricovero

con diabete  
N=7.700

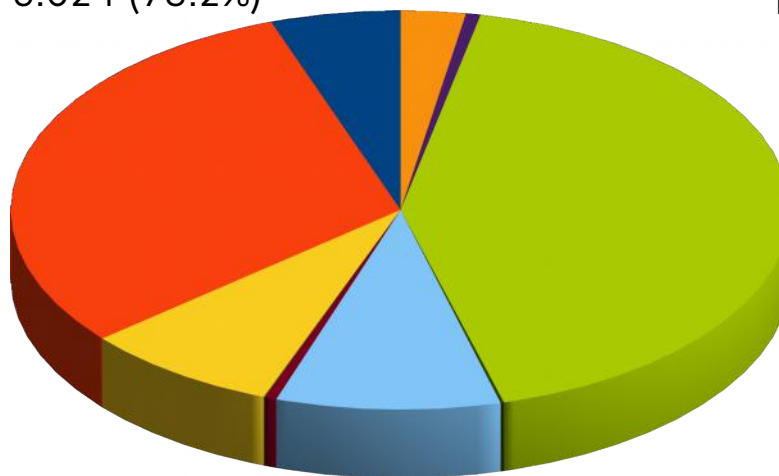


N=6.024 (78.2%)



N=1.676 (21.8%)

senza diabete  
N=4.149



ICD Procedure

■ 84.10 ■ 84.11 ■ 84.12 ■ 84.13 ■ 84.14 ■ 84.15 ■ 84.16 ■ 84.17 ■ 84.18 ■ 84.19



# Tasso di amputazioni degli arti inferiori nel Diabete

Tassi Standardizzati per Paese (Età ≥ 15 anni), Anno 2013 o ultimo disponibile

— Mean  
— Median

## Denominator

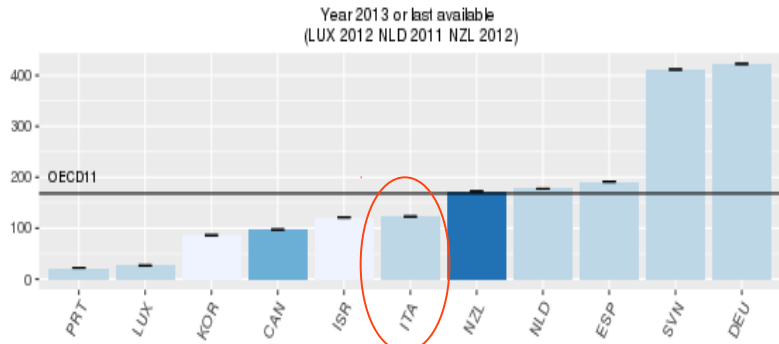
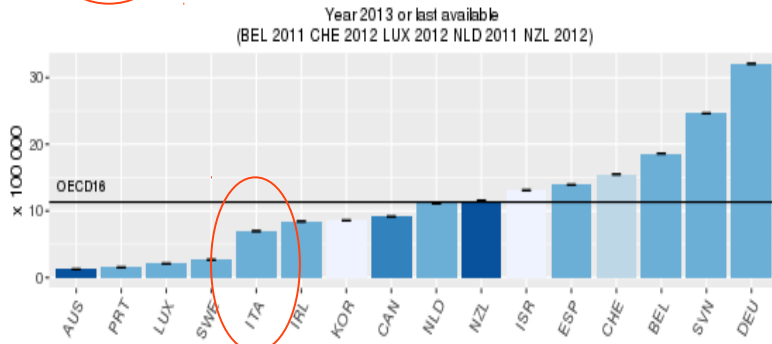
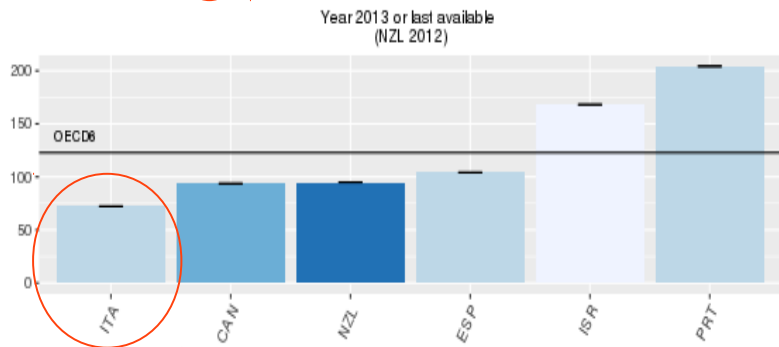
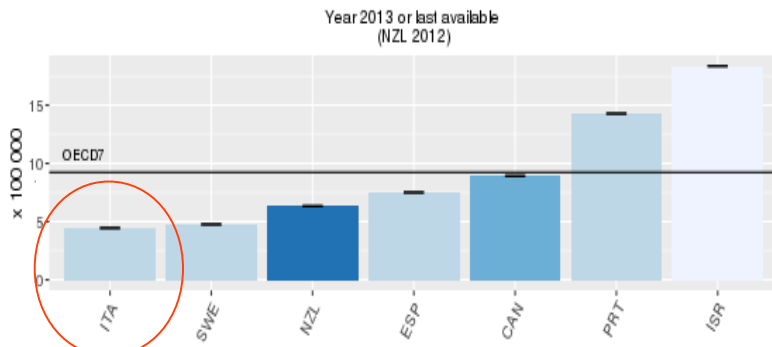
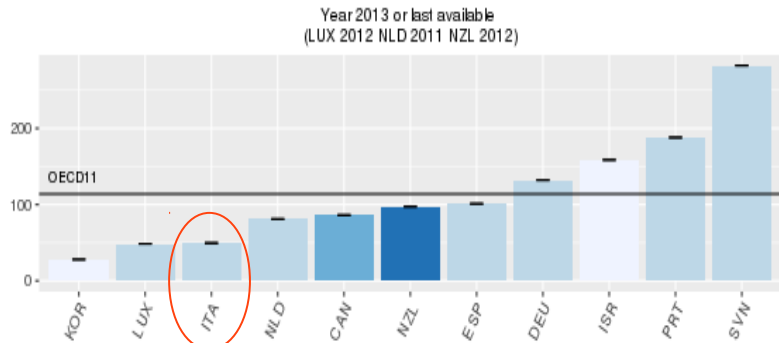
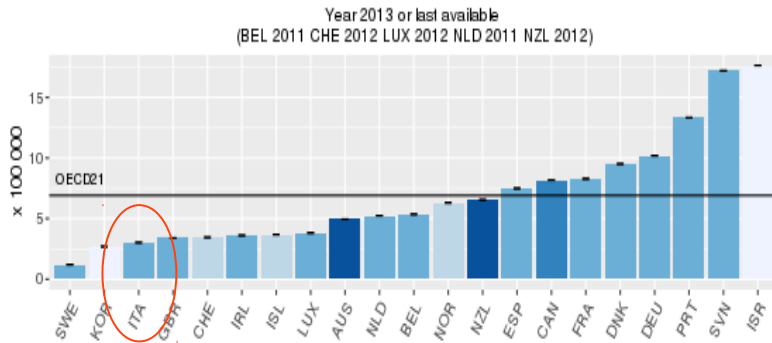
**Total Population**

Year 2013 or last available  
(BEL 2011 CHE 2012 LUX 2012 NLD 2011 NZL 2012)

**People with Diabetes**

Year 2013 or last available  
(LUX 2012 NLD 2011 NZL 2012)

Major  
Major Patient Based  
Minor



Continent

- Asia
- Europe
- Europe - EU
- North America
- Oceania

# Tasso di amputazioni degli arti inferiori nel Diabete

Tassi Standardizzati per Paese (Età ≥ 15 anni), Anni 2000-2013

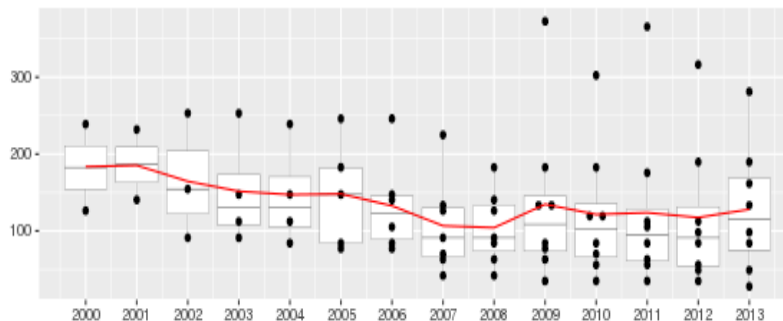
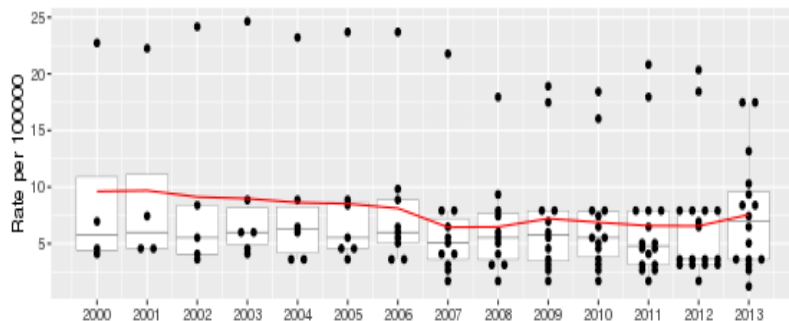
## Denominator

Total Population

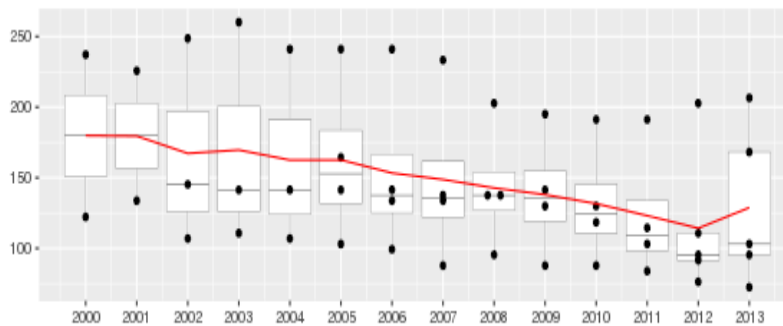
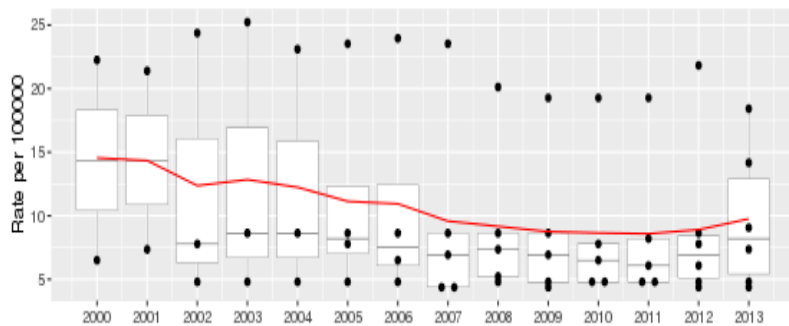
People with Diabetes

— Mean  
— Median

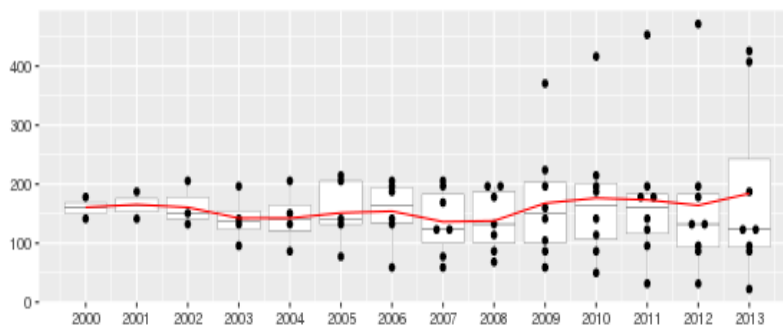
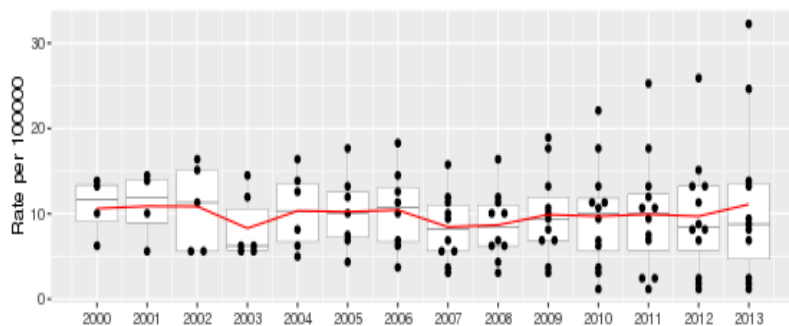
Major



Major  
Patient  
Based



Minor

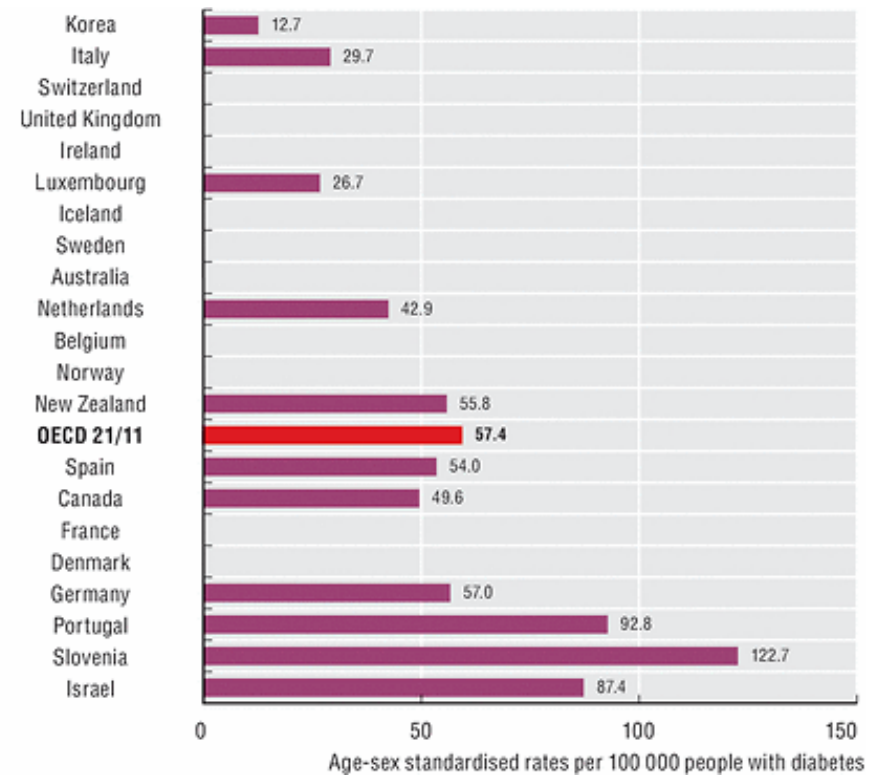
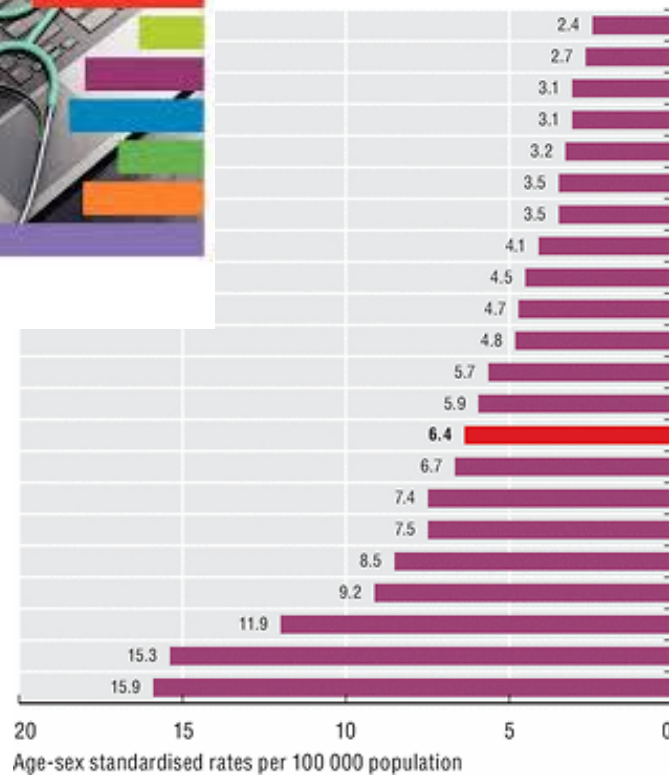


Numerator

# Major lower extremity amputation in adults with diabetes, 2013

Source: OECD Health at a Glance 2015

<http://www.oecd.org/health/health-systems/health-at-a-glance-19991312.htm>



# OECD 2015 – Tassi di amputazione

## I risultati applicati all'Italia 2002-2013

- Nel 2013, usando la definizione OCSE più accurata tra quelle raccomandate dalla nuova revisione, abbiamo trovato un totale di 2.623 amputazioni maggiori in Italia.
- Il risultato è sostanzialmente inferiore (metà) rispetto alla media OCSE riscontrata nel 2013.
- Ma dice anche che ogni **3 ore e mezza, 1 persona con diabete** viene sottoposta ad **1 amputazione maggiore**.
- Mentre questa riduzione deve continuare a migliorare in futuro, c'è ancora bisogno di pianificare e monitorare tale condizione su base continuativa. Dati precisi sui costi per l'intera cura del piede diabetico non sono ancora disponibili, mentre quelli esistenti si basano su studi a campione non facilmente generalizzabili.

# Argomenti

- 1. Perché valutare la Performance dei sistemi sanitari?**
2. Perché c'è bisogno delle Scienze Statistiche?
3. Che sfide si aprono con i "Big Data"?
4. Quale futuro per le Statistiche della Salute?

# Big Data

## Volume SCALE OF DATA

**40 ZETTABYTES**  
[ 43 TRILLION GIGABYTES ]  
of data will be created by 2020, an increase of 300 times from 2005

**6 BILLION PEOPLE**  
have cell phones

**WORLD POPULATION: 7 BILLION**

It's estimated that **2.5 QUINTILLION BYTES**  
[ 2.3 TRILLION GIGABYTES ]  
of data are created each day

Most companies in the U.S. have at least **100 TERABYTES**  
[ 100,000 GIGABYTES ]  
of data stored

## The FOUR V's of Big Data

From traffic patterns and music downloads to web history and medical records, data is recorded, stored, and analyzed to enable the technology and services that the world relies on every day. But what exactly is big data, and how can these massive amounts of data be used?

As a leader in the sector, IBM data scientists break big data into four dimensions: **Volume, Velocity, Variety and Veracity**

Depending on the industry and organization, big data encompasses information from multiple internal and external sources such as transactions, social media, enterprise content, sensors and mobile devices. Companies can leverage data to adapt their products and services to better meet customer needs, optimize operations and infrastructure, and find new sources of revenue.

By 2015 **4.4 MILLION IT JOBS** will be created globally to support big data, with 1.9 million in the United States



## Variety DIFFERENT FORMS OF DATA

As of 2011, the global size of data in healthcare was estimated to be **150 EXABYTES**  
[ 161 BILLION GIGABYTES ]

**30 BILLION PIECES OF CONTENT** are shared on Facebook every month

**400 MILLION TWEETS** are sent per day by about 200 million monthly active users

**4 BILLION+ HOURS OF VIDEO** are watched on YouTube each month

By 2014, it's anticipated there will be **420 MILLION WEARABLE, WIRELESS HEALTH MONITORS**

## Velocity ANALYSIS OF STREAMING DATA

The New York Stock Exchange captures **1 TB OF TRADE INFORMATION** during each trading session

Modern cars have close to **100 SENSORS** that monitor items such as fuel level and tire pressure

By 2016, it is projected there will be **18.9 BILLION NETWORK CONNECTIONS** - almost 2.5 connections per person on earth

## Veracity UNCERTAINTY OF DATA

**1 IN 3 BUSINESS LEADERS** don't trust the information they use to make decisions

**27% OF RESPONDENTS** in one survey were unsure of how much of their data was inaccurate

Poor data quality costs the US economy around **\$3.1 TRILLION A YEAR**

Sources: McKinsey Global Institute, Twitter, Cisco, Gartner, EMC, SAS, IBM, MEPEEC, QAS

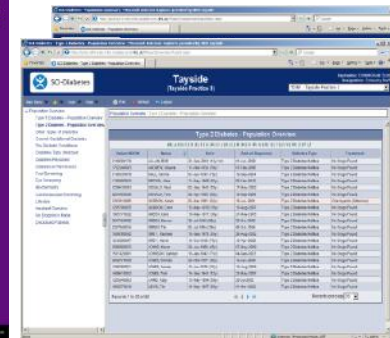
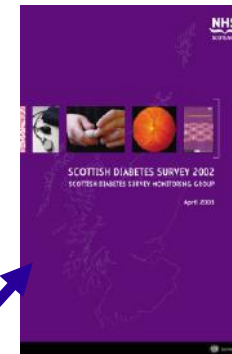
## Registro Diabete Scozia



Laboratory Results



Community Health Index



Audit and Reporting



Primary Care Systems



Secondary Care Systems



Inpatient Linkage



Diabetic Retinopathy Screening



my diabetes my way



Scottish Diabetes Research Network

# Canada: Your Health System

<https://yourhealthsystem.cihi.ca>

## Your Health System

### Hospital Deaths (HSMR)

This indicator of health care quality measures whether the number of deaths at a hospital is higher or lower than you would expect, based on the average experience of Canadian hospitals (set at 100 in 2012–2013). When tracked over time, this measure can indicate whether hospitals have been successful in reducing patient deaths and improving care.

More

Every year,  
more than

**150,000**

Canadians die in hospitals

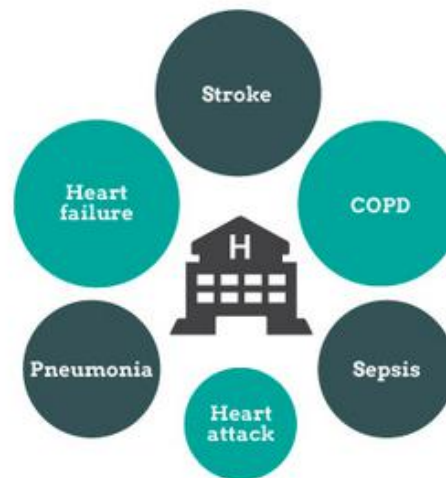
This is about **63%**



of all deaths in Canada

(Source: Statistics Canada, 2012)

Top causes of death in  
Canadian hospitals



(Source: CIHI, 2014)

Canada's hospital  
mortality ratio

(the number of actual deaths relative  
to the number of expected deaths)



(Source: CIHI)

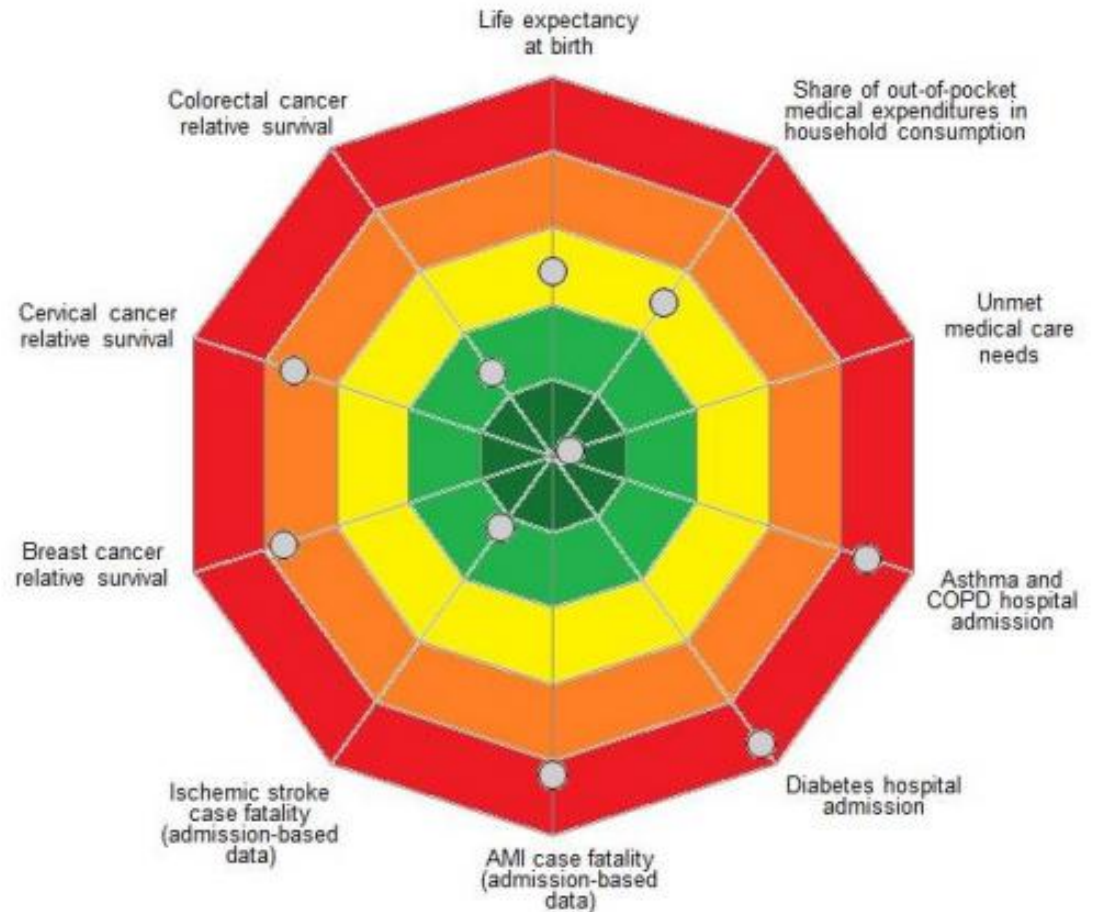


# Dartboard diagram

To visually represent the results of the six areas, each organization is presented with a specific "target" diagram, divided into five assessment bands.

The closer the organization is to the target level of each performance indicator, the nearer the relative circle will be to the centre.

This approach is nice, but it has known methodological limitations and interpretative drawbacks. **There is no perfect graphical representation!**



# Canada: confronto tra Province vs Canada vs risultati medi OCSE

**Figure A:** How provinces compare with OECD countries on Quality of Care indicators

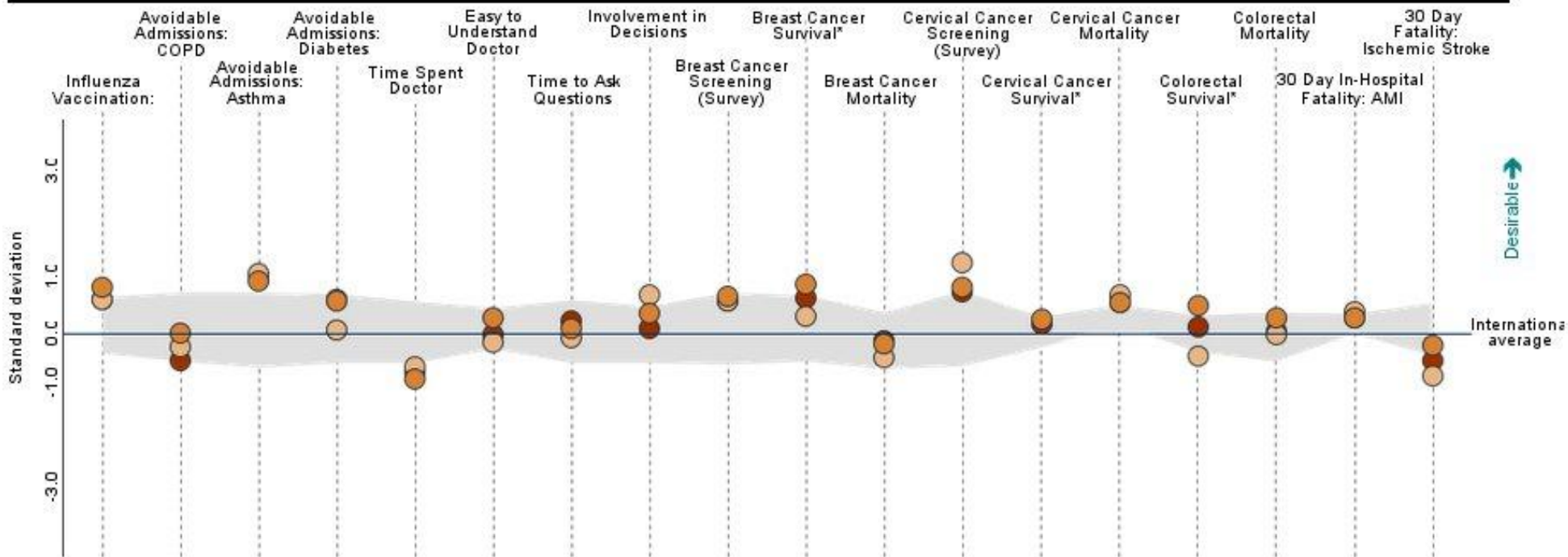


Figure A presents Canadian and provincial results relative to the OECD average, measured in standard deviations. The shaded band represents the area between the top and bottom quarters (25th and 75th percentiles) of OECD countries.

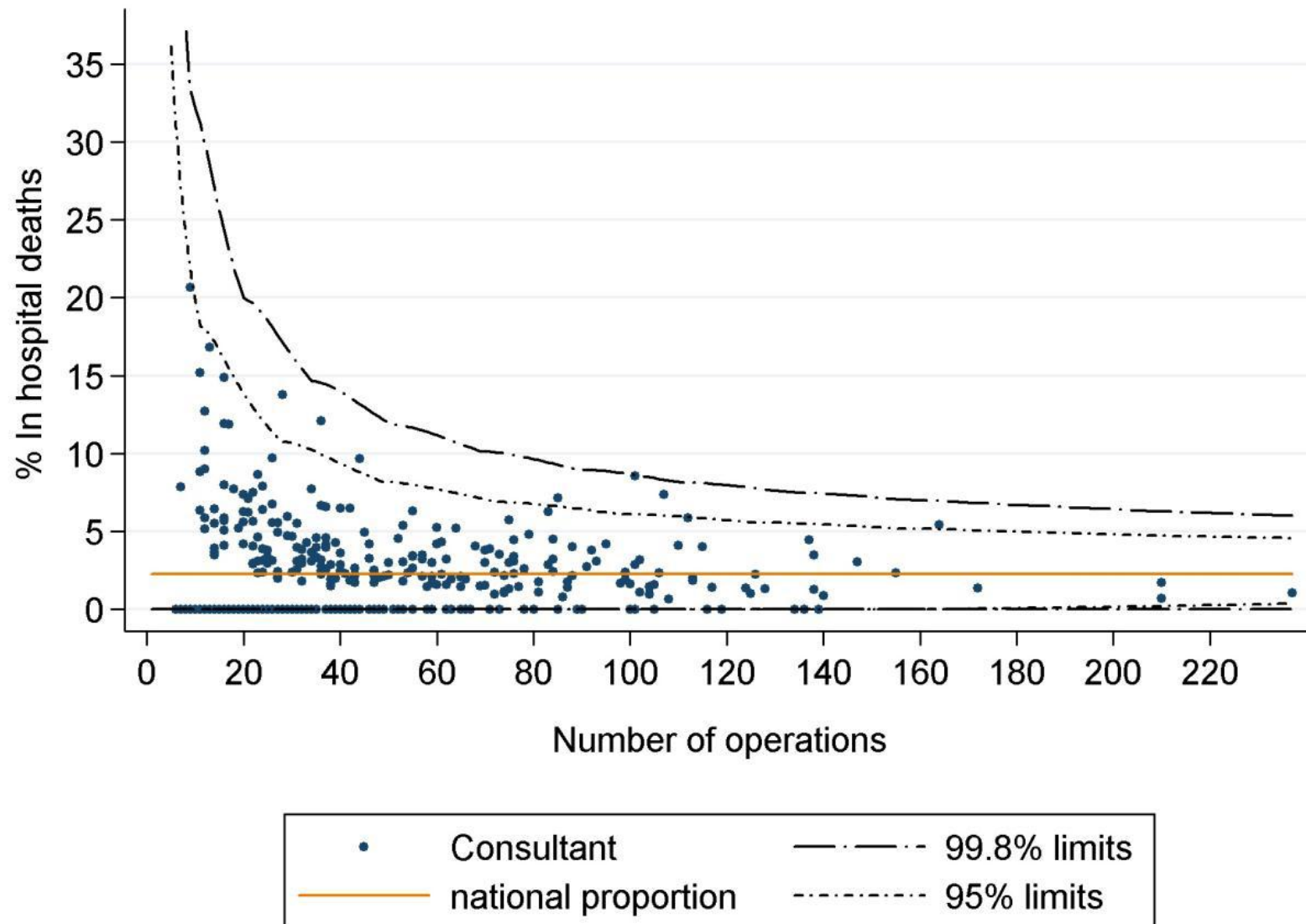
\* Not available for all provinces.

Select province

- CAN
- N.L.
- P.E.I.
- N.S.
- N.B.
- Que.
- Ont.
- Man.
- Sask.
- Alta.
- B.C.

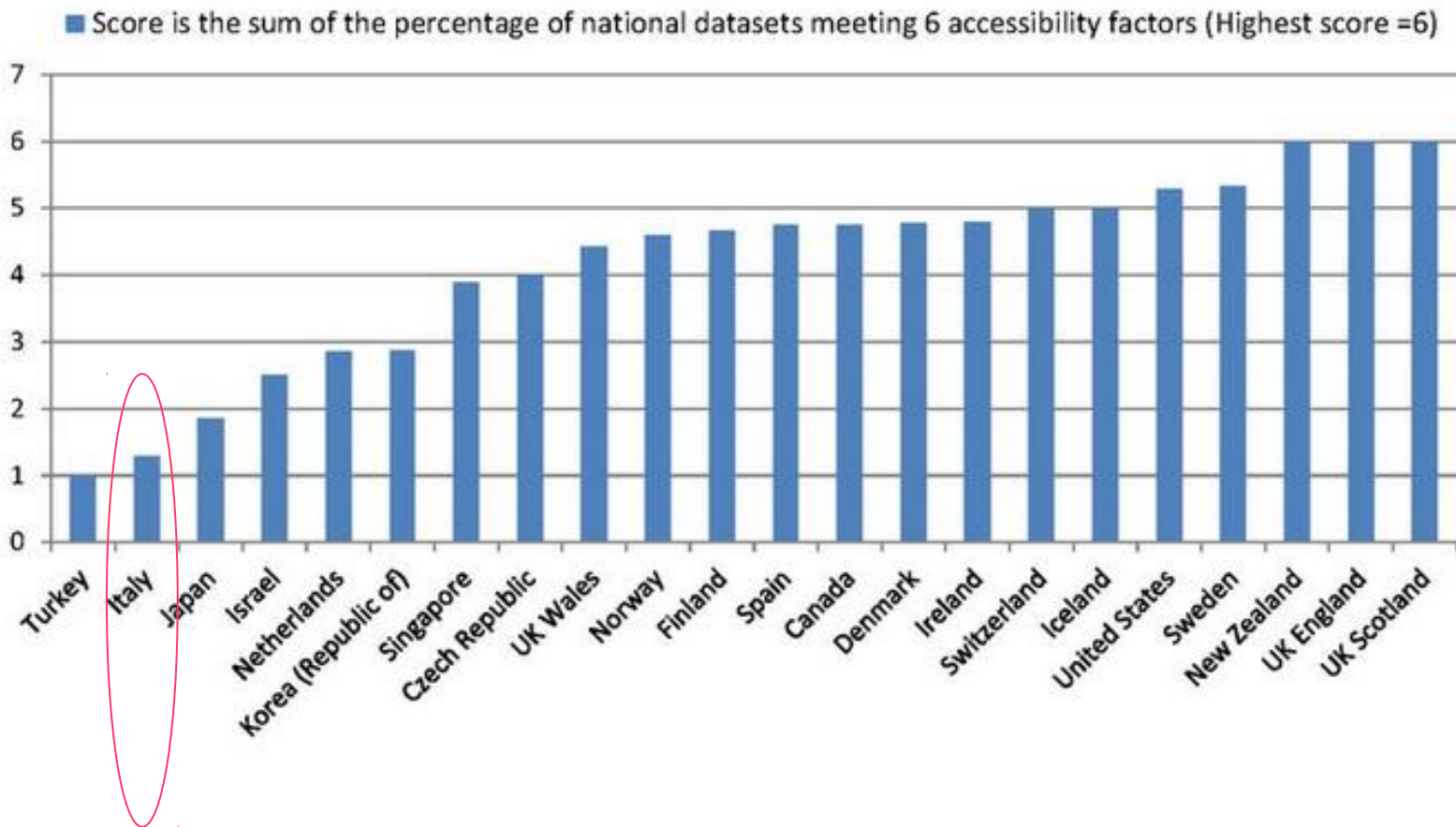
# UK: Funnel Plots

Risk-adjusted in-hospital mortality after elective abdominal aortic aneurysm repair: surgeon figures in comparison to national average



# Accessibilità dei dati sanitari

**Figure 3.1. Sharing and accessibility of health data for approved statistical and research uses**

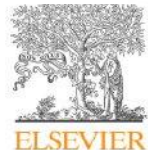




Contents lists available at ScienceDirect

## Journal of Biomedical Informatics

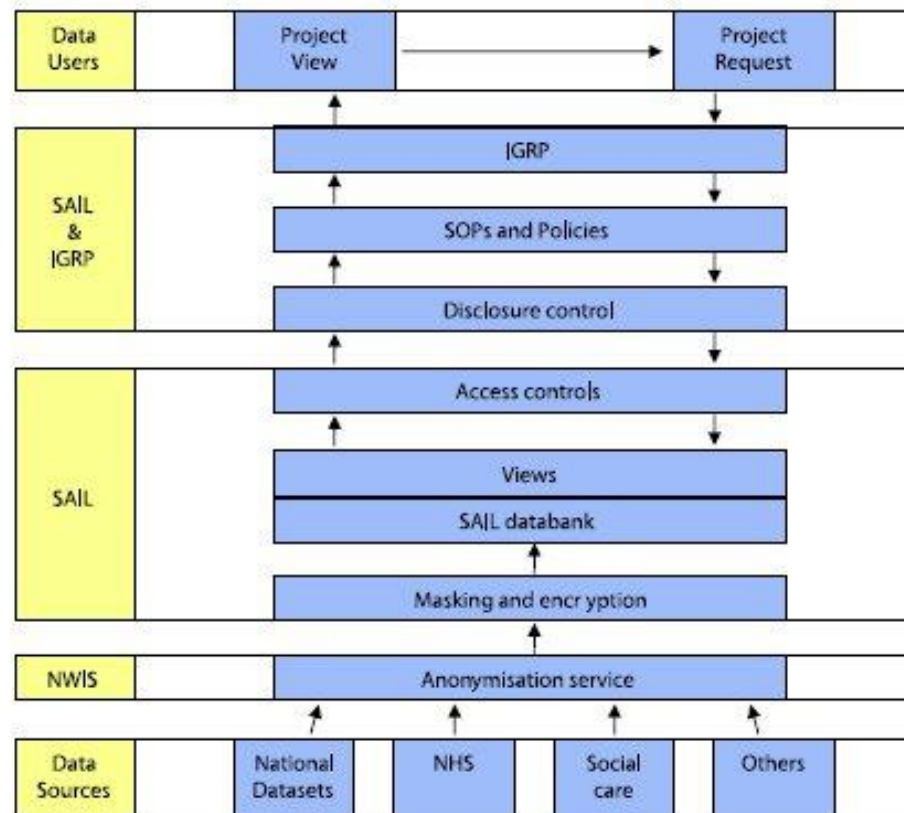
journal homepage: [www.elsevier.com/locate/yjbin](http://www.elsevier.com/locate/yjbin)



### A case study of the Secure Anonymous Information Linkage (SAIL) Gateway: A privacy-protecting remote access system for health-related research and evaluation ☆

Kerina H. Jones\*, David V. Ford, Chris Jones, Rohan Dsilva, Simon Thompson, Caroline J. Brool Martin L. Heaven, Daniel S. Thayer, Cynthia L. McNerney, Ronan A. Lyons

College of Medicine, ILS2, Swansea University, Swansea, Wales SA2 8PP, UK



**Fig. 1.** SAIL architecture. This diagram shows the SAIL databank system and the controls in place for data acquisition and utilisation, with an indication of the roles carried out by each party. Beginning at the base of the diagram, SAIL has formal agreements with data providers to provide their data to the databank in accordance with Information Governance. The commonly-recognised identifiers are anonymised at NWIS, who provide a trusted third party service to SAIL. Further processes of masking and encryption are carried out at SAIL, and the SAIL databank is constructed. From the top of the diagram, requests to use the data are reviewed by SAIL and an independent Information Governance Review Panel (IGRP) to assess compliance with Information Governance before access can be allowed. Once this is agreed, a data view is created by SAIL staff, and access to this view can be made available via the SAIL Gateway. For this to happen, further data transformations are carried out to control the risk of disclosure, and the data user signs an access agreement for responsible data utilisation, in accordance the specifications of the IGRP to comply with Information Governance.

The screenshot shows the SAIL External Info Central interface for user Toby Lerone. It includes a profile section with a photo placeholder, contact information (Organisation: Swansea University, Job Title: Researcher, Email: SAIL.Databank@swansea.ac.uk, Office Tel: 01792 606511), and a list of services (Access SAIL Gateway, Access SAIL Gateway (old system), Access Approved Files). A 'My Timeline' section shows recent activity: 'Toby Lerone's membership with project 0000 has been edited.' and 'The user Toby Lerone's membership of project 0000 with role SAILAccess is due to expire in 24 hours.' A 'Service Status' section lists various services like NWIS Switching Service, HIRU Switching Service, SAIL Gateway, FTP Services, SAIL Database, and Data Mining.

# Elementi essenziali della governance dei dati

<http://www.oecd.org/els/health-systems/Item-1-Access-to-data-and-privacy-Jillian-Oderkirk-OECD.pdf>

Data governance framework is aligned to maximise benefits and minimise risks:

1. Health information system
2. Legal framework
3. Public communication plan
4. Certification or accreditation of processors
5. Project approval process
6. Data de-identification steps
7. Data security and management
8. Data governance review cycle

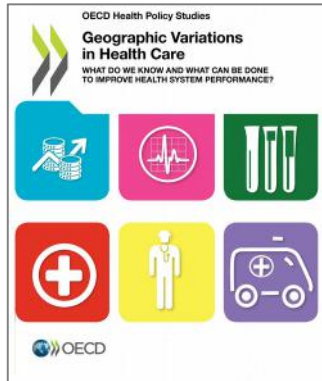
Benefits and risks of proposed data uses are evaluated:

Benefits: Rights to health, Societal values toward health, health care quality & efficiency, and scientific discovery & innovation

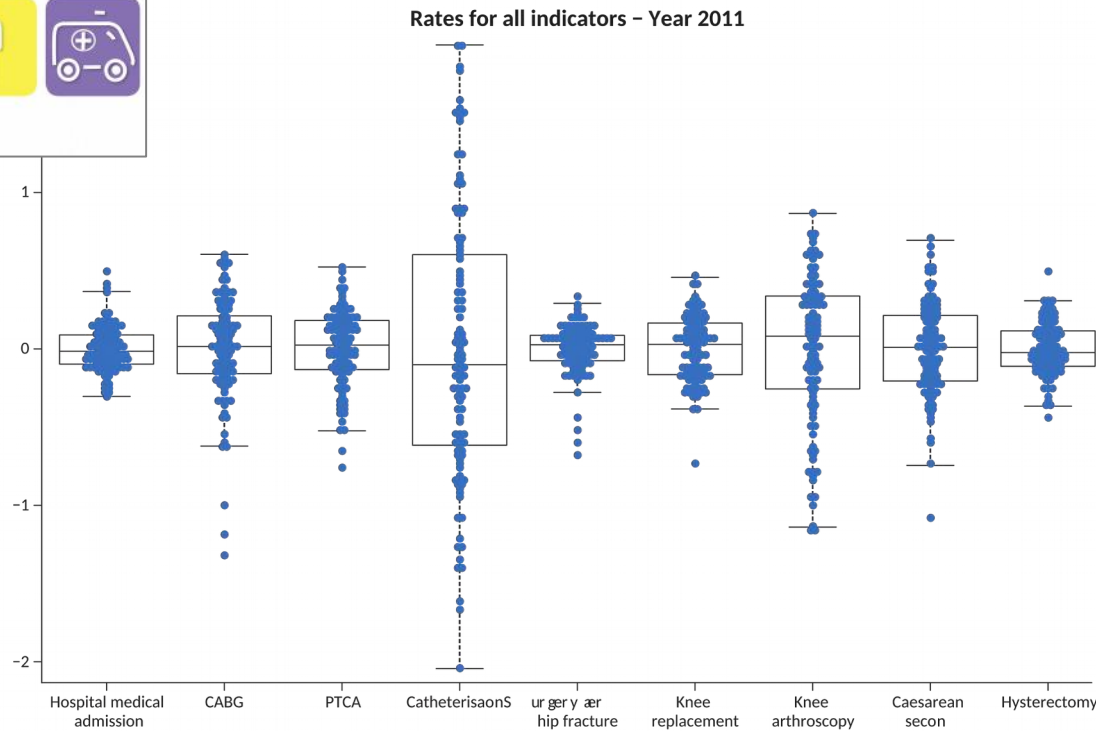
Risks: Rights to privacy, Societal trust in government & institutions, Societal values toward privacy & sharing data

Informed decisions to process personal health data are taken

# Rapporti sulla variabilità della pratica clinica



Turnip charts of log-standardised rates for all health care procedures and activities, by province, Italy, 2011

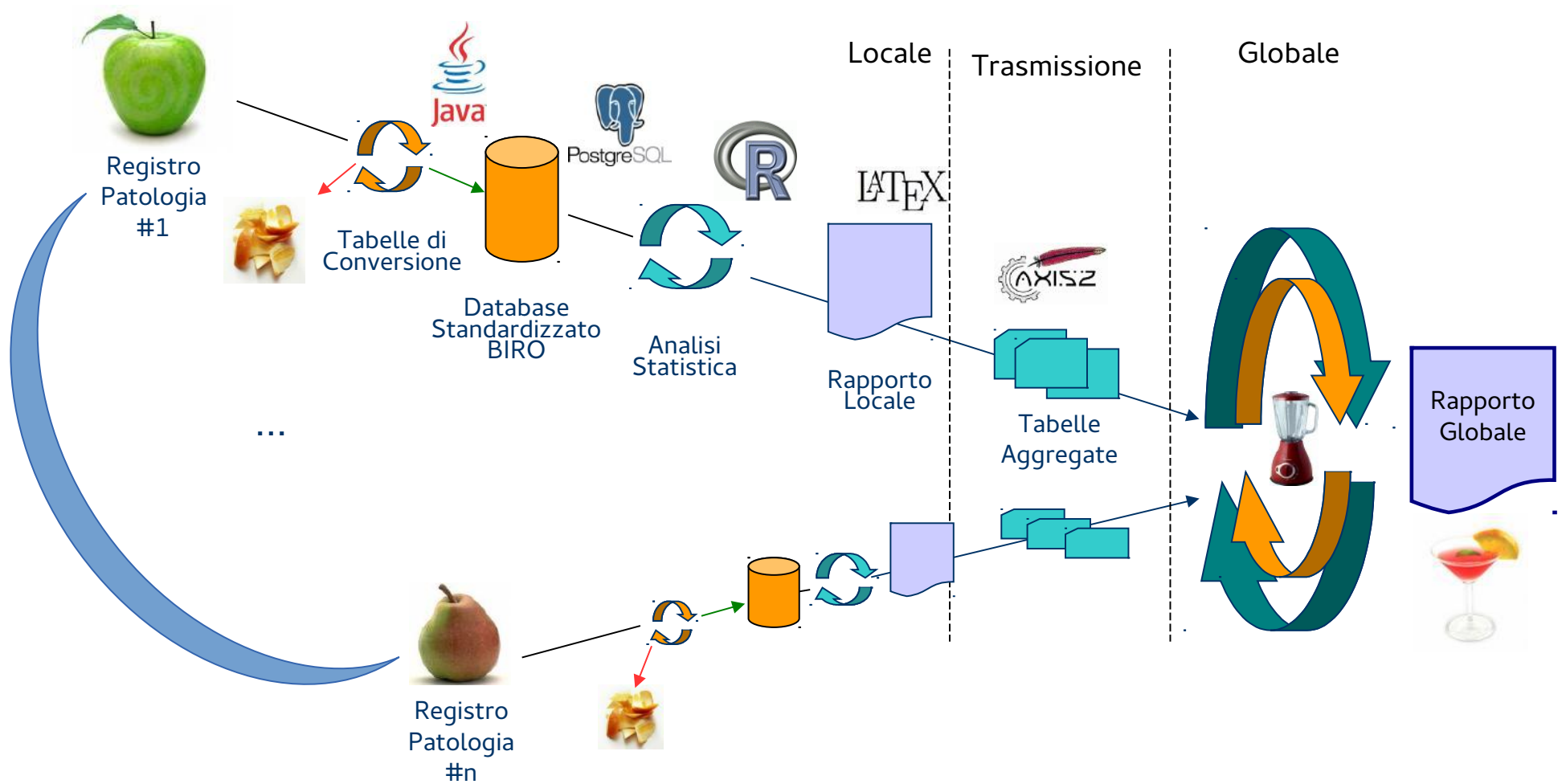


Source: Authors' estimates based on National Hospital Discharges Database, Ufficio VI, DG Programmazione sanitaria, Ministero della Salute, Italy.



# Il sistema BIRO

<http://www.eubirod.eu>





# Argomenti

1. Perché valutare la Performance dei sistemi sanitari?
2. Perché c'è bisogno delle Scienze Statistiche?
3. Che sfide si aprono con i "Big Data"?
4. Quale futuro per le Statistiche della Salute?

# Triplo scopo ("Triple Aim")

**QUALITA'  
DELLA  
CURA**

**SALUTE**

**COSTI**



### CREATE INTEGRATED PRACTICE UNITS (IPUs)

Organize care around patient medical conditions and distinct patient segments.



### MEASURE OUTCOMES

Measure health outcomes for every patient.



### MEASURE COSTS

Measure the actual costs of patient care.



### BUNDLED PRICES

Reimburse the full care cycle for medical conditions.



### SYSTEMS INTEGRATION

Clinically integrate care across separate units and facilities using an IPU structure.



### GEOGRAPHIC EXPANSION

Increase the geographic reach of leading providers in their areas of excellence.



### BUILD AN ENABLING INFORMATION TECHNOLOGY PLATFORM

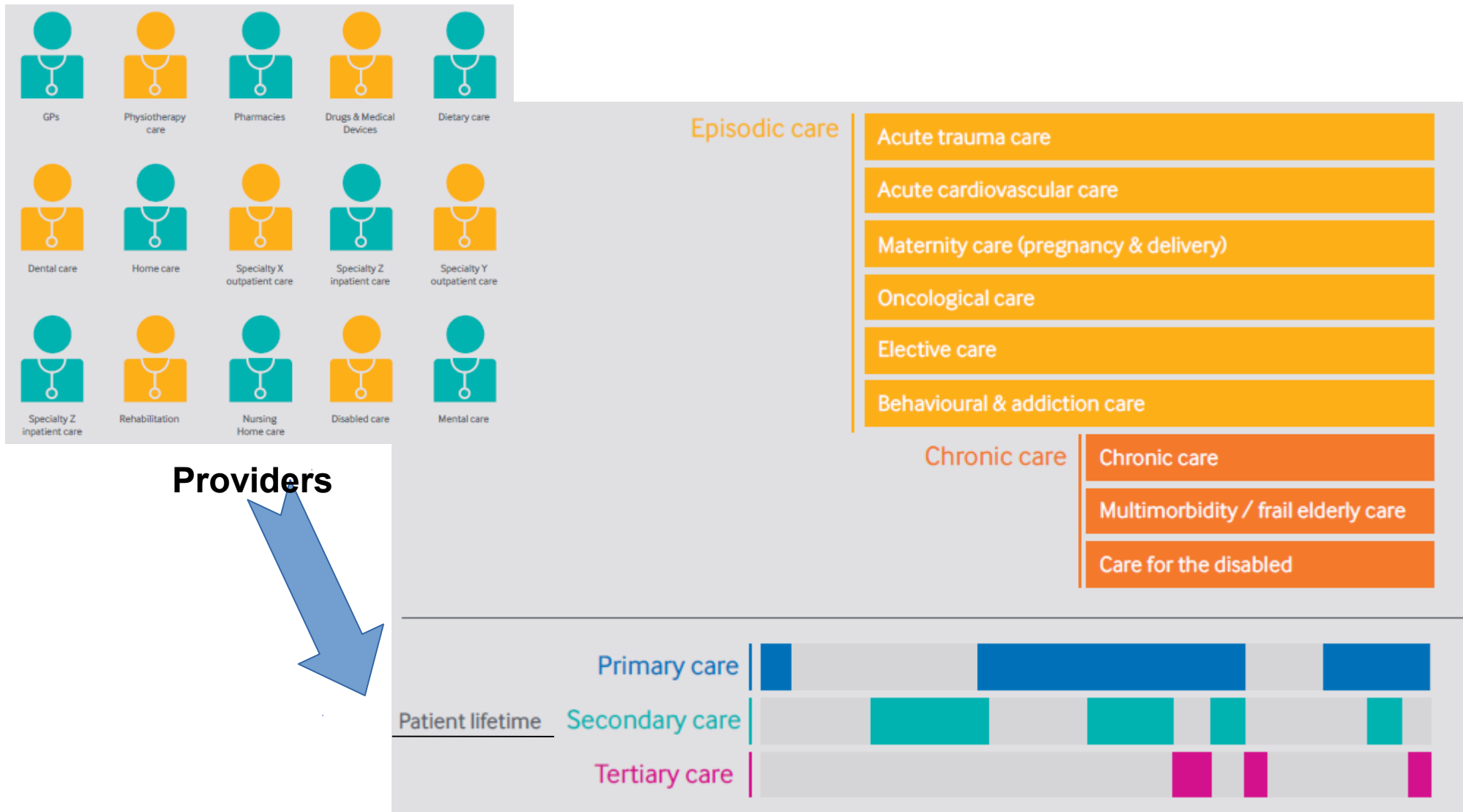
Use information technology to help restructure care delivery and accurately measure results.



# Value-Based Health Care Delivery

<http://www.isc.hbs.edu/health-care/vbhcd/Pages/default.aspx>

# Person-centred care



# Il futuro delle statistiche sanitarie

- Patient-Reported Outcome Measures” (PROMs)
  - Misurano le percezioni dei pazienti sul loro stato di salute, esiti clinici, mobilità e qualità della vita. Esempi: qual'era il livello di mobilità di un paziente prima della frattura del femore, ed è migliorato dopo l'intervento? La condizione del paziente lo limita nel fare attività quali corsa, sci o bicicletta?
- Patient-Reported Experience Measures (PREMs)
  - Misurano le percezioni dei pazienti sulla loro esperienza di cura, focalizzandosi sui processi di cura e sull'impatto che hanno sull'esperienza dei pazienti. Esempio: il paziente ha dovuto aspettare molto per un trattamento? Si è sentito coinvolto nelle decisioni cliniche?
- “Patient Activation Measures” (PAMs)
  - Misurano fino a che punto i pazienti si attivano nel migliorare e mantenere la loro salute attraverso il self-management
- “Patient-Reported Incident Measures” (PRIMs)
  - Misurano gli incidenti riportati dai pazienti su aspetti di sicurezza

# Conclusioni: può la statistica influenzare (e migliorare) le politiche sociali?

- Limitatamente – se si occupa solo di numeri
  - Moderatamente – se si occupa anche di metodi e sistemi
  - In maniera determinante – se si occupa anche di:
    - Qualità
    - Valori
    - Equità
    - Persone
    - Fenomeni, politiche e decisioni
- ...contribuendo alla pari in gruppi multidisciplinari

# Evidence-based public policy?

*“There is nothing a government hates more than to be well-informed: for it makes the process of arriving at decisions much more complicated and difficult.”*

John Maynard Keynes

The Times (March 11, 1937); Collected Writings, vol. 21, p. 409