Agència de Qualitat i Avaluació Sanitàries de Catalunya

Generalitat de Catalunya
Departament de Salut

Addressing challenges to open science: Data sharing, replication, and robustness of evidence from real world data

The case of Catalonia

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ISPOR. Barcelona, November 14th

Overview and key figures of the Catalan healthcare system

- **National Health Service**
- Universal coverage and free at the point of use
- Funded by taxes
- Spending 9.1% of Catalan GDP
- Multi-provider system
- Relationship between Catalan Health Service (public insurance) and providers contractually full accounted (health objectives, activity, economic amount, rate (pricing), invoicing system, evaluation system). Providers have the **duty to share information** with both CatSalut and other providers
- Population: 7.500.000
- Life expectancy: 82,40 years
- Infant mortality rate: 2,83 / 1.000

Overview and key figures of the Catalan healthcare system

- **46 million** primary care visits per year
- **760.000** hospital discharges per year
- **60 million** electronic health record documents
- **100.000** convalescence discharges per year
- **2.7 million** visits to emergency units
- **140 million** electronic prescriptions per year

How healthcare IT landscape is organized

- 95% of primary care centers use the same IT system (eCAP)
- Hospital IT systems diversity is much greater
- Since 2005 **Shared Electronic Health Record** (HC3) project. Created to share information between the different IT systems, 100% of primary care centers and hospitals connected to it
- Currently sharing **60 million documents, both structured and semi structured** data:
  - Diagnosis
  - Clinical Procedures
  - Lab tests
  - Medical image (100% digitalized) and non medical image
  - Drug prescription (100% digitalized)
  - Reports of discharges (mainly PDF documents)
  - Etc.

How healthcare IT landscape is organized

- Universal healthcare card **with unique personal identifier**, operating since 2002
- It has to be used in **all health contacts**
- This allows us to easily **link** all datasets

4 Areas of application of health information

Clinical practice

- Improved diagnostic decisions
- Better coordination between healthcare levels

Healthcare planning

- More capacity for planning and resource allocation
- Planning of resources according to the needs of the population
- Improved healthcare quality, effectiveness and efficiency
- Promoting transparency, accountability and open data

Self-care

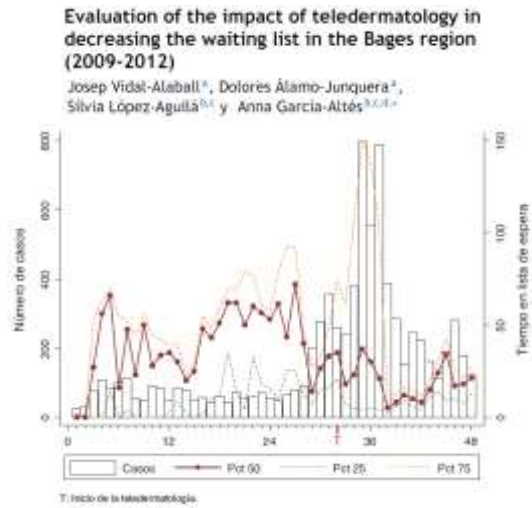
- Access to the personal health folder (which includes the medication plan, vaccinations, results of medical tests) promotes self-care and improves quality of life

Research

- Improved research quality, at lower cost and shorter times
- Increased capacity to obtain competitive funds
- Acceleration of innovation
- Attraction of talent, generation of economic activity and job creation

Clinical practice

- Improved diagnostic decisions
- Better coordination between healthcare levels



Clinical practice

- Improved diagnostic decisions
- Better coordination between healthcare levels

What is the impact of anticoagulants consumption in the intracranial hemorrhage hospitalization rate?

- Currently in Catalonia there are 140,000 people taking anticoagulants
- In the last 7 years has not observed an increase in the intracranial hemorrhage hospitalization rate

- To do this study with traditional methods, it would take around 10 years
- Through the registers and information systems available in Catalonia, and relating and analyzing this information, it is possible to solve this research question in less than a years

Healthcare planning

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Population 7.695.503 | Groupers | Classification | Stratification | ID

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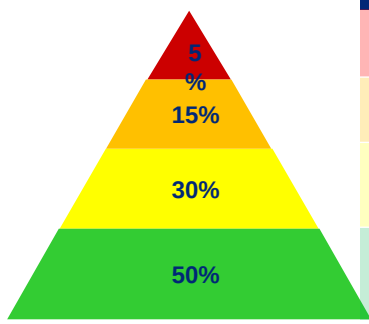

% population	Mortality rate (per 100)	Mean PC visits	Emergency hospitalizations rate (per 100)	Mean number of drugs used
5%	12,3	22,8	59,7	13,4
15%	1,1	12,8	6,7	8,0
30%	0,1	6,7	2,4	3,6
50%	0,1	1,8	0,5	0,9

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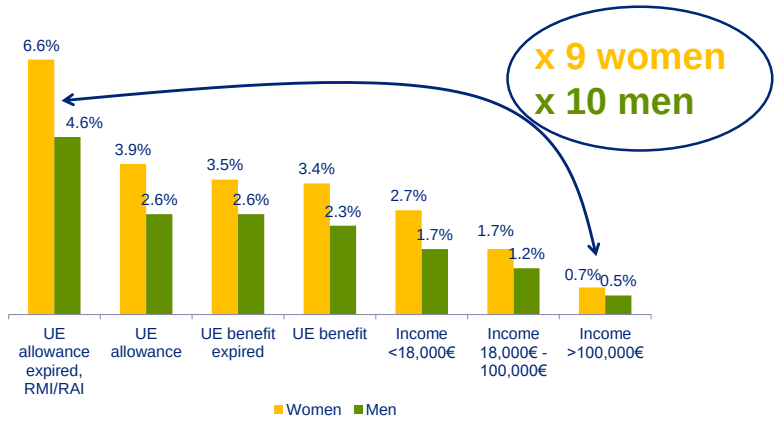

% People attended at mental health centres. Catalonia, 2015

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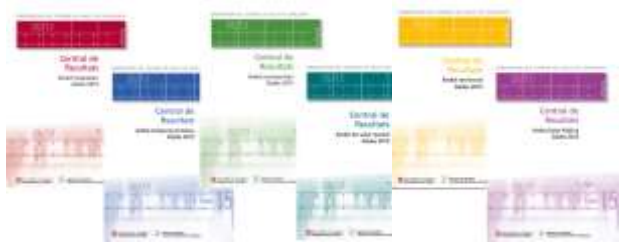

Since 2012: hospitals, primary care, long-term care, mental health care, public health, territory, emergencies, advanced health training

60 outcomes indicators per topic

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Nivell hospital	Unitat Proveïdora	Ingressos urgents (%)	Urgències ingressades (%)	Cesàries (%)	Pneumònies sense complicacions (%)	Nadons amb gran prematuritat (%)	Temps entrada sala-bolà (mitjana en minuts)	Pacients en codi infart atesos en menys de 120 minuts (ECG-bolà)	Temps porta-agulla en trombòlisi intrav. per IAMEST (mediana en min) IC 95%
1	Hospital Universitari de Bellvitge	54,2	16,0		9,0		24	55,7	51(41-80)
	H. U. Germans Trias i Pujol de Badalona	63,2						75,7	37(32-60)
	Hospital Clínic	55,8						73,7	40(31-50)
	Hospital de la Santa Creu i Sant Pau	74,5						62,2	36(30-45)
	Hospital Universitari Vall d'Hebron	67,2	14,3	27,1	11,6	6,74	27	58,6	46(31-75)
2	Hospital U. Arnau de Vilanova de Lleida	74,5	16,9	20,1	11,1	1,70	27	59,6	57(41-63)
	Hospital Univ. Joan XXIII de Tarragona	71,9	12,2	26,4	17,0	4,22	31	59,0	55(46-72)
	Hospital U Doctor Josep Trueta de Girona	70,1	17,1	22,4	15,1	5,81	15	56,3	50(39-69)
	Hospital Mútua de Terrassa	61,9	6,8	21,8	13,0	0,94	20	67,0	57(27-52)
	Hospital de Sabadell	69,7	12,9	19,7					
	Hospital del Mar (Parc Salut Mar)	63,3	10,2	22,8					
	Hospital Universitari Sagrat Cor								
	Hospital General de Catalunya			38,3					
3	Hospital Verge de la Cinta			30,0					
	Centre Hospitalari (Althaia)	75,5	13,5	17,8					
	Hospital Dos de Maig (Barcelona)	62,6	3,3						
	Hospital de Terrassa	72,1	5,8	14,4					
	Hospital General de Vic			10,5					
	Hospital General de Granollers			22,4	7,8	1,33			48(32-68)
	Fundació Hospital Residència			10,3	6,5	0,00			55(54-64)
	Hospital Universitari Sant Joan			10,2	13,4	1,24			
	Hospital d'Igualada del CSA			16,3	9,9	0,21			60(43-80)
	Hospital de Mataró	77,5	10,7	21,2	11,0	0,49			50(39-58)
	CSI H. de l'Hospitalet-H. Moisès Broggi	73,2	14,0	16,4	6,9	0,13			69(46-92)

Deanonymized indicators for all public providers

Indicators adjusted by age, sex and risk

Expert committee
Scientific societies
Professionals

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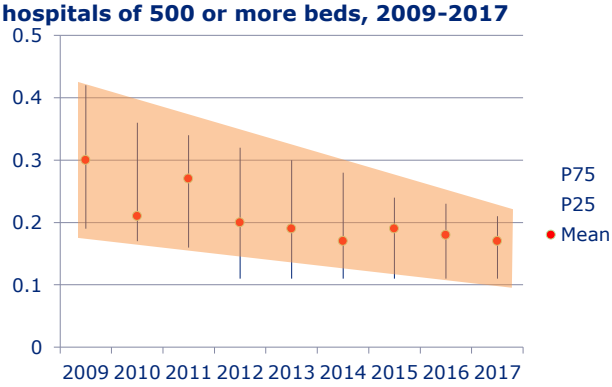
Incidence of central venous line bacteremia in hospitals of 500 or more beds, 2009-2017



Hospital mortality, mean length of stay, satisfaccion, c-sections, etc.

Incidence = Number of bacteremia by year × 1.000) / length of stay

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Evaluation of the concentration of digestive oncology surgery

Background:

- Variability of results observed in a audit of rectal cancer of the period 2005-2007
- Monitoring of intrahospital mortality of complex surgical procedures in cancer from 2005 to 2012
- Dispersion of the activity
- Evidence about the relationship between volume and results

Intervention:

- Centralization of complex procedures in an orderly manner
- Identification of esophageal, pancreatic, liver and rectal metastases (among others) as areas of high specialization, following the criteria of volume of cases and procedures that require a high level of expertise
- The 21/2012 instruction of CatSalut came into effect in January 2012

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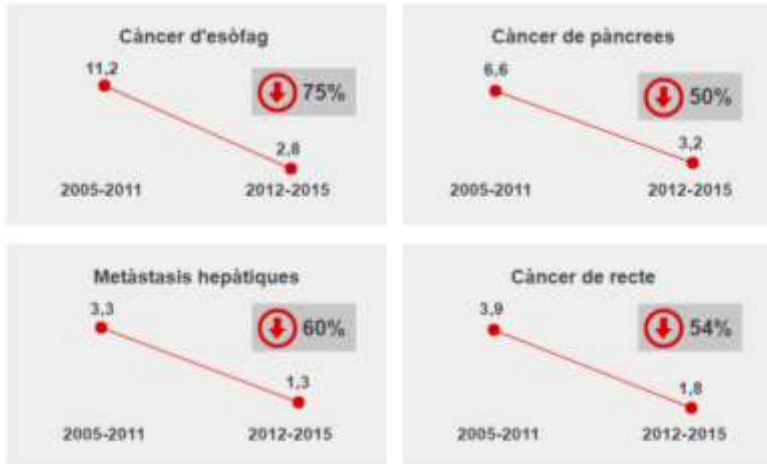
30-day mortality rate



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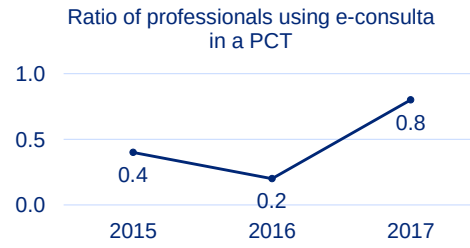

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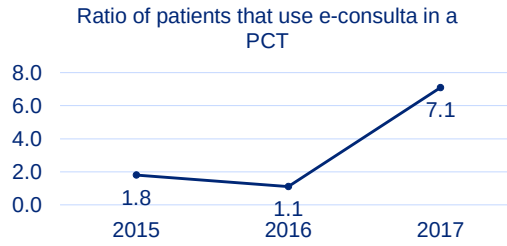

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Exposure to medicines among patients admitted for hip fracture and the case-fatality rate at 1 year. A longitudinal study

Eur J Clin Pharmacol. 2012 Nov;68(11):1525-31. doi: 10.1007/s00228-012-1273-y. Epub 2012 Apr 15.

Exposure to medicines among patients admitted for hip fracture and the case-fatality rate at 1 year: a longitudinal study.

Agustí A[1], Paisés E, Cunyat A, Ballarín E, Vidal X, Teixidor J, Tomás J, Villar MM, Laporte JR.

Author information

Abstract

PURPOSE: To describe the demographic and clinical characteristics and the pre-fracture exposure to medicines of patients admitted for a hip fracture, and to explore their association with fatal outcome 1 year after the fracture.

METHODS: All patients ≥ 65 years old admitted for a hip fracture in a tertiary hospital in Barcelona between January 1 and December 31 2007 were included. Data on the patients' clinical characteristics before and during hospital admission and on pre-fracture exposures to medicines were collected from the clinical records. One-year mortality was checked by approaching the patients and their families and was cross-checked with the national mortality statistics database. A Cox proportional hazards analysis was carried out.

RESULTS: Four hundred and fifty-six patients [mean age (SD) 82.9 (7.2) years, 73.5 % female], were admitted with hip fracture during the study period. Almost 80 % of the patients (363, 79.6 %) had three or more associated conditions, and 41.7 % received pre-fracture treatment with five or more drugs. The case-fatality rate during hospital admission was 4.6 % (21 patients). One hundred and seven patients died within 1 year (23.5 %). Advanced age, male gender, two or more associated chronic conditions, cancer, severe cognitive impairment, and treatment with opiates before fracture were significantly associated with the risk of dying. An inverse association was recorded between mortality and pre-hospital exposure to medicines for osteoporosis.

CONCLUSIONS: One-quarter of patients admitted for hip fracture died within 1 year after the fracture. Exposure to opiates before hip fracture was associated with an increased 1-year death rate, whereas treatment with drugs for osteoporosis was associated with a decrease in death rate. These results should be confirmed in studies with detailed prospective collection of information on exposure to medicines.

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- The study **"*Hip fracture in population older than 65 years*"** has been published as part of the annual report of the Results Center ("Central de Resultats"). Study carried out reusing information
- Exposure to medicines among patients admitted for hip fracture and the case-fatality rate at 1 year
- **Sample**: **8.172** patients 65 years or older admitted for hip fracture
- **Sources of information**: pharmaceutical information, hospital discharge records, mortality data, etc.
  Information anonymized by AQuAS
- The **one year mortality rate** was **24,5%** (CI amplitude: 1,9%)

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Exposure to medicines among patients admitted for hip fracture and th… study.

Information access	▪ From **electronic health record** with patients' informed consent. Difficult to ensure the **principle of proportionality** of the information.	▪ **Anonymized** information coming from administrative registers**. Principle of proportionality of information** is ensured.
Sample size	▪ 456 patients	▪ 8.172 patients
Mortality rate	▪ 24,6% with a confidence interval 20,6% to 28,6% (CI amplitude: **7,9%**)	▪ 24,5% with a confidence interval 23,6% to 25,5% (CI amplitude: **1,9%**)
Time to carry out the study	▪ More than 2 years	▪ Few weeks/ months
Time to replicate the study	▪ Repeat the study from the beginning	

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PADRIS
informació al servei de la salut de les persones

- AQuAS: Institutional leadership, overall strategy
- Public healthcare centers, public universities, CERCA centers
- Code of ethics (respect to people, justice, efficiency, transparency, responsible research)
- Management of data security and legal issues

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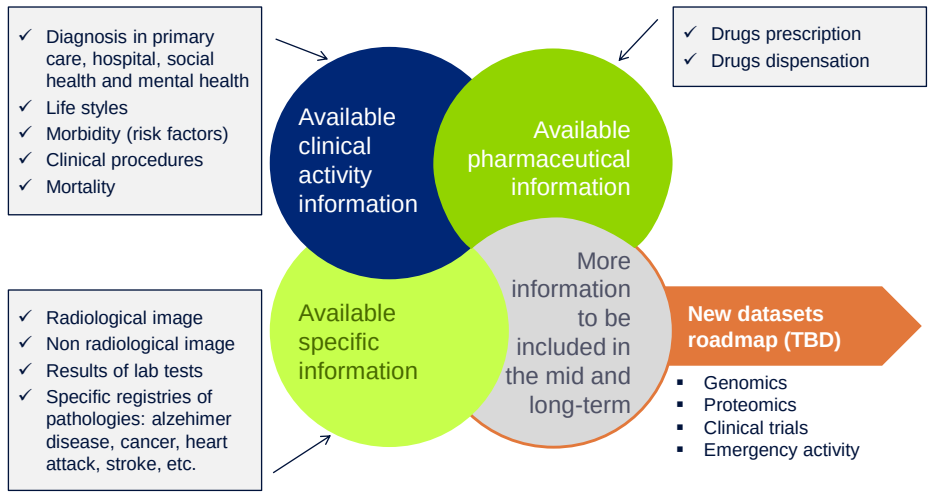

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