



XUNTA DE GALICIA  
CONSELLERÍA DE SANIDADE



# DLA Seminar

March 3rd, 2011

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Head of Service of IT Support & Deployment  
Regional Health Service - Regional Ministry  
of Health

Galicia - Spain



XUNTA DE GALICIA  
CONSELLERÍA DE SANIDADE

# Agenda

- Who are we?
- Healthcare and ICT at Galician Health Service
- Electronic Health Record (EHR): Engine at work
  - e-Prescription
  - Digital imaging
- Driving healthcare with BI tools
- Innovation: our challenge

# Who are we?

- In Spain, we have some rights related to health guaranteed by law:
  - Protection of health (for Spanish citizens and foreign residents)
  - Every Spanish citizen and foreign residents have free access to the National Health System (NHS):
    - Individuals pay contributions according to their economic capacity and receive all kinds of health services, simply, in accordance with their health needs.
  - Health is one of the pillars of the Welfare State in Spain
- The National Health System is managed regionally, in each of the 17 *autonomous* regions of Spain
  - Galicia is one of them
  - Information Systems Policies are different in each region, although we are finishing projects to interoperate all of them at Spanish (and European) level.

# Who are we?

- In Galicia we have some particularities that make Health management a bit more difficult, specially in the field of ICT:
  - Widespread population: very scattered all along the territory.
    - 2.797.653 people distributed in 30.000 population entities
    - Galicia has a total area of 29.574,4 km<sup>2</sup>
    - Population density is low: 94,5(people per km<sup>2</sup>)

<b><i>Population</i></b>	<b><i># of Entities</i></b>
< 100	<b>26948</b>
101 to 500	<b>2736</b>
501 to 1.000	<b>213</b>
1.001 to 2.000	<b>91</b>
2.001 to 5.000	<b>67</b>
5.001 to 10.000	<b>24</b>
10.001 to 20.000	<b>12</b>
20.001 to 50.000	<b>0</b>
50.001 to 100.000	<b>5</b>
100.001 to 500.000	<b>2</b>
> 500.000	<b>0</b>

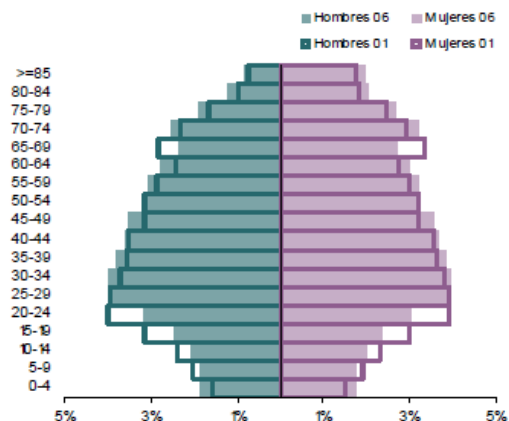




# Who are we?

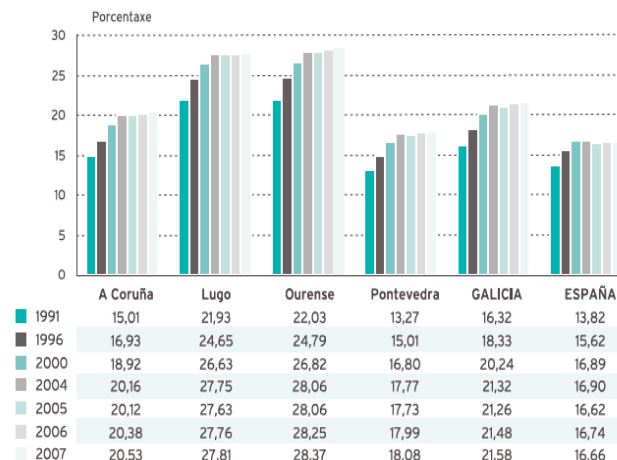
- More particularities:
  - Population's average age is very high (one of the highest in Europe).
  - People over 65 (retirement age in Spain):
    - Spain 2010: 17%
    - Galicia 2010: 22 %

Comparación de las pirámides de población de los años 2001 y 2006. Galicia



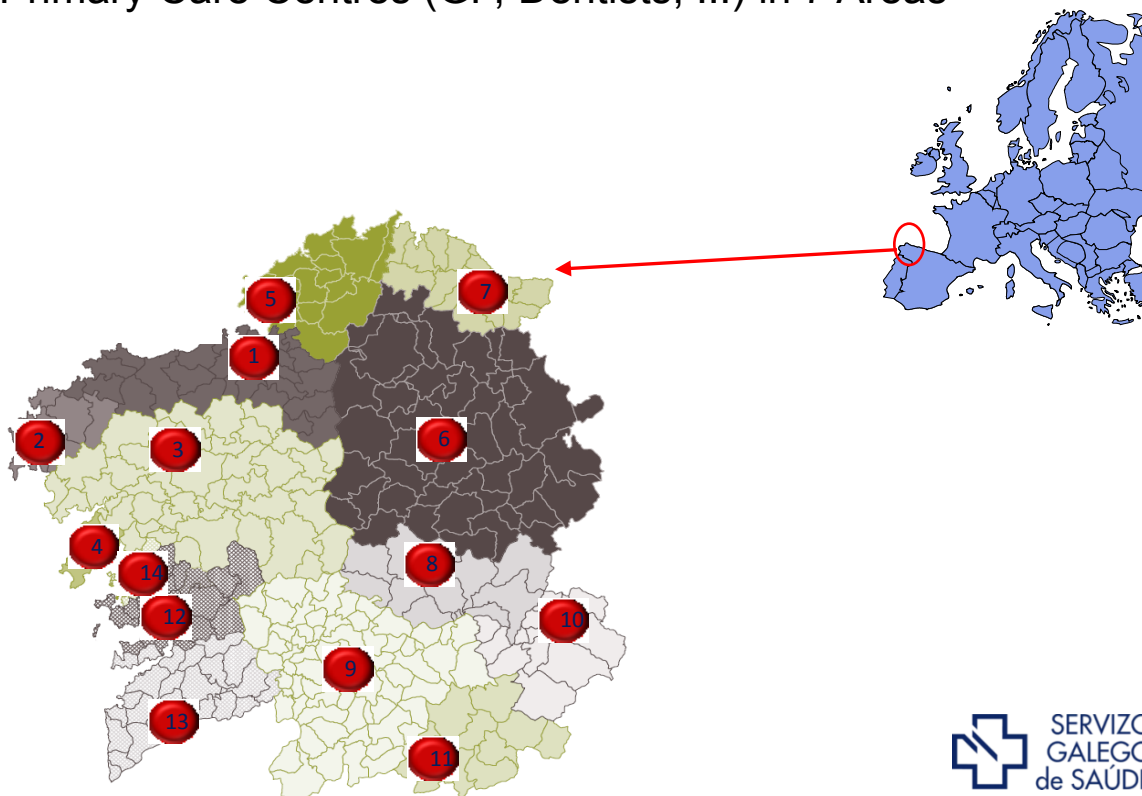
Fuente: INE. Padrón municipal de habitantes

Poboación de 65 e máis anos. Distribución por provincias 1991-2007 Figura 1.2



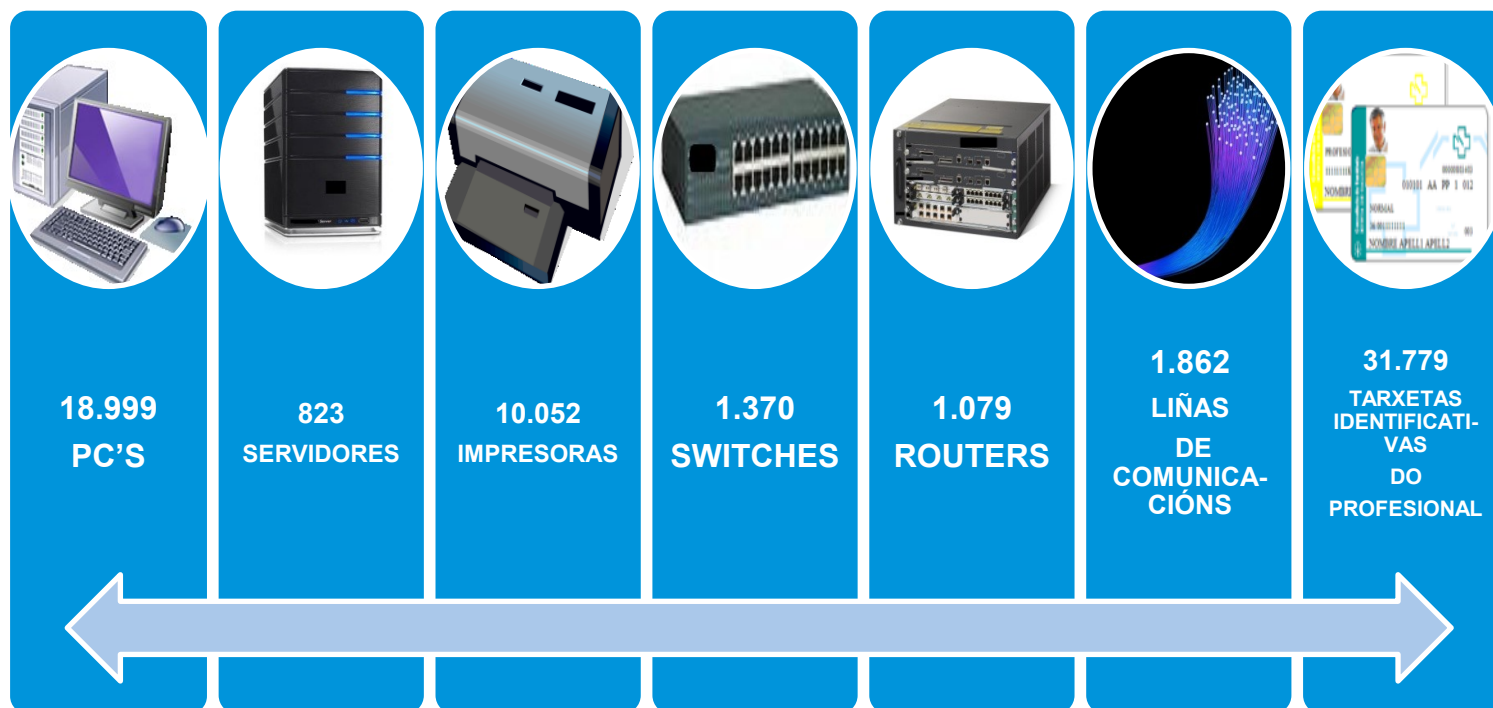
# Who are we?

- Galician Health Service is “Servizo Galego de Saude” ([www.sergas.es](http://www.sergas.es))
- To provide Health Services, Galician Health Service has:
  - 14 Secondary Care Trusts & Hospitals
  - 479 “health centres” - Primary Care Centres (GP, Dentists, ...) in 7 Areas
  - 8.893 doctors
  - 10.433 nurses



# Who are we?

- We store the electronic health records (EHR) of 2.789.920 citizens.
  - 1.025 TB, 130 of which are clinical images (X-ray, ultrasound scan...)
- We try to help with our ICT infrastructure:





# Where do we come from?

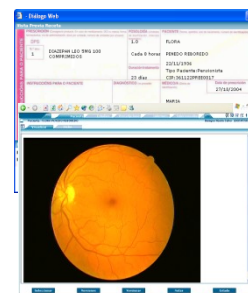
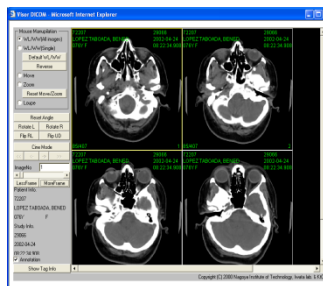
- The ICT in the field of Health have evolved very slowly



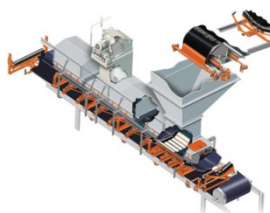
# Some remarks about clinical environment

## “Classical” ways of storing Health Records

- Huge data stores including different data supports



- Very low “transfer rates”



- Its traceability is not so good.



# Some remarks about clinical environment

## “Classical” ways of storing Health Records

- Are very uncomfortable for all the stakeholders

- Professionals



- Patients



# Some remarks about clinical environment

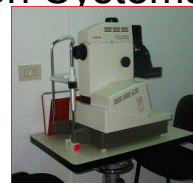
## We are now evolving quite fast...

- We have no other raw material than information. And the only product is knowledge. This knowledge, properly stored, transmitted and processed is the base of clinical practise. ICT are unbeatable in security, speed and efficiency matters. Our health service is now:

- Reducing costs in and trough technology



- Need to integrate new devices and Information Systems



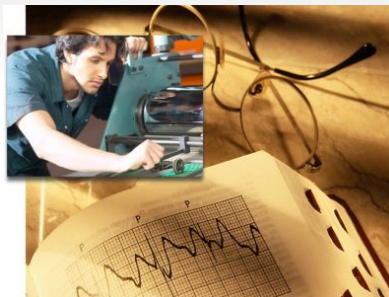
- ... i.e. We offer the possibility of speeding up and easing Health processes



# Some remarks about clinical environment

## Obstacles in the way.

- Technical matters
- Organisational requirements
- Economical issues
- Legal obligations



# Some remarks about clinical environment

## Knowing our users

- Large number of qualified professionals
- We are changing their working environment
- We should cope with a regulatory framework about personal data, from the beginning of change process





# Who am I?

- I'm the head of service of ICT Support & Deployment. In our service we have responsibilities over:
  - ICT user's Help Desk
    - Almost every clinical centre supported with ICT infrastructure.
    - More than 59.000 ICT users
    - Over 350.000 ICT requests recorded per year
  - ICT Change Management
  - ICT Quality (ISO 20000 & ITIL)
  - ICT & Information Security (ISO 27000 and Data Protection)

# Galician Health Service IT status.

## IT Health Project

	2006	2007	2008	2009	2010
Total SERGAS Budget	3.174 M€	3.388 M€	3.638 M€	3.788 M€	3.728,3 M€
SERGAS IT Investment	30,34 M€	35,11 M€	39,48 M€	41,38 M€	38,50 M€

- 101 ongoing IT projects in 2010
- 51 IT companies involved
- Activity:
  - More than 200 internal applications and programs
  - User's call center:
    - Above 95% attended
    - Above 97% solved.

In the last 4 years, we could see a huge progress:  
In 2006, it was the 45% of our professionals who used computers in their daily work. In 2010 this number has raised up to 90%.  
70% GP has chosen IT as the more effective action to improve their activity in a recent survey.



# Strategic plan “SERGAS 2014”

## Strategic Objectives

Improvement in demand and healthcare provision

Security and Quality in healthcare

Professionals: a critical resource

Technology and Information

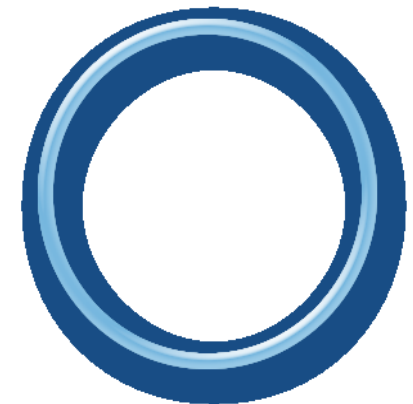
The healthcare sector as economic engine

Efficient management for Sustainability

Infrastructure modernization

The strategic plan SERGAS 2014 establishes the roadmap for the **transformation** and **modernization** in Galician healthcare for the next four years....

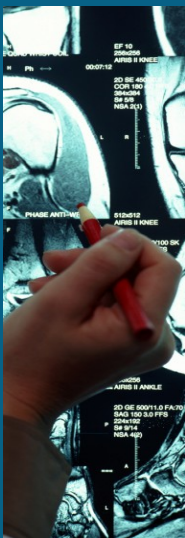
..... Defines **7 strategic objectives** and **40** execution lines



# Objective 4: Technology and Information

## Objective 4

Development of the Galician Health Information System to ease clinical practice and enhance decision making



deployment of **Electronic Health Record** and **ePrescription** on all Health Centers

**100% citizens and professionals**

digital services for professionals and citizens

Tools that allow Efficiency, Quality and Capability

balanced scorecard

Information Systems must provide **integrated information for efficient management**

security is a must

**Integrity, Reliability and personal data Privacy** must be provided and guaranteed

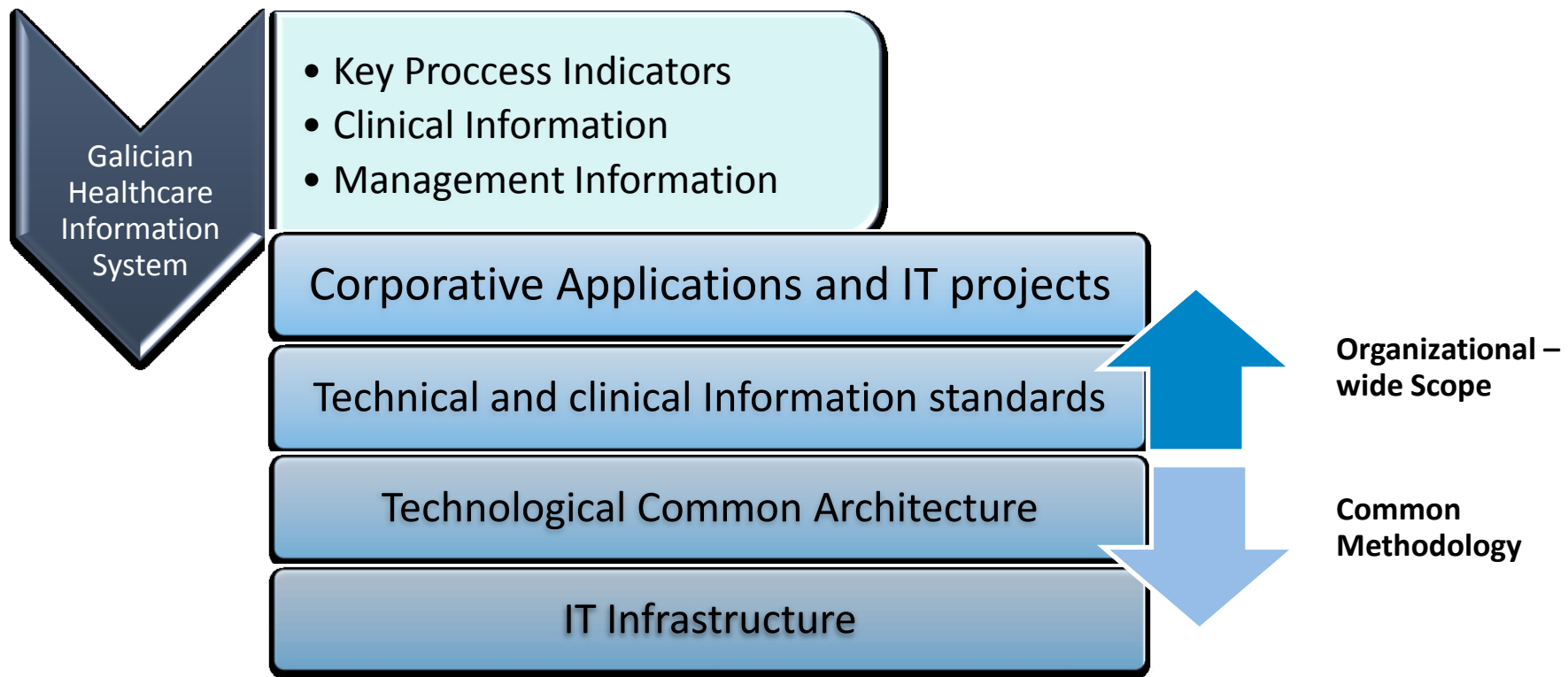


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# IT Strategy in the Galician Health Service

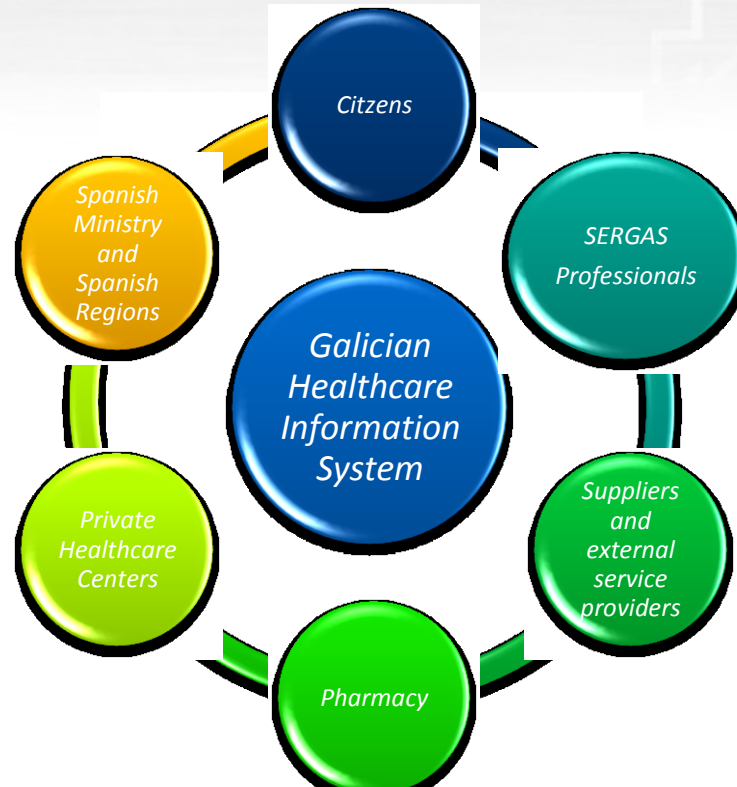
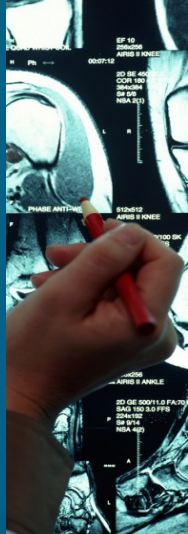
*The Galician Healthcare Information System integrates in both functional and technological areas all different subsystems which support healthcare and administrative processes carried out in the Galician Health Service.*



# Healthcare IT Network

## Objective 4

Development of the Galician Health Information System to ease clinical practice and enhance decision making





# Main Initiatives

The IT strategy is deployed through several projects



IANUS: Electronic Health Record

ePrescription

Speech Recognition

Digital imaging

Business Intelligence Platform

Research and Innovation

Professional and Citizen Services

# IANUS: The Galician EHR

- IANUS<sup>®</sup> System has been designed at the Galician Health Service.
- IANUS is the streamline of all clinical information systems at SERGAS.
- It allows clinical data generation and also integrates all available information in departamental systems.
- All professionals share the same tool and all information about the patient is available online from any center.



# IANUS means Unified EHR System

- **Clinical Information**

- Diagnostic procedure reports
- Digital Imaging
- (In) patients e-Prescription
- Nursery care actions
- Rehabilitation
- Legacy Reporting Systems.
- Screening programs
- Vaccines register & planning
- Medical problems
- Episodes
- Allergies
- Ambulatory e-Prescription
- Odontology
- Radiology and Pathology
- Laboratory results
- Ordering Lab, Radio and Pathology

- **Administrative Information**

- Patient Identity and data
- Register for labour illness
- Sanitary Transport Requests
- Hospital visits and Episodes
- Anticipatory Procedure Exception Requests

**Global MPI**



**Common Modules**

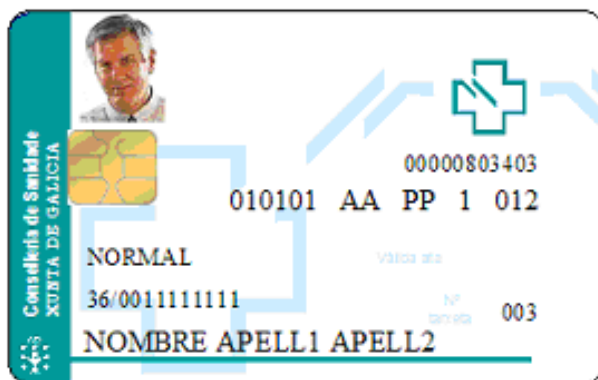
**Primary care**

**Secondary care**



# Information Security

- IANUS requires double system for user authentication based on Digital Certificates for access control & login / password combination.
- Information and actions on the EHR are available according to user roles.
- All information registered on the EHR is signed digitally, so non-repudiation and integrity of clinical information is guaranteed.
- According to Spanish Data Protection Law, every access to health information (high privacy level) is registered.
- Most of our professionals have been provided with smart cards and digital certificates



# Professionals accessing IANUS

- IANUS makes clinical information available to 28.000 healthcare professionals

- **Secondary Care**

- 14 Hospitais - 14.000 professionals
  - 90% of Clinicians
  - 70% of Nursery and other health professionals



- **Primary Care**

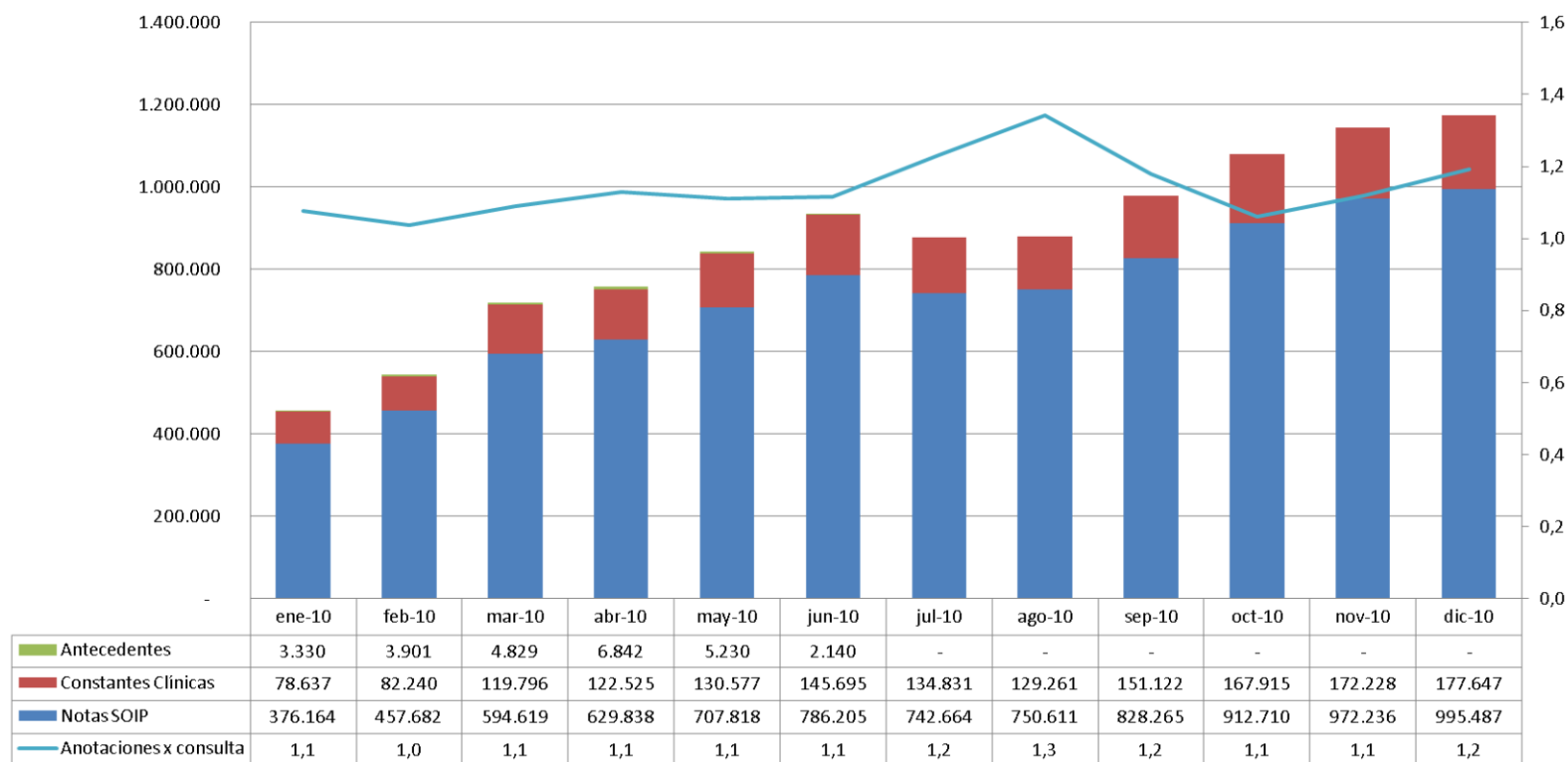
- 457 Primary Care Centers – More than 6.000 professionals
  - 96% of Clinicians
  - 70% of Nursery and other health professionals



# Registering Information on IANUS

- More than 1.150.000 writings/month. x3 increase in 2010

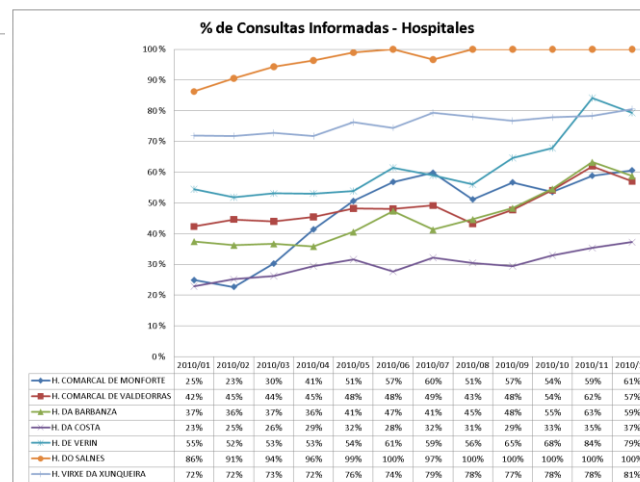
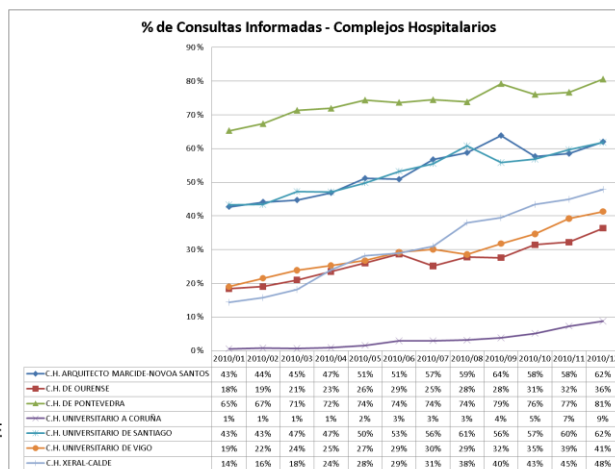
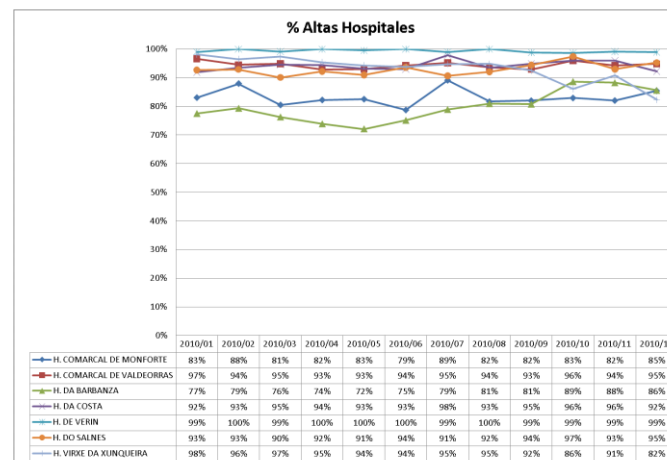
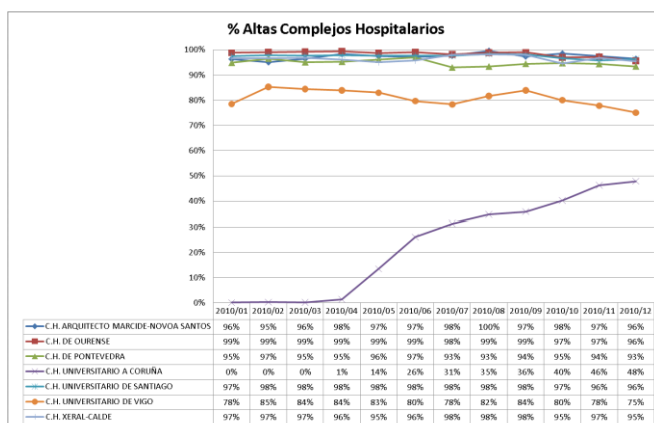
**Anotaciones**





# Registering Information on IANUS

- 90% Discharge Letters available, 1.000.000 Radiology Reports/ year, 200.000 Pathology Reports, ...



# Improving Introduction of Clinical Information

- **IANUS** allows Incorporating new clinical information:
  - **Unified Document Structure** and Presentation for each specialty in all Hospitals.
  - **XML format**
  - **Digital Signature** incorporated in Reports, annotations and e-Prescription
  - EHR, Radiology and Pathology systems share a common reporting module
- **SPEECH RECOGNITION** IS INTEGRATED in IANUS REPORTING MODULE.
  - USED IN RADIOLOGY: 80% Radiologists of all SERGAS (250 users)
  - USED IN PATHOLOGY: 40% Pathologists (50 Users)
  - Preliminary Results in Emergency Care.



# Improving Introduction of Clinical Information

- USE OF SPEECH RECOGNITION IN RADIOLOGY:
- Percentage of “Autoreporting”:
  - From **45%** in 2008 to **77%** in 2010
- Reduce the time from procedure to report:
  - From average of **2,74** days in 2008 to **1,15** days
- Increase in number of Radiology procedures which have been digitally informed.

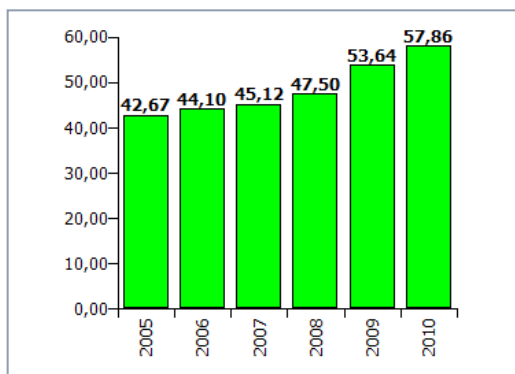
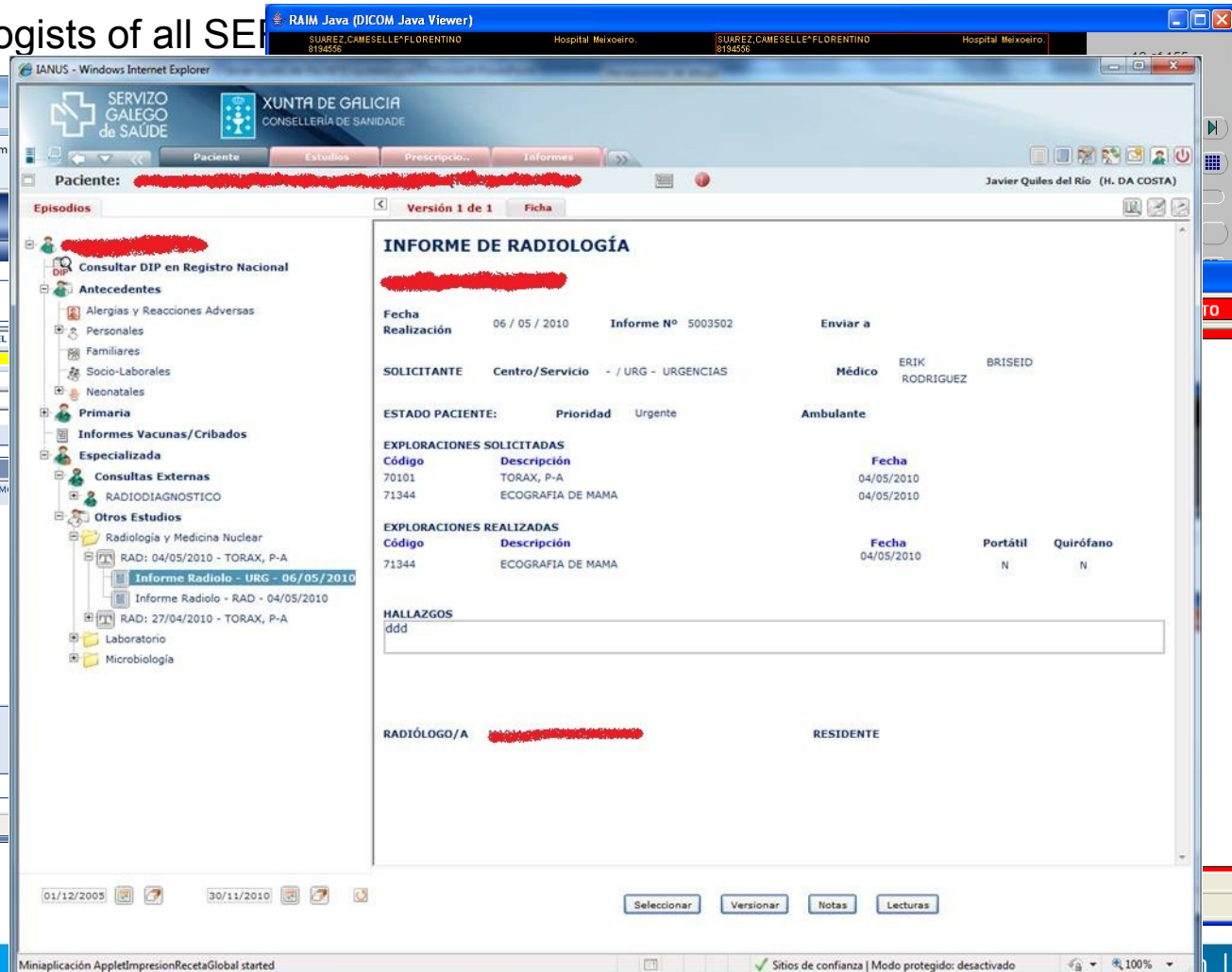
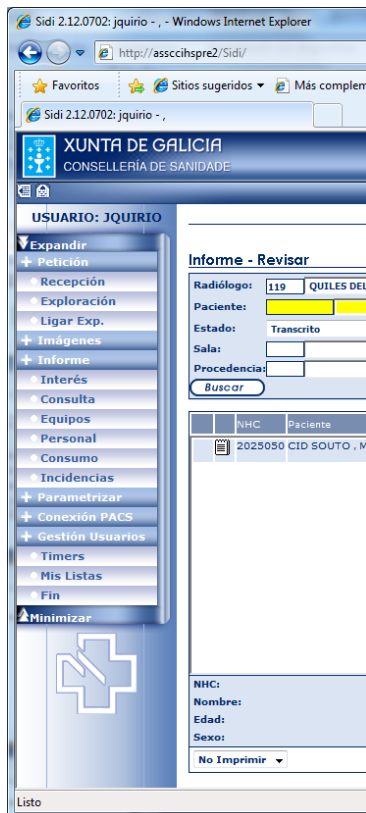


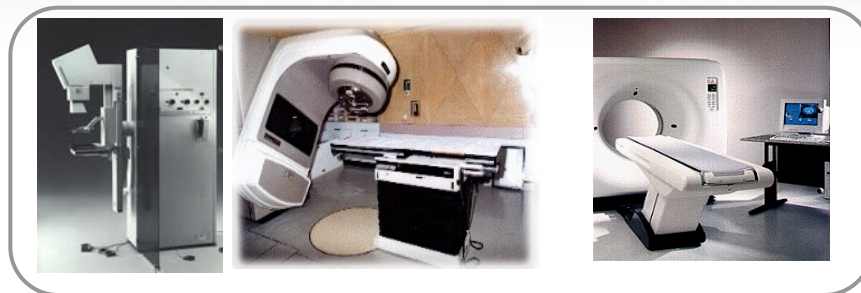
Chart shows the percentage of radiology procedures performed with digitally available report from the total number of radiology procedures

# Improving Introduction of Clinical Information

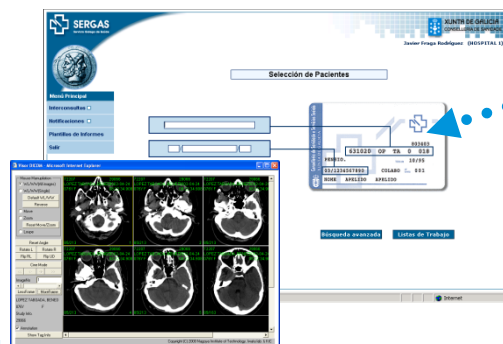
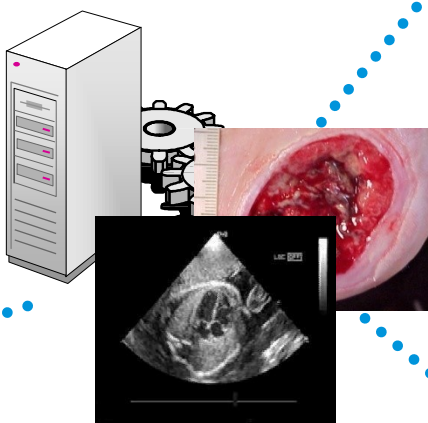
- USED IN RADIOLOGY:
  - 80% Radiologists of all SEI



# Medical imaging



DICOM \ HL7 \ XML



IANUS

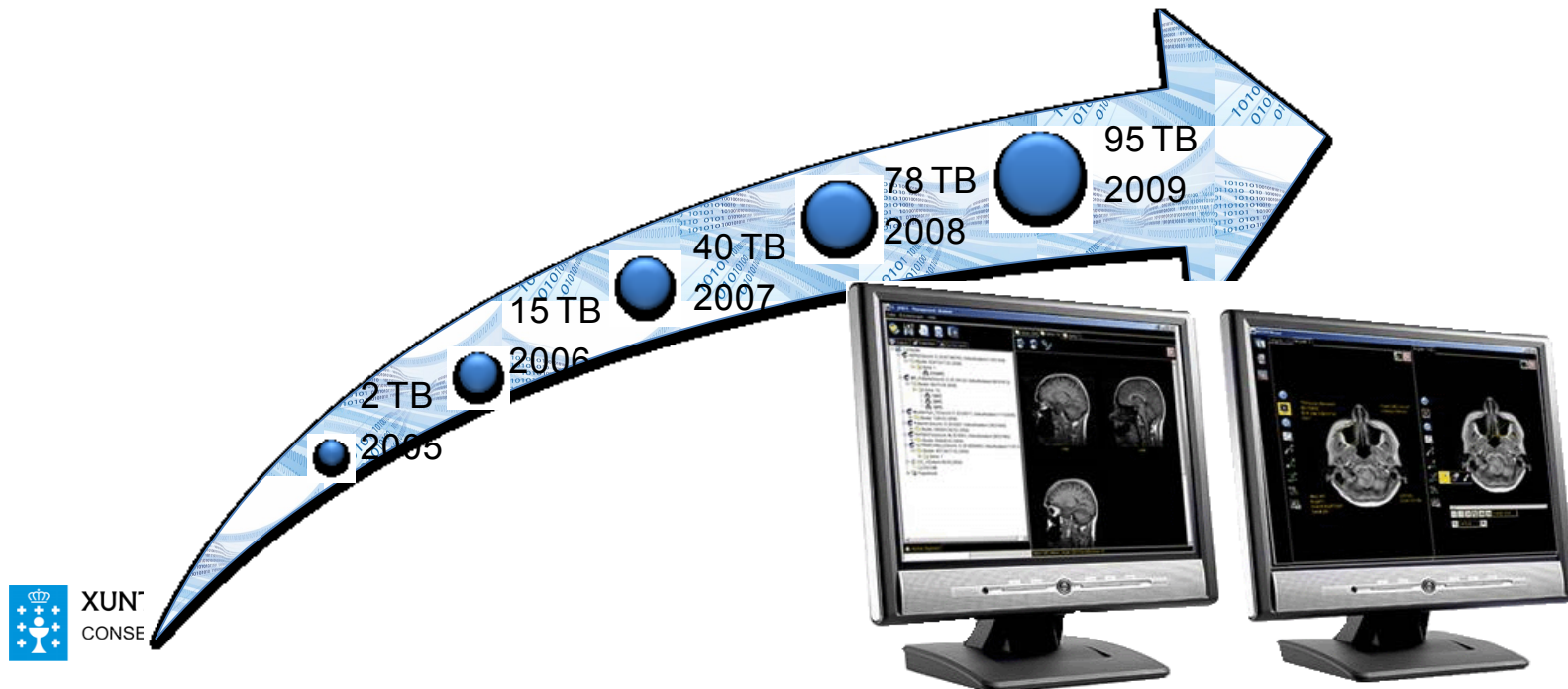


Sistema de diagnóstico  
por la imagen



# Medical imaging

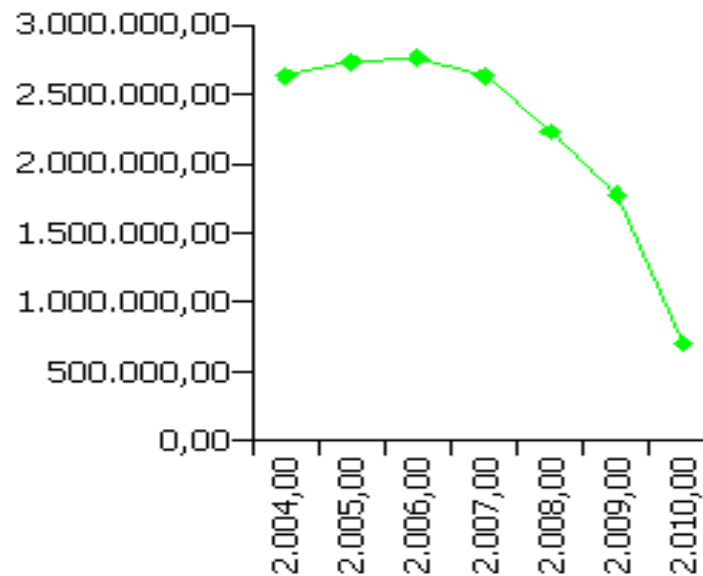
- 90% of all studies are available in digital format in IANUS.
- 250 Diagnostic Workstations incorporated to 14 Hospitals.
- June 2010: 101 TB Image data stored.
- 180 operation theater have been equipped with workstations allowing access to digital imaging and electronic health record
- 60 Primary Care centers access digital imaging. Broadband limitations!





# Film printing cost reduction

- 75% Film spending reduction.
- Annual Saving for 2010: estimated 2.000.000 €
- Environmental impact is highly positive



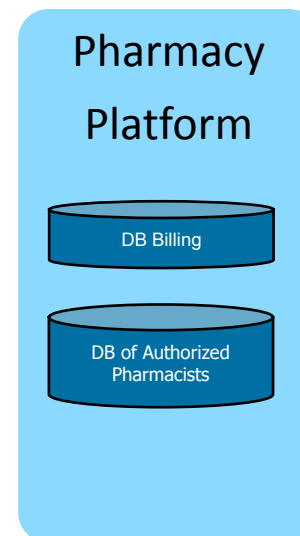
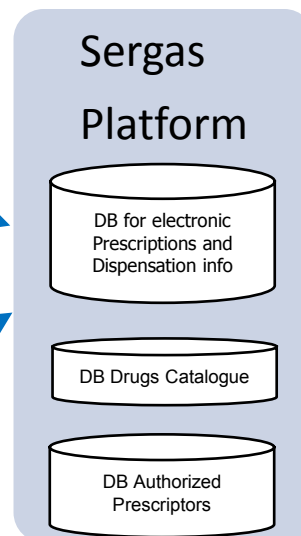
# e-Prescription Model

- User Identification and information secured via Digital Signature.
- Encrypted Communication Channel
- Seamless integration in electronic health records and Pharmacy management software.
- SERGAS is the holder of all Prescription and Dispensation information
- Online shared information between Clinicians and Pharmacists
- Patient holds the card to open Pharmacists access to information

Primary Care ePrescriptions



Secondary Care ePrescriptions





# Regulation of e-Prescription

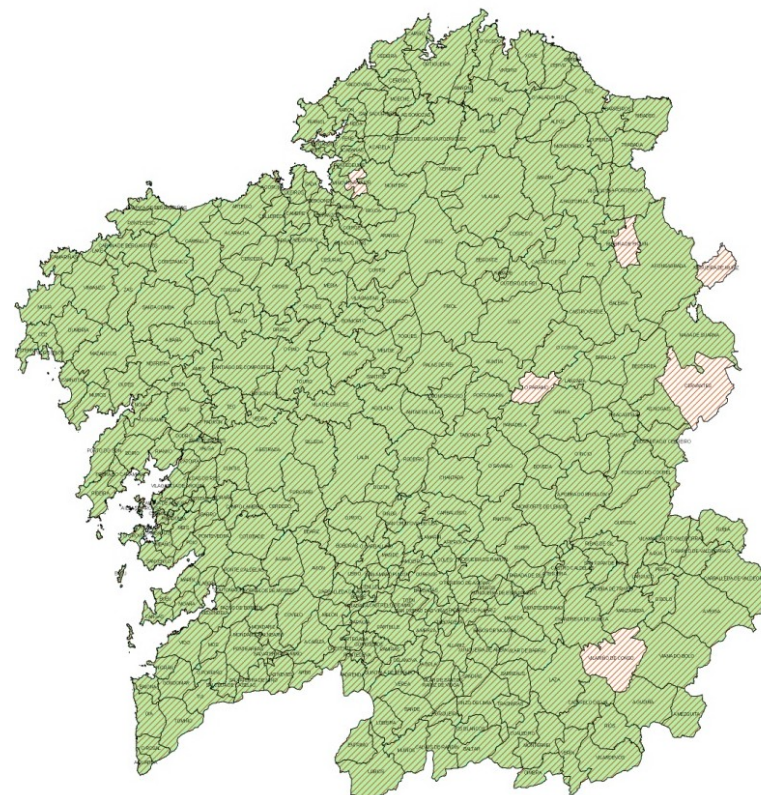
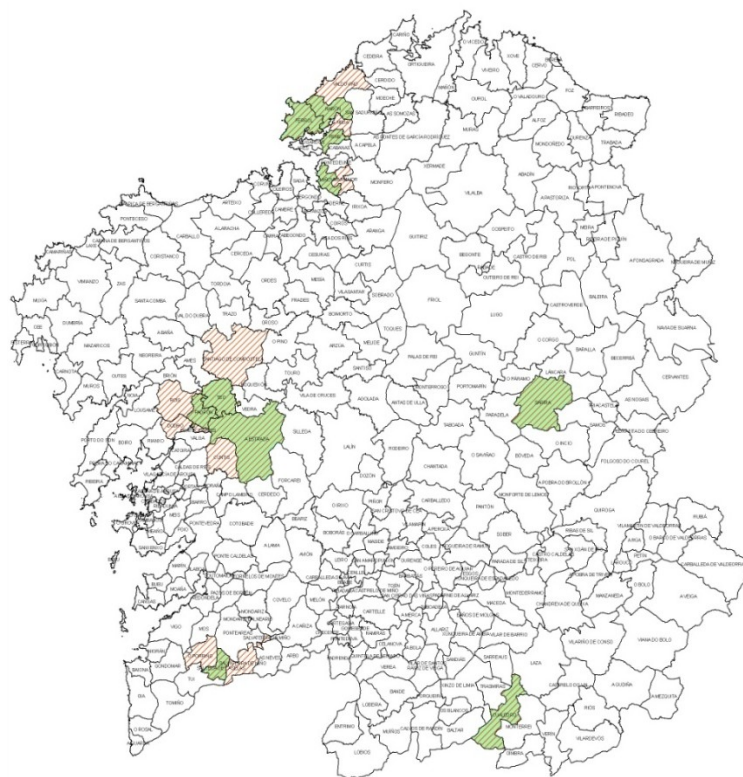
1. E-Prescription treatment may last up to 12 months.
2. Medication is available in pharmacies -10/+20 days up from scheduled data.
3. Active prescriptions summary is available for the patient.
4. Digital homologation is available.
5. Dispensed drugs' recordings are available for pharmacists.
6. Pharmacist may block a prescription due to preventive actions.
7. Information of prescription and dispensation is recorded only at our IT systems.
8. All pharmacists use digital certificates and sign every action they do.
9. Privacy of treatments is available through PIN protection for patients

# e-Prescription: Deployment

Situation April 2009

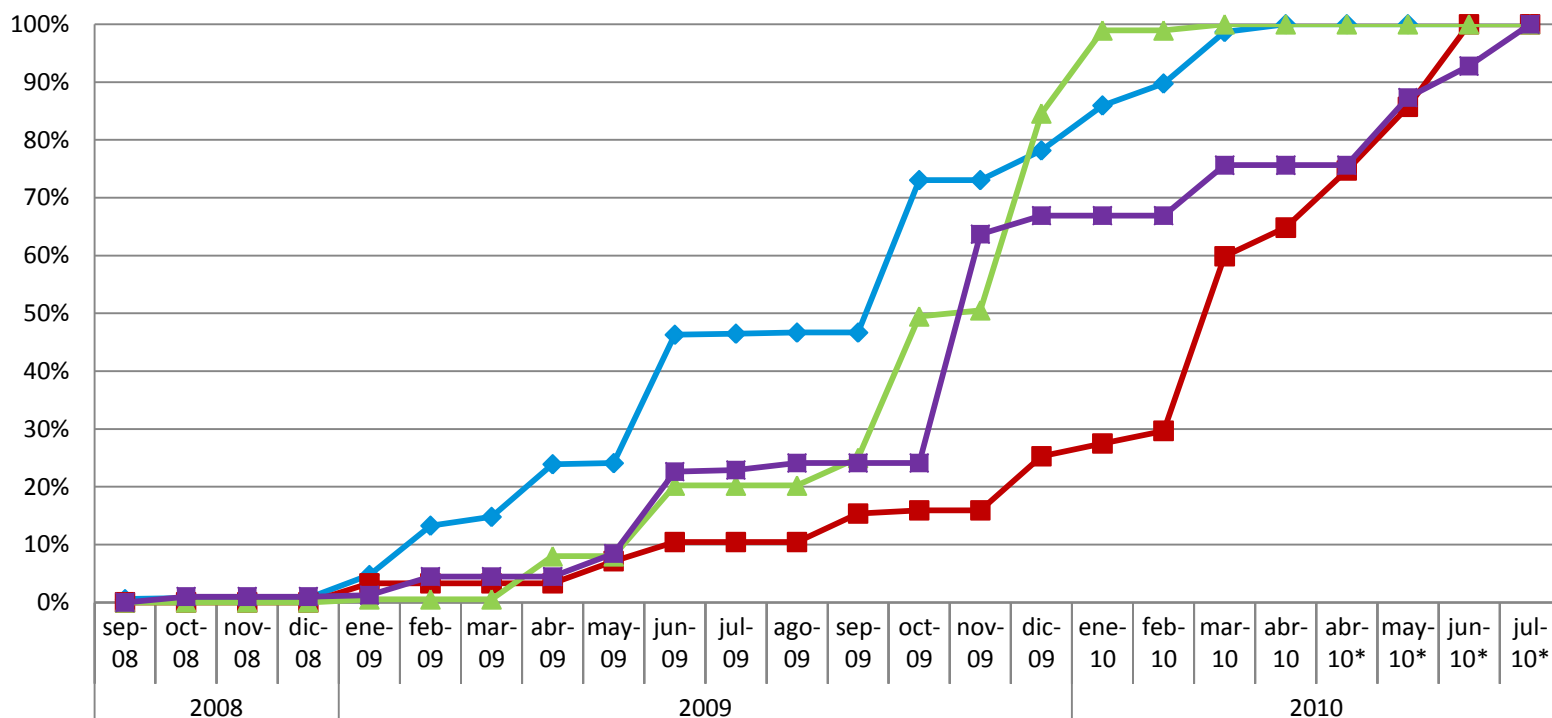
Situation February 2010

-  e-receita en farmacias do concello
-  e-receita en centros de Atención Primaria do concello



# Pharmacies connected: evolution

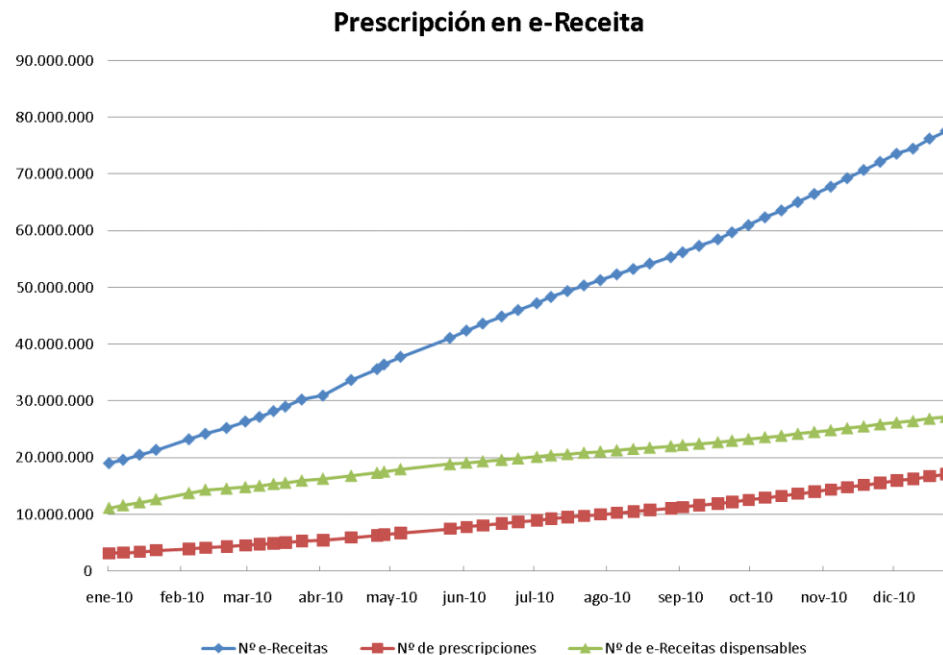
## Pharmacies Conected to e-Receita





# E-Prescription: Information





- Patterns for dispensations are available for future periods with less than 3% variation.
- 50.000.000 e-medications have been generated for future 12 months.
- It is possible to estimate, forecast spending, and take corrective actions
- Before e-Prescription was available, costs were available for us two months after billing and future spending estimations had a +/- 10% variation.





# Professionals

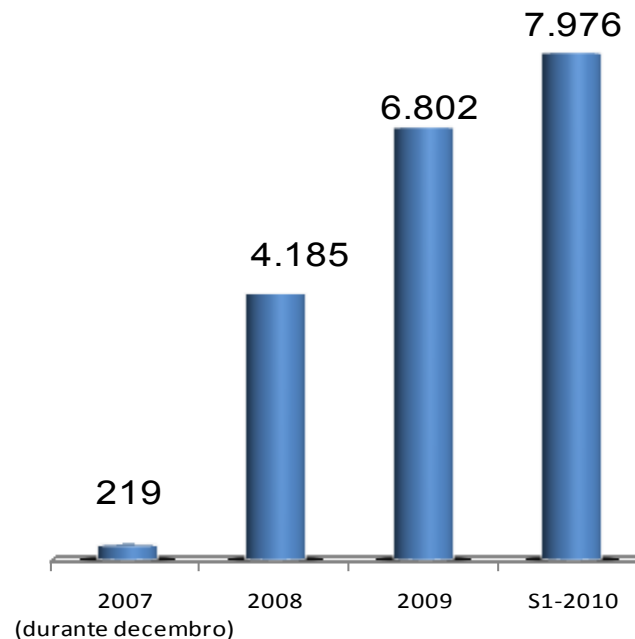
- 
- nto óptimo
- |         |  |
|---------|--|
| 341,67€ |  |
| 528,42€ |  |
| 642,09€ | <a href="#">Pinche aquí para ver detalle</a> |

Posología	F. Prescriptor	Situación	Ficha
1 COMPRIMIDOS cada 24 Hora(s)	SANDRA PICON FERRÓ	ACTIVA	
1 AMPOLLA/VIAL cada 1 Día(s)	SANDRA PICON FERRÓ	ACTIVA	 
1 COMPRIMIDOS cada 1 Hora(s)	SANDRA PICON FERRÓ	ACTIVA	
2 COMPRIMIDOS cada 4 Hora(s)	SANDRA PICON FERRÓ	ACTIVA	
1 COMPRIMIDOS cada 2 Hora(s)	SANDRA PICON FERRÓ	ACTIVA	
8 SUPOSITARIOS cada 24 Hora(s)	LUIS MARIO FERNANDEZ ALONSO	ACTIVA	
8 SUPOSITARIOS cada 24 Hora(s)	LUIS MARIO FERNANDEZ ALONSO	ACTIVA	
1 PARCHES cada 24 Hora(s)	SANDRA PICON FERRÓ	ACTIVA	
6 SUPOSITARIOS cada 24 Hora(s)	LUIS MARIO FERNANDEZ ALONSO	ACTIVA	
Durante 3 Día(s)	FEDERICO RICARDO RAMIRO GONZALEZ	ACTIVA	
1 COMPRIMIDOS cada 24 Hora(s)	LUIS MARIO FERNANDEZ ALONSO	ACTIVA	
1 COMPRIMIDOS cada 24 Hora(s)	LUIS MARIO FERNANDEZ ALONSO	ACTIVA	
1 COMPRIMIDOS cada 24 Hora(s)	LUIS MARIO FERNANDEZ ALONSO	ACTIVA	
1 COMPRIMIDOS cada 24 Hora(s)	MARIA DEL CARMEN NION SEJAS	ACTIVA	

# Information for Patients


- Discharge Reports in the EHR are available online for patients through National Identity Card
- Secondary Care ambulatory schedule is available online
- Personal situation on surgery's waiting lists is available online

**Número de accesos á consulta individualizada de listas de espera**



# Information for Patients

- Sample Prescription List (available soon in the internet)



Usuario: Manuel Ignacio Rodriguez Idioma: [Castellano](#) | [Contacto](#) | [Ayuda](#) | [Logout](#)

Dispensación Prescripciones Operaciones especiales







### ➔ Listado de prescripciones activas


Lorem ipsum dolor sit amet, consectetur adipiscing elit. Suspendisse dapibus congue turpis. Nam massa. Pellentesque te sed mattis adipiscing, felis odio nonummy neque, egestas adipiscing mauris arcu ac lorem. Proin neque. Phasellus ut massa.


Datos paciente [Cambiar paciente](#)


Nombre: Juan Ramón Gonzalez Trigo

PIN:  [Entrar](#) [Ver más datos](#)

Estado	Id prescripción	Producto prescrito CN/Cód.CI	Denominación del producto / P. activo	Fecha dispensación prevista	Acciones
	345454666	987549826338	Texto descripción producto prescrito	21/01/2008	<a href="#">Msg</a>   <a href="#">Bloquear</a>   <a href="#">Ver más</a>
	345454666	987549826338	Texto descripción producto prescrito	21/01/2008	<a href="#">Msg</a>   <a href="#">Bloquear</a>   <a href="#">Ver más</a>
	345454666	987549826338	Texto descripción producto prescrito	21/01/2008	<a href="#">Msg</a>   <a href="#">Bloquear</a>   <a href="#">Ver más</a>
	345454666	987549826338	Texto descripción producto prescrito	21/01/2008	<a href="#">Msg</a>   <a href="#">Bloquear</a>   <a href="#">Ver más</a>
	345454666	987549826338	Texto descripción producto prescrito	21/01/2008	<a href="#">Msg</a>   <a href="#">Ver más</a>
	345454666	987549826338	Texto descripción producto prescrito	21/01/2008	<a href="#">Msg</a>   <a href="#">Ver más</a>

 Prescripción con e-Recetas dispensables.

 Prescripción sin e-Recetas dispensables.

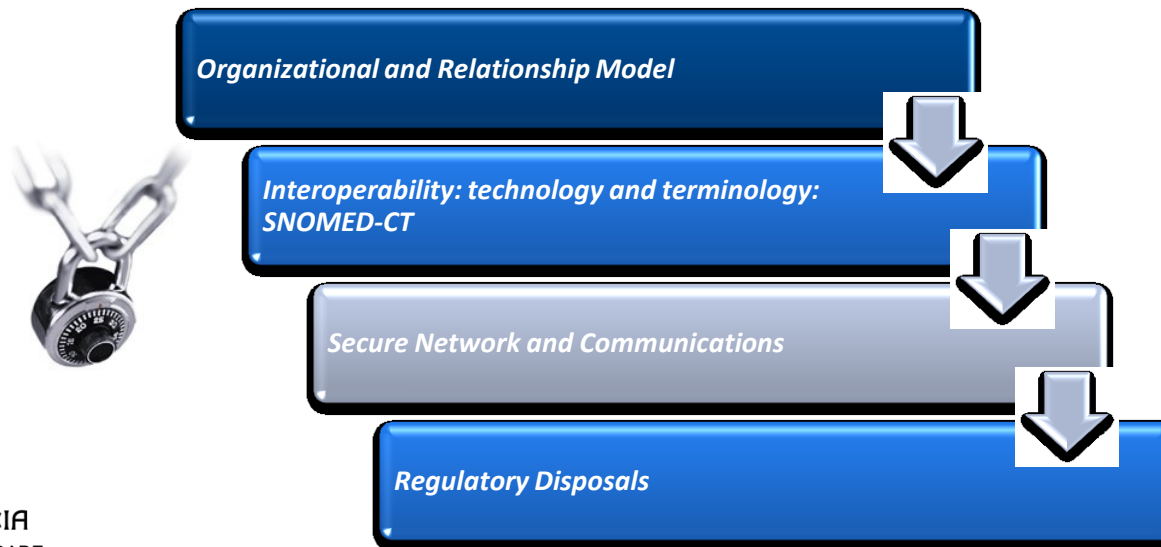
 Prescripción bloqueada cautelarmente.

Dispensación Prescripción Operaciones especiales

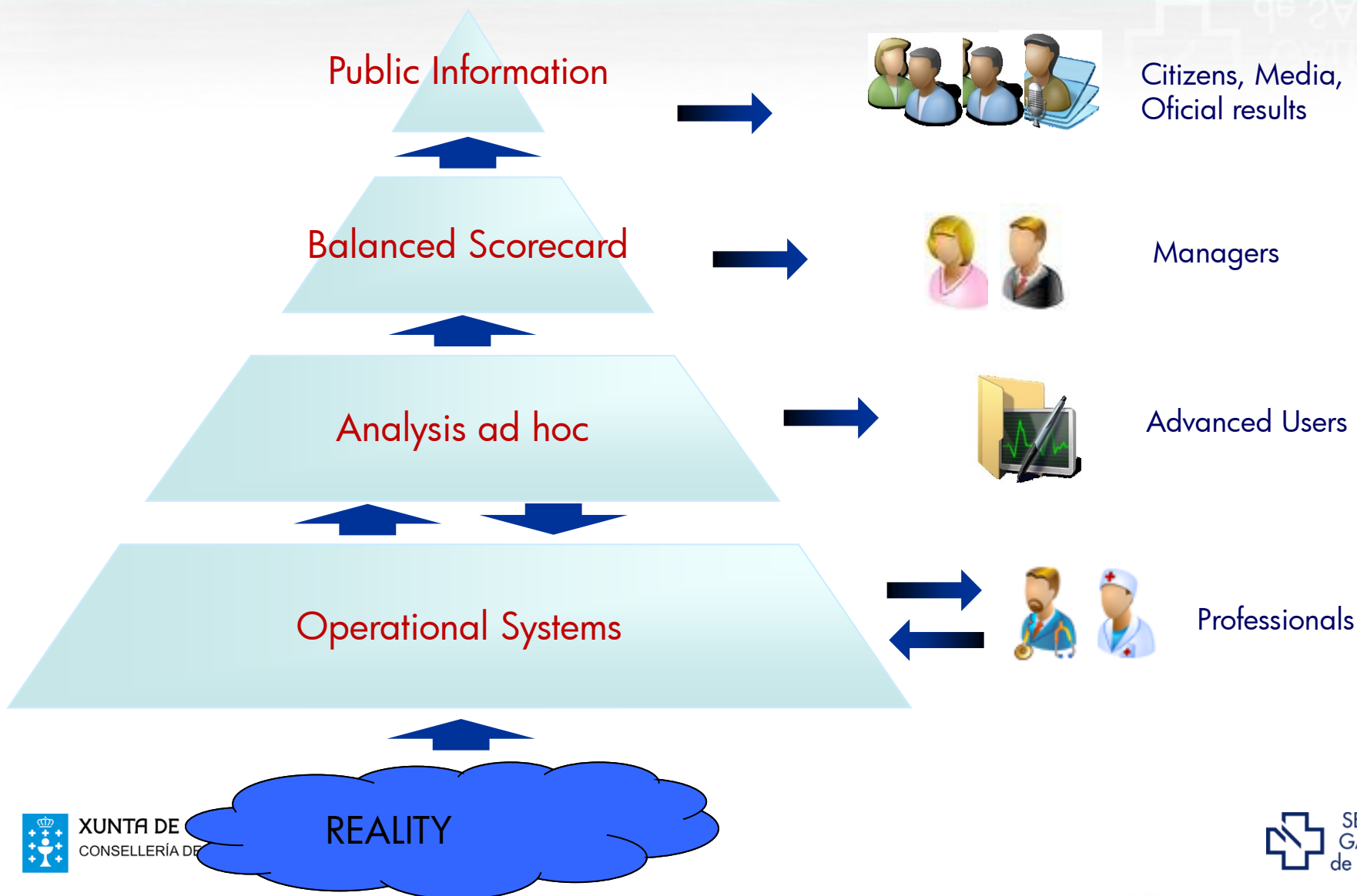
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# Spanish integration scheme

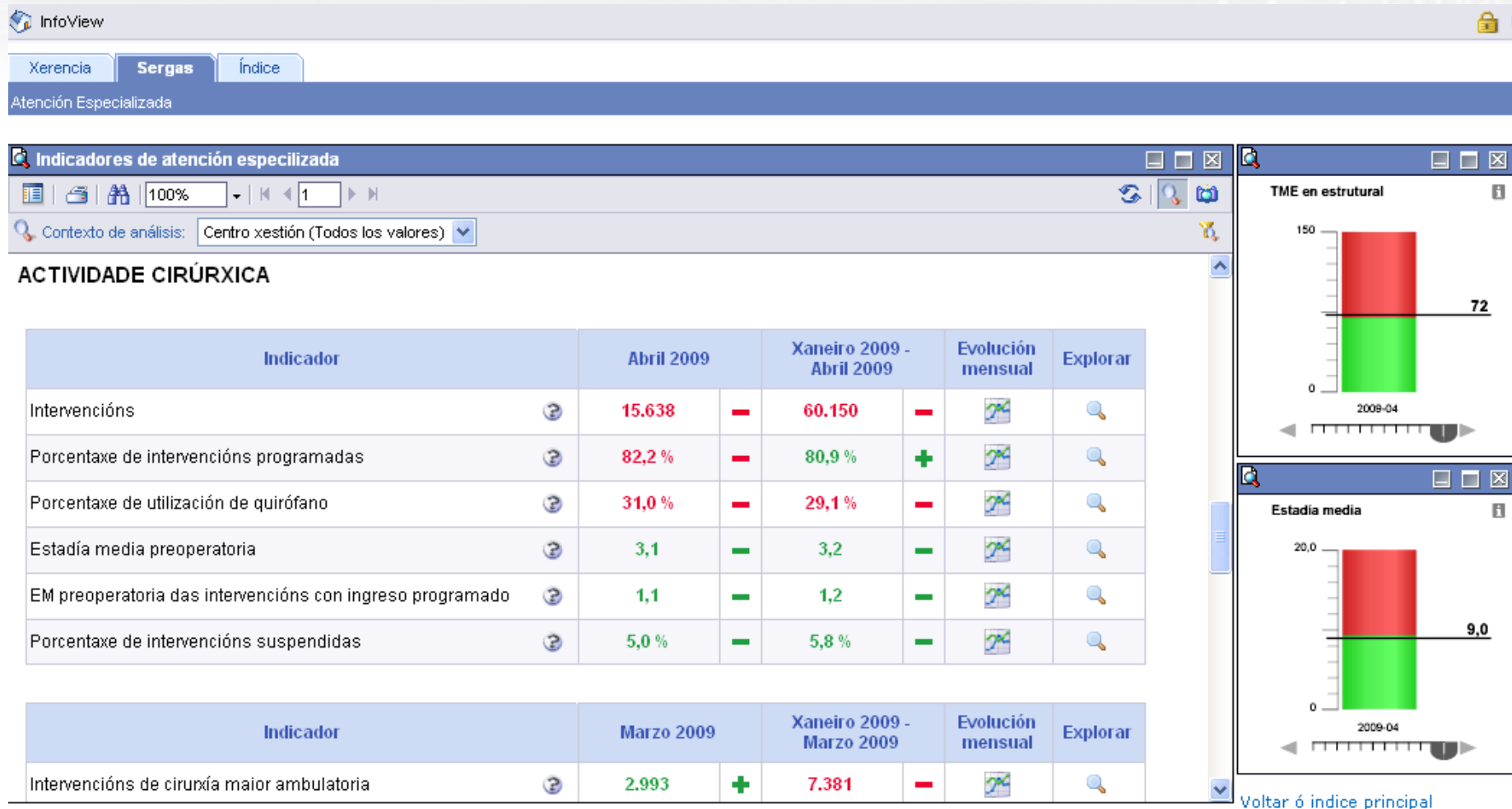
- National Health System
- Shared information for professionals and citizens



# Business Intelligence: Information for the Organization

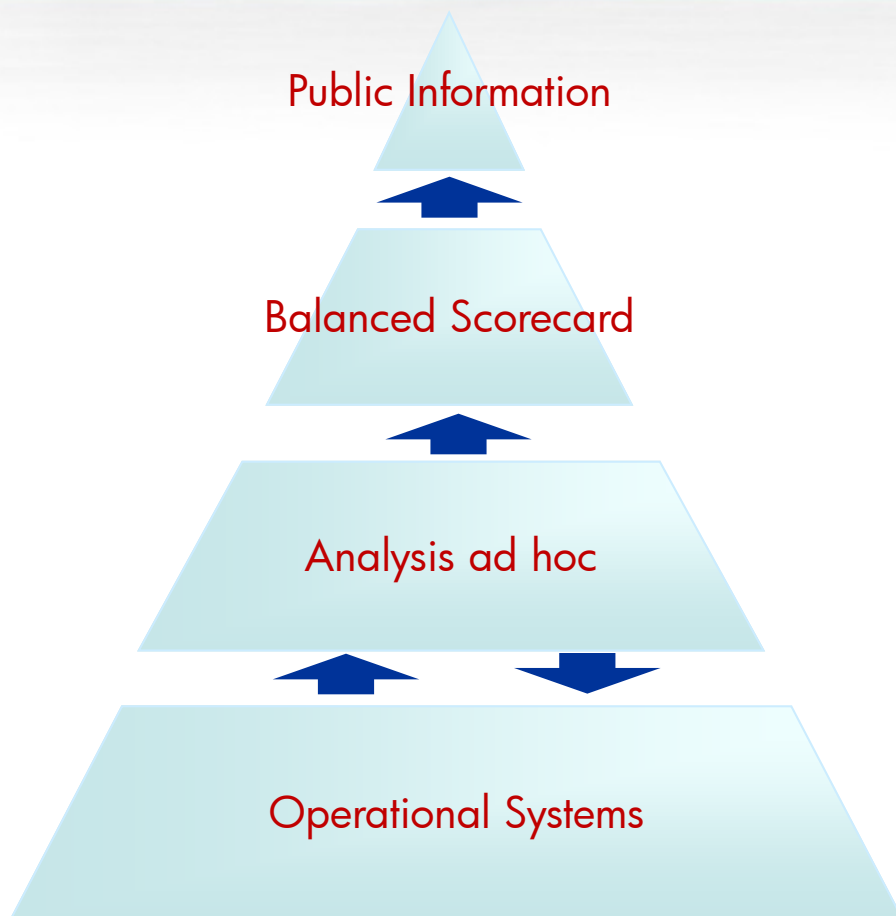


# Balanced Scorecard and Analytic Tools





# Information for the Organization



- **Horizontal Information Structure**

- Population
- Professionals
- Human and Economical Resources
- Procedures and Visits
- Primary Care and Secondary Care
- Medical Treatment
- Public Health
- Electronic Health Care Activity and Audit

- **Volume:**

- > 1.500.000.000 registers
- > 800 indicators
- > 350 dimensions

# Challenges: Change and Risk Management

- Aversion to change
- System Availability
  - Since September 28th 2009 (about 900 days), we had only 10 hours without service (99,9% availability of global system) but... It's not enough

## SANIDAD

### Un fallo en la red del Sergas impidió despachar recetas electrónicas en las farmacias

La avería afectó a todos los servicios relacionados con las nuevas tecnologías

E. Álvarez | 10/4/2010

Valoración ★★★★★ (6 votos)



Las nuevas tecnologías ofrecen múltiples ventajas en rapidez y eficiencia, pero con la enorme desventaja de que cuando todo se bloquea no se puede recurrir a las tradicionales notas apuntadas en papel. El Servicio Galego Saúde fue ayer la víctima, aunque los que de verdad lo sufrieron fueron los usuarios y profesionales del sistema. A última hora de la mañana se produjo una disfunción en la red de datos que dejó a todo el personal sanitario y a los pacientes sin todos los instrumentos que gestionan a través de la red. La consulta de historias clínicas, la receta electrónica o la petición o consultas de citas de atención primaria a través de la página web de la Administración sanitaria fue una tarea imposible durante horas.

Fuentes de la consellería estimaron la incidencia en el soporte de datos en una hora y media -entre las 13.30 y las 15.00- y en toda Galicia, aunque lo



XUNTA DE GALICIA  
CONSELLERÍA DE SANIDADE



# Challenges: Innovation through European Projects.

- Strong Experience on IT projects
  - Consolidated EHR in Primary and Secondary Care
  - Experience Standard Based IT solutions and close collaboration with IHE
  - Experience in Telemedicine. Interreg IIIA associated with ARS Norte - Portugal
  - Experience in Evaluation Methodology for Cost Efficiency and Life Quality Improvement
- 
- Looking for partners!
    - Clinical information analysis
    - EHR as a tool for patient interaction



# Next Steps...

## Provide 100% Digitization of clinical information

- Digitization of paper clinical records
- Connection to all private centers
- Integrate medical equipment
- Develop digital Informed Consent
- Deploy electronic ordering of diagnostic procedures

## Technology solutions for mobility

- Surgery Area, Emergency, Home care

## Enhance Patient Security

- Adverse event detections
- Proactive alarm generation from clinical information systems.
- Interaction prevention
- ePrescription on Inpatients and emergency areas

## Integration and interoperability of systems

- Integrate ePrescription and Electronic Health Record into National Health System and EpSoS

## Telemonitoring and Telecare deployment

## Improve early detection and treatment in critical pathologies

- Standardized procedures for early detection of cancer, acute cardiovascular episodes.





Muchas gracias  
Thank you

