

ICT in the National Health System

The Healthcare online programme



Progress update January 2010

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- 01. Introduction
- 02. The National Health System: basic data
- 03. Healthcare centres connectivity
- 04. Electronic prescription in the National Health System
- 05. Electronic Health Records in the National Health System
- 06. Appointment over the Internet in the National Health System
- 07. Financial information
- 08. National Health System Central Node
- 09. The Avanza Plan in eHealth

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01.

Introduction

The Healthcare Online programme is part of the Avanza Plan, an initiative launched by the Spanish government to accelerate Spain's integration into the Information Society, to increase productivity, strengthen the Information and Communication Technologies (ICT) sector, promote R&D and consolidate modern and interoperable public services based on ICT use.

The Online Healthcare is also part of the Ministry of Health and Social Policy's strategy to "use ICT to improve citizen's healthcare" as described in the Quality Plan for the National Health System, presented in 2006.

The programme is the result of the collaboration in the area of eHealth between the Central Government and the Autonomous Regions which seeks to progress the work already done by the Ministry of Health and Social Policy and the Regional Health Services in improving the quality of service that citizens receive.

Since 2006, the Ministry of Industry, Tourism and Trade, the Ministry of Health and Social Policy and all the Regional Health Services have been working together on the development of the Online Healthcare programme, in the context of the Quality Plan for the National Health System.

The key elements of this programme are:

- Agreement regarding the essential projects for the National Health System (NHS): citizen identification, electronic health records and electronic prescription.
- Harmonisation of the national and regional eHealth agendas.
- Specific financing provided by the Central Government and the Autonomous Regions
- ICT project management and supervision of execution entrusted to a specialised public body, Red.es.

- General objectives agreed upon and built on the respective Regional Health Services' strategies.
- Working closely with the health IT industry in order to share knowledge in strategic areas and ensure that the projects are a success.
- Commitment and responsibility of all stakeholders to achieve results on a nationwide and regional scale.

The goal of the Healthcare Online programme is to allow access to certain elements of citizens' health records from any point of the National Health System using an interoperable health card system that correctly identifies the patient and enables access to his or her health information no matter where it is stored.

In order to achieve this goal, in its first phase (2006-2009), the Healthcare Online programme has enabled the development of the following projects: providing the Regional Health Services with infrastructure and IT services; synchronising the regional health cards databases with the Covered Population Database of the NHS and consolidating a reliable and highly available neutral Node.

The second phase of the Programme (2009-2012) will see ICT projects being developed in the following areas:

1. NHS Digital Health Record Project to enable the exchange of clinical information between the Regional Health Services through the NHS Central Node.
2. Exchange of information related to electronic prescriptions between different Regional Health Services through the NHS Central Node.

3. Regional Health Services' electronic health records and electronic prescription projects.

The first phase of the Healthcare Online programme required: (i) establishing a legal framework that would allow the Ministry of Industry, Tourism and Trade and the Ministry of Health and Social Policy to work together with Spain's 17 Autonomous Regions and with the National Health Management Institute -in charge of providing health services in the Autonomous Cities of Ceuta and Melilla-; (ii) building a joint management model with a view to achieving the programme's objectives and (iii) organising an efficient project management and follow-up framework to guarantee a swift execution.

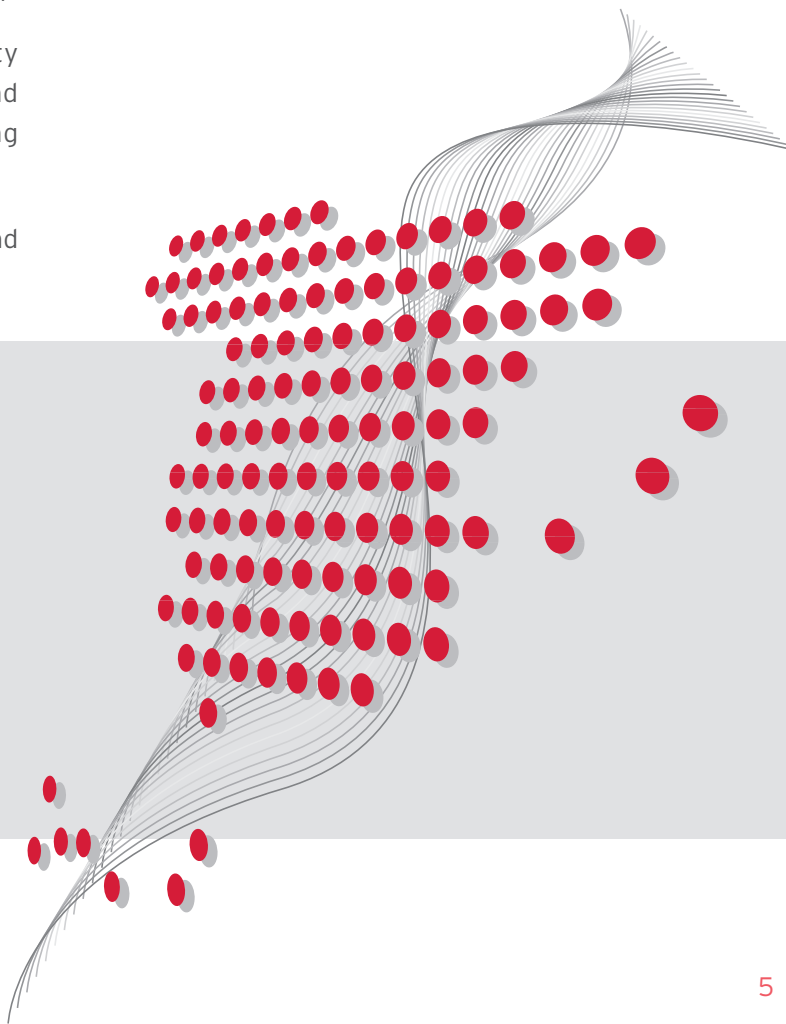
In short, the main results of this first phase have been:

- I. 140 ICT projects in the 17 Regional Health Services, Ceuta and Melilla: providing health centres with equipment to access and use electronic health records and electronic prescription systems as well as for viewing digital medical images; supply and virtualisation of servers; developing eDispensing pilot projects in Cantabria and Murcia; expanding storage systems and installing WiFi networks in health centres.
- II. Increasing the capacity and availability of the NHS Central Node, implementing an Information Security Management Plan, certifying the Central Node against the standards ISO 27001 and 27002 and setting up a backup centre.
- III. Synchronisation of the Regional Health Services' health cards databases with the Covered Population Database, to create a reliable user identification system that will allow the exchange of citizens' medical information throughout the NHS.

For their part, the Regional Health Services have continued to make progress toward consolidating their ICT strategies, strengthening their systems and communications networks, expanding electronic health records and electronic prescription solutions in their territories and, lastly, fulfilling the necessary technical requirements to join the NHS Digital Health Record Project.

The data updates presented in this publication show that major progress has been made as a result of the Autonomous Regions' work, the additional boost which the Online Healthcare entails and the collaboration of the industry; it also highlights that a lot of work still lays ahead and many immediate challenges must be faced, among others:

1. Improving Network and information systems security.
2. Continue with the implementation of identity management systems to provide privacy and confidentiality guarantees when accessing information systems.
3. Keep up with the efforts towards normalisation and standardisation.
4. Offer health professionals a complete view of a patient's state of health, complete roll out of electronic health records in hospitals and the integration of electronic health record systems used in primary care and hospitals while, simultaneously, extending the NHS Digital Health Record Project in all the Autonomous Regions.
5. Successfully conclude the roll out of the electronic prescription in the Autonomous Regions and address prescription and dispensing data exchange between different Regional Health Services
6. Enable access to the population based information available so that health policy makers and managers can analyse it and draw conclusions in relation to healthcare outcomes and factors determining the efficiency of healthcare policies.



02.

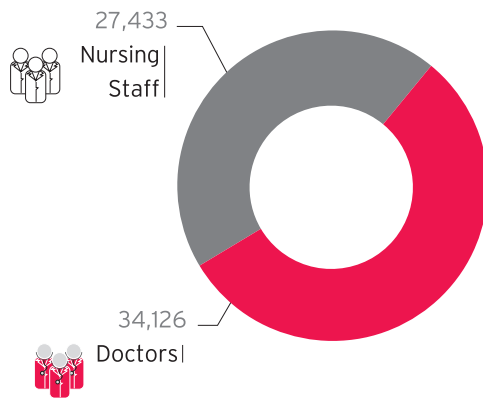
The National Health System: basic data

- The National Health System (NHS) is a co-ordinated ensemble composed by the Regional Health Services and the Ministry of Health and Social Policy. The NHS integrates all the healthcare functions and services for which the public authorities in Spain are responsible by law.

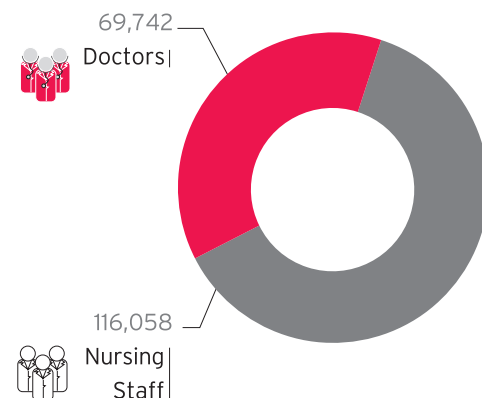
In the current context of the political and regional decentralisation of health competencies in Spain, the Autonomous Regions exercise the main health competencies in the areas of healthcare planning, management and assessment.

- The Ministry of Health and Social Policy is in charge of designing and implementing government policy in the areas of health, healthcare planning and assistance and consumer affairs. In addition it also exercises Central Government competencies aimed at guaranteeing the right of all citizens to health coverage. It is also responsible for designing and carrying out government policy in the areas of cohesion and social inclusion of families, child protection and assisting dependent or disabled persons.

► Primary care Health Centres

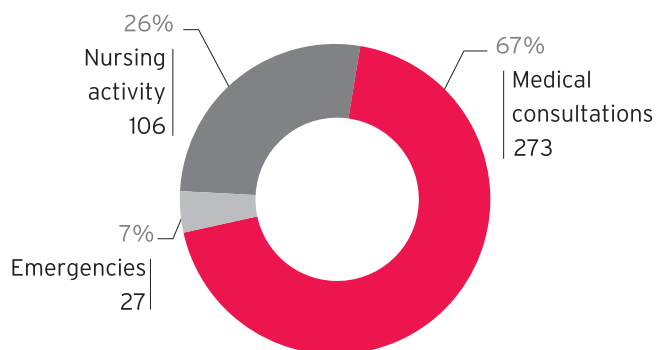


► Hospitals and Specialist Centres



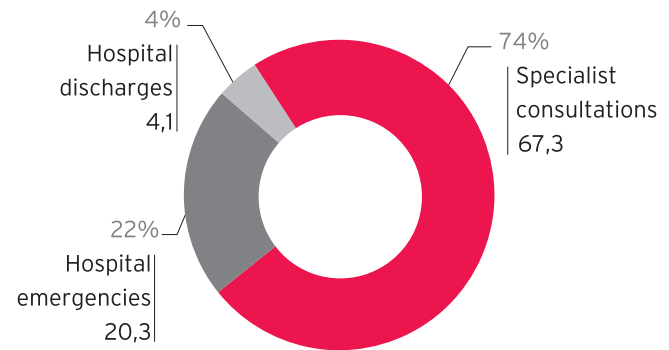
Source: Ministry of Health and Social Policy.

► Volume of annual activity in primary healthcare (millions)



Source: Ministry of Health and Social Policy.

► Volume of annual activity in secondary healthcare (millions)



Source: Ministry of Health and Social Policy.

The National Health Service has a two-level health delivery structure: primary and secondary care. The Individual Health Card issued by each Regional Health Service provides access to public healthcare services and it identifies the citizen as an NHS user both within and outside the Autonomous Region where he or she lives.

In 2009, the Regional Health Services' budget was €58 billion, which represents 1,320 euros per person covered by the system.

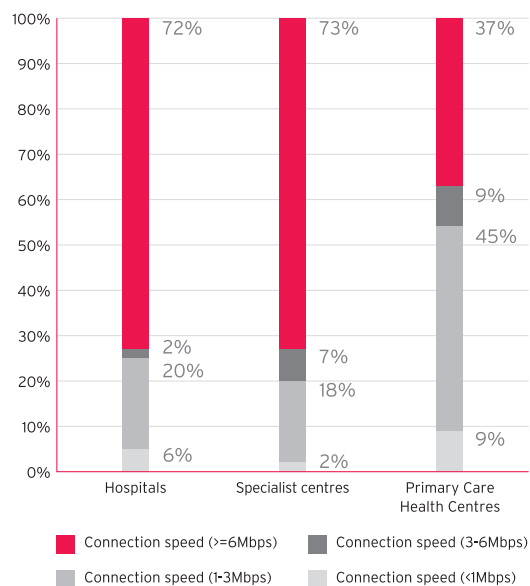
03.

Healthcare centres connectivity



More than **70%** of hospitals and specialist centres have **connection speeds of over 6Mbps** and **91%** of primary care Health Centres are connected to their respective corporate networks through speeds **over 1Mbps**.

► Percentage of healthcare centres by network connection type. National Health System 2009



Source: Compiled using data from the NHS Regional Health Services.



Electronic prescription in the National Health System

► Situation in 2006



► Situation in 2009



■ Implemented ■ Being implemented ■ Pilot ■ Included in current plans □ Not included in current plans

Source: Compiled using data from the NHS Regional Health Services.

Positive evolution from 2006 to 2009.

Accomplished roll out of electronic prescription and eDispensing in three Regions. These services are now available in all their primary care Health Centres and pharmacies: **Andalusia, the Balearic Islands and Extremadura.**

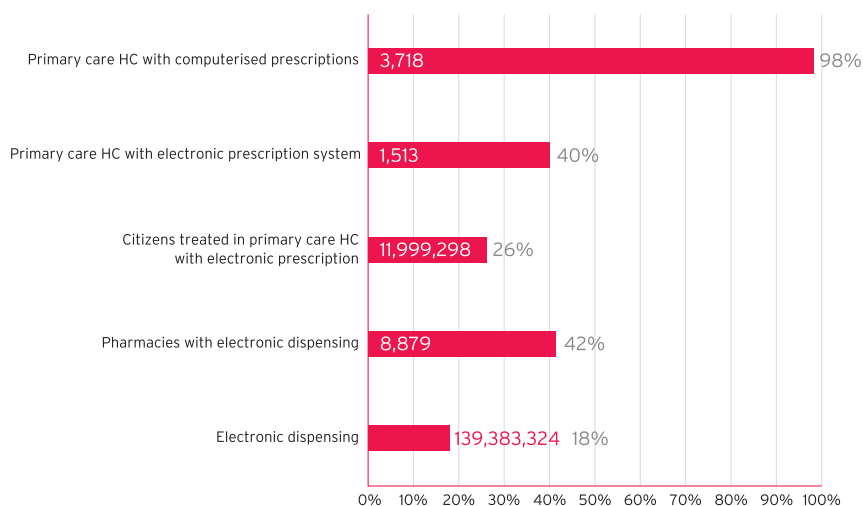
Five regions: the **Canary Islands, Catalonia, Galicia, the Valencia Autonomous Region and the Basque Country** are expanding the service. The others have already begun the first phase of their projects.

42% of the Spanish pharmacies can dispense medication electronically.

40% of primary care health centres have an electronic prescription system that allows e-Dispensing. This service is available for 26% of the population.

In 2009, 18% of the medicines dispensed in Spain were handled electronically.

- ▶ Electronic prescription in primary care Health Centres (HC). NHS 2009

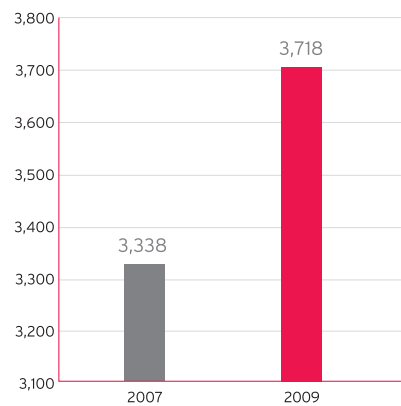


Source: Compiled using data from the NHS Regional Health Services.

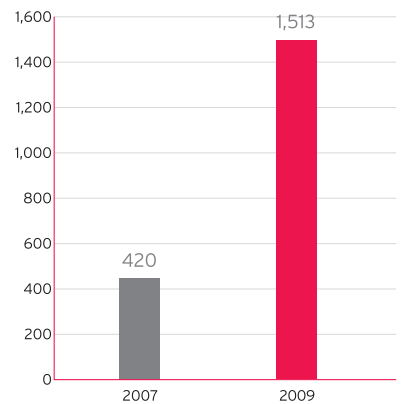


Computerised and electronic prescription in primary care Health Centres (HC) and e-Dispensing. NHS 2007-2009

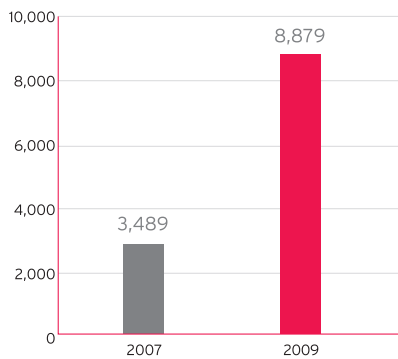
► Primary care HC with computerised prescription



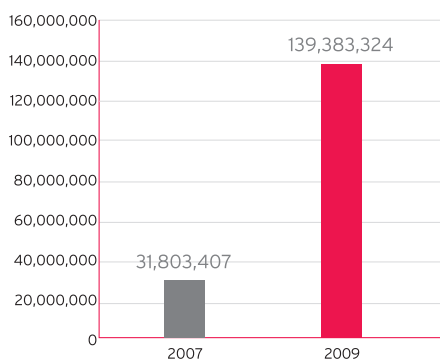
► Primary care HC with electronic prescription



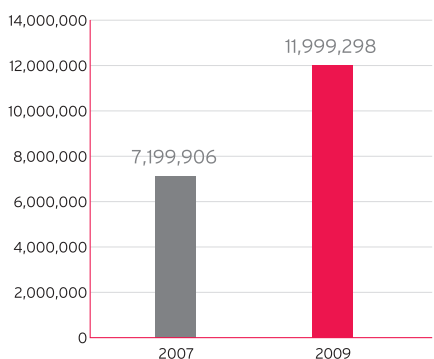
► Pharmacies with e-Dispensing



► Electronic Dispensing



► Citizens treated in primary care HC with electronic prescription



Source: Compiled using data from the NHS Regional Health Services.

05.

Electronic Health Records in the National Health System

Implementation of centralised or integrated Electronic Health Records (EHR) in primary care Health Centres¹. NHS 2006-2009

► Situation in 2006



► Situation in 2009



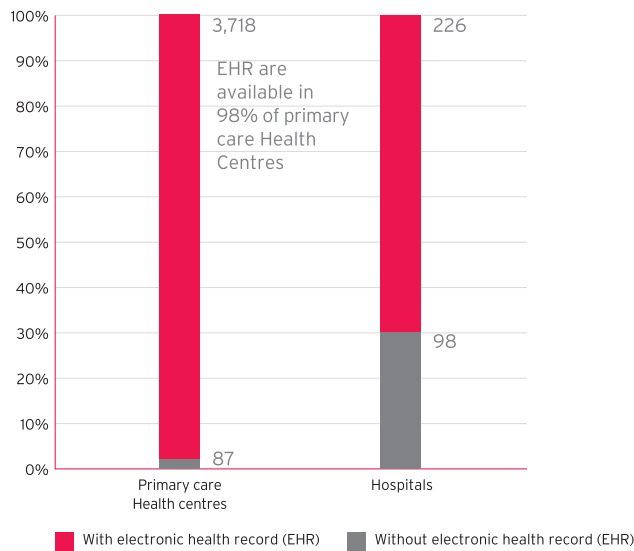
■ Implemented ■ Being implemented ■ Pilot ■ Included in current plans ■ Not included in current plans

Source: Compiled using data from the NHS Regional Health Services.

Considerable progress in integrating EHR within the primary care level. Health centres in 10 Autonomous Regions, Ceuta and Melilla have access to a centralised or integrated EHR system and the other regions are rolling out their solutions.

¹ The graph refers to the level of implementation of centralised or integrated Electronic Health Records in primary care Health Centres. These systems allow healthcare workers to consult patients' Electronic Health Records from any Health Centre in the region and not exclusively from the Health Centre which the patient normally attends.

► Healthcare centres with Electronic Health Records (EHR). NHS 2009

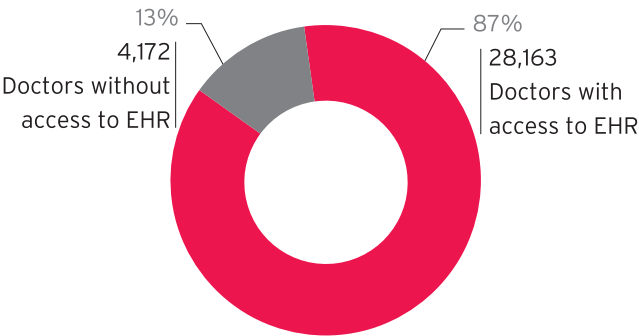


Source: Compiled using data from the NHS Regional Health Services.

- 98% of the primary care Health Centres have an EHR system (off-the-shelf or turnkey solution).
- 70% of NHS hospitals have an information system that includes patient management functions and clinical workstation, deployed by the Regional Health Service as part of its regional EHR project.

- 87% of the GPs and paediatricians working in primary care Health Centres have access to an EHR system.
- 88% of the population has a primary care Electronic Health Record.

► Doctors with Electronic Health Records (EHR) in primary care Health Centres. NHS 2009



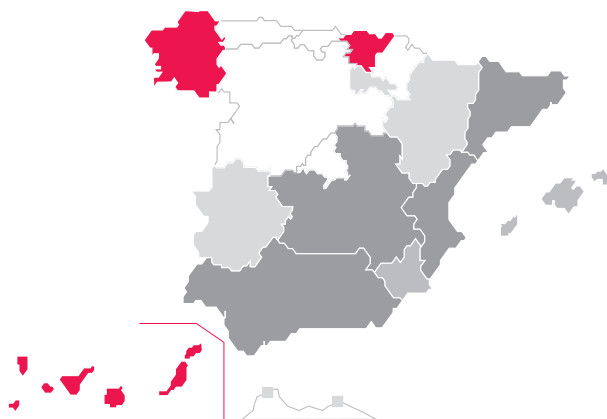
Source: Compiled using data from the NHS Health Services.

06.

Appointment over the Internet in the National Health System

Implementing online appointments in primary care Health Centres. NHS 2006-2009

► Situation in 2006



► Situation in 2009

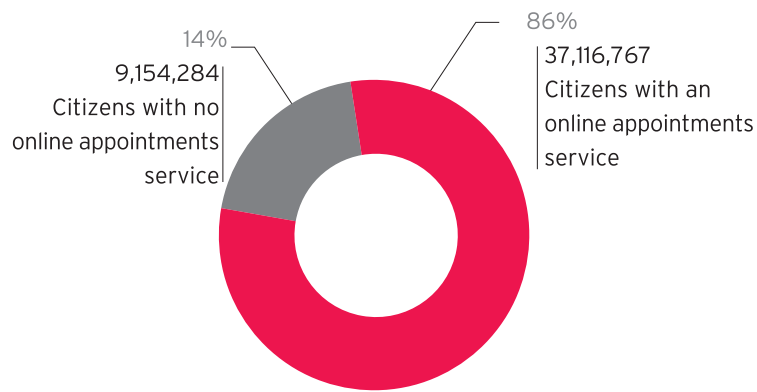


■ Implemented ■ Being implemented ■ Pilot ■ Included in current plans ■ Not included in current plans

Source: Compiled using data from the NHS Regional Health Services.

- By 2009, the Internet appointment service had been rolled out in primary care Health Centres in **11 Autonomous Regions**, 4 more are implementing it and another has already begun its pilot project.
- In 2006, 3 regions had the service in their Health Centres so that citizens could make online appointments with GPs and paediatricians, another 4 were implementing the service and 1 had a pilot project.

► Online appointments in primary care Health Centres (HC): citizens, centres and appointments. NHS 2009.



3,321 health centres
(87%) have an online
appointments service



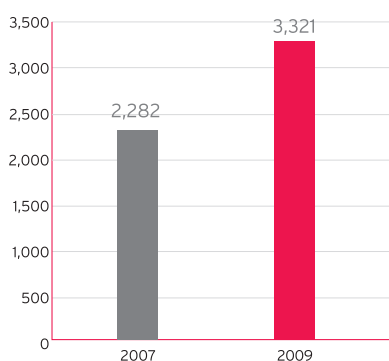
12,464,018 appointments
in health centres (3.28%)
were requested online

Source: Compiled using data from the Regional Health Services.

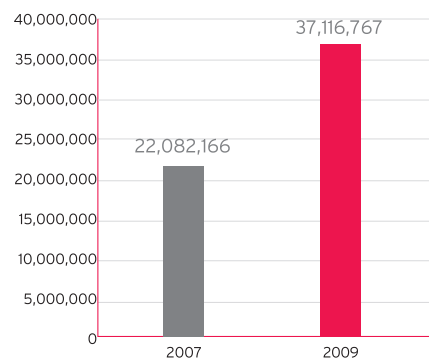
In 2009, more than 12 million appointments to see paediatricians and GPs were requested online.

86% of Spanish citizens are registered at the 3,321 primary care Health Centres that offer the Internet appointments service.

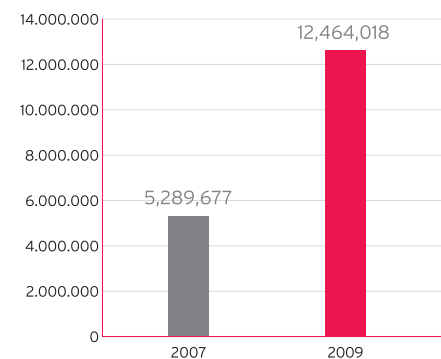
► Primary care HC with online appointments service



► Citizens registered at primary care HC with online appointments service



► Number of online appointments



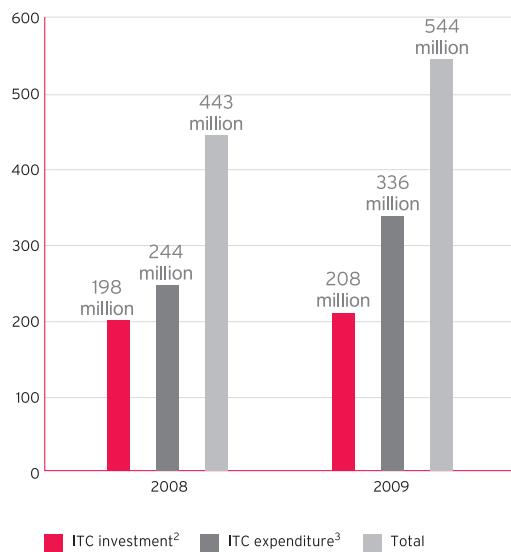
Source: Compiled using data from the Regional Health Services.

In 2009, 37 million citizens can benefit from the online appointment service in the National Health System, which represents a 67% increase over two years.

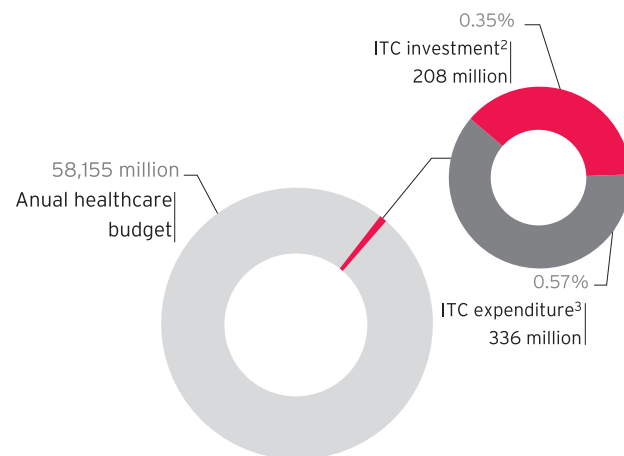
07.

Financial information

► Healthcare ICT Investment and Expenditure. NHS 2008 and 2009



► ICT Investment and Expenditure as a percentage of the Healthcare Budget. NHS 2009



² ITC investment: this includes the Regional Health Services' investment into hardware, rollout and management of network electronics, as well as bespoke developments and purchasing of licences.

³ ITC Expenditure: this includes hiring computer equipment, technical support, cost of maintaining the hardware installed in the healthcare centres and the central services of the Regional Health Services, ICT personnel expenses (Regional Health Services' own employees who carry out work associated with the implementation, maintenance or management of this type of technology and/or its content).

Source: Compiled using data from the NHS Regional Health Services.

Healthcare ICT expenditure and investment in the National Health System accounted for **0.9%** of the Regional Health Services' overall healthcare budget in 2009.

National Health System Central Node

The NHS Central Node for exchanging information

The NHS Services architecture is a technology project encompassed within the European i2010 initiative and the Avanza Plan for Developing the Information and Knowledge Society.

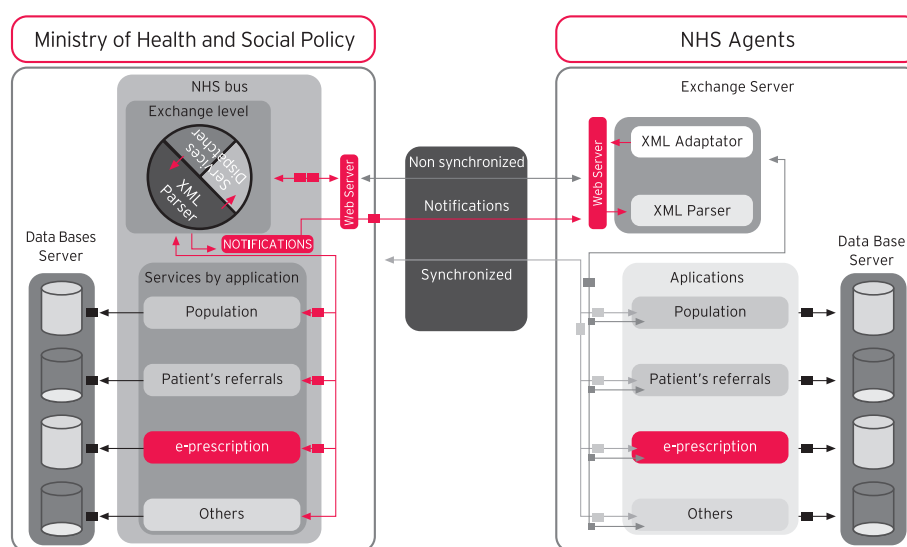
The system enables information to be exchanged from following databases: covered population, cohesion fund, prior instructions, register of healthcare professionals, electronic prescription, digital health record and other services.

The NHS IT services are based on a framework of interoperability that enables the Regional Health Services' information systems to be integrated. Information exchange standards are used (XML messaging) and platforms and applications remain independent.

Therefore, on a technological level the NHS is built as a service-oriented architecture (SOA) that supports

decentralisation, putting information and services at the disposal of Regional Health Services in order to ensure citizens receive healthcare.

Through the Healthcare Intranet, the XML exchanger is the hub that connects all the different agents (Autonomous Regions, other Ministries, etc.) that interact with the NHS and vice-versa.



The Avanza Plan in eHealth

Five-year plan 2006-2010, extended to 2012

Digital Citizenship

- More households equipped and citizens using ICT as part of everyday life.
- Social inclusion and bridging the digital divide.

- Loans to families, young people and students
- Telecentres
- Encouraging women to use the Internet
- Digital alphabetization campaigns
- E-Inclusion of elderly and people with disabilities

Digital Economy

- Greater adoption of ICT among SMEs and businesses in general (e-commerce, electronic billing).

- Avanza SME, Online industrial parks
- Training in ICT and webpage adoption program
- Technology loans
- Profit R+D+i and driver projects
- Dominio.es

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Digital Context

- Extending broadband and mobility coverages.
- Increasing confidence in the security of ICT.
- Development of digital content.

- Broadbands and mobile telephony Extension Plans.
- National Plan for Transition to DTT (Digital Terrestrial Television)
- Internet security (INTECO)
- Plan to promote digital content
- Open source software (CENATIC)

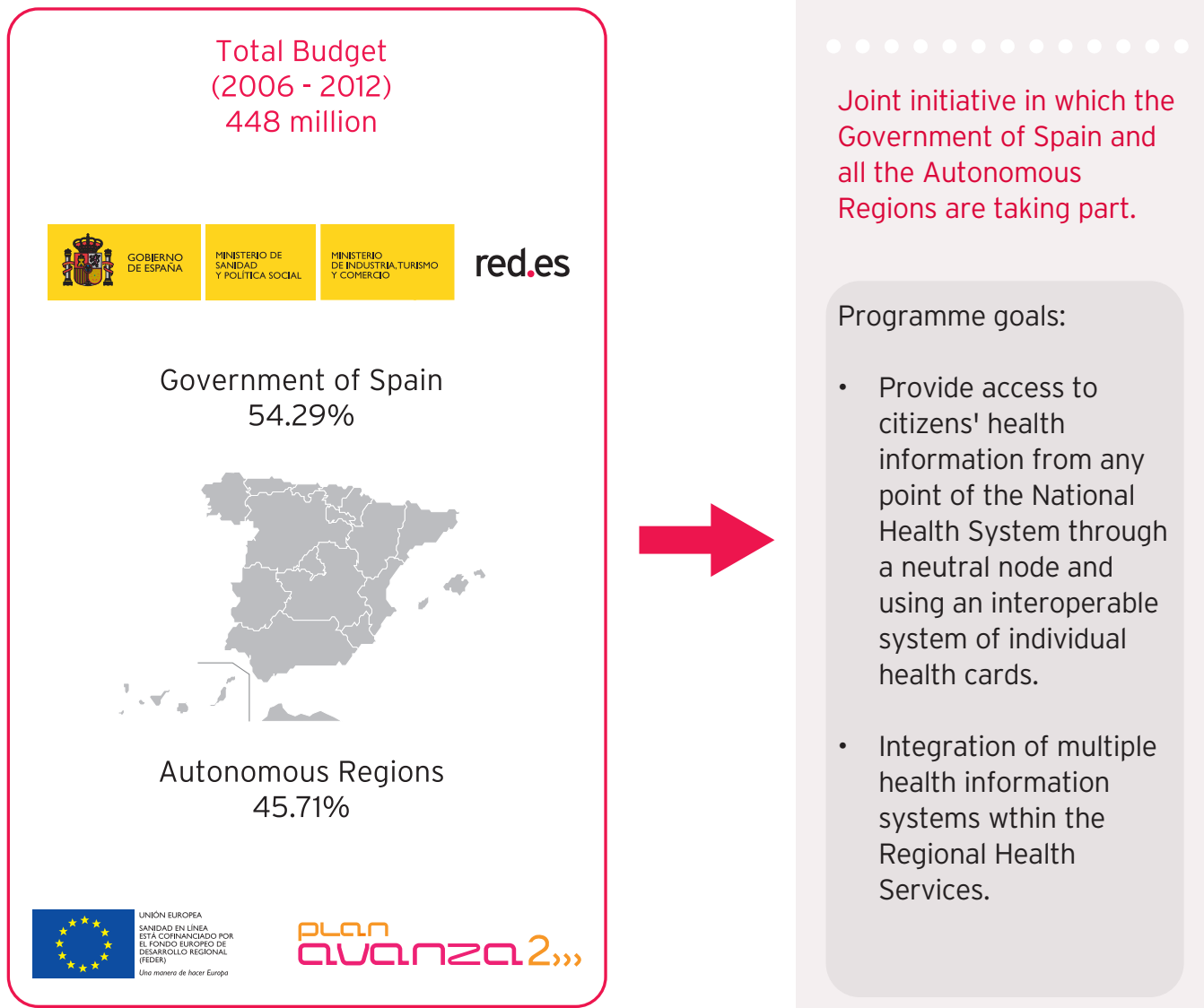
Education and Public Digital Services

- Transition from a traditional education to education for the digital age, with IT equipment and connection to the Net.
- e-Administration.
- e-Health.
- e-Government.

- Networked education
- Public Health System on-line
- Networked administration. Networked Civil Registers
- Electronics ID card

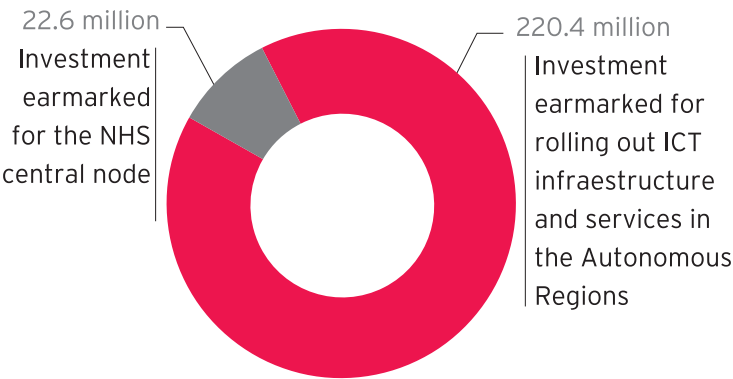
More than
11 Billion Euros
on a 'share
effort' scheme
mobilized in **5**
years.

Avanza Plan: Spanish Government and Autonomous Regions investment in eHealth (2006-2012)



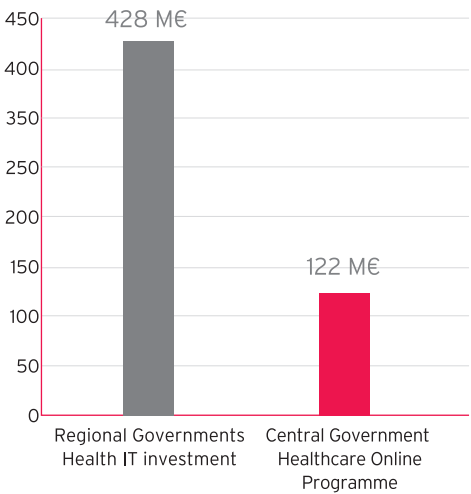
Results of the Healthcare Online programme

- ▶ Avanza Plan: Spanish Government investment in eHealth (2006-2012)



Source: Framework Agreements of the Online Healthcare programme, phase I and phase II

- ▶ Total Health IT investment by Regional Health Services and Central Government. 2006-2009



The investment by the Central Government made over the last four years within the Healthcare Online programme represents 28% of the amount invested by the Regional Governments for the period 2006-2009

Source: Compiled using data from the NHS Regional Health Services and Red.es.

Results of the Healthcare Online programme. January 2010

► Healthcare Online programme Indicators. 2006-2009.

Indicator	Value at Dec. 2007	Value at Jan. 2010
Installed equipment (PCs, printers, servers, monitors)	76,742	102,379
Beneficiary healthcare centres	5,125	6,344
Central services involved in the programme	125	292
 Healthcare professionals working in these centres	182,081	201,139
 Administrative personnel working in these centres	48,377	51,802
 Citizens registered in these centres	28,172,858	39,121,890

Source: Compiled using data from the NHS Regional Health Services.

► Indicators from the electronic prescription pilot programme in Cantabria. June 2009-January 2010

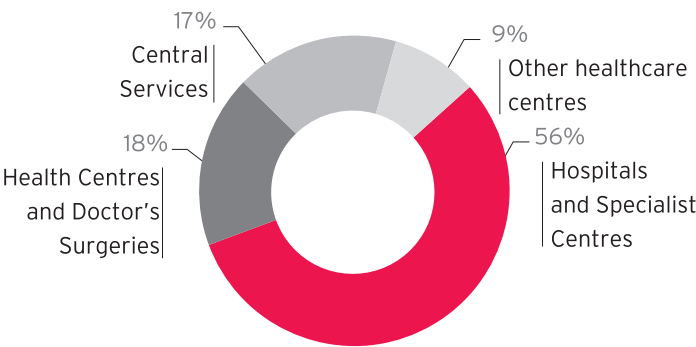
				
Pharmacies	Electronics prescriptions	e-Dispensations	Health Centres	Citizens
3	2,995	5,647	1	14,251

Source: Compiled using data from monitoring the electronic prescription pilot programme

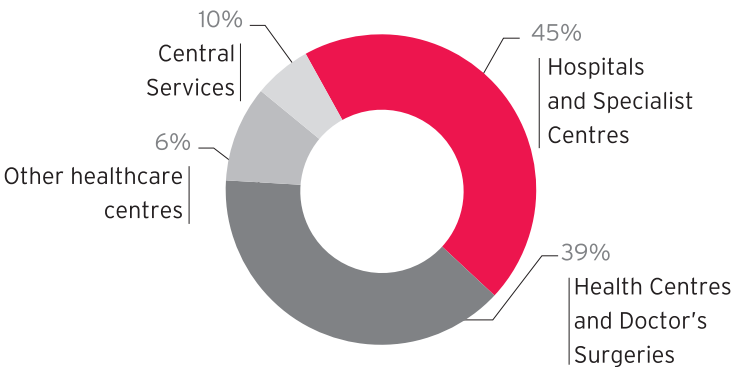
Results of the Healthcare Online programme

► ICT equipment supplied by Central Government by the Healthcare Online programme

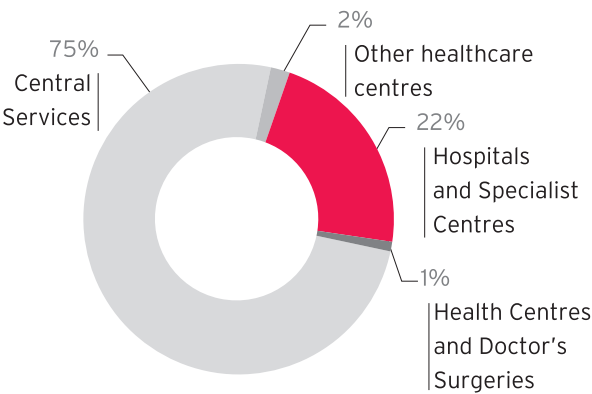
► PCs (61,820 units in total)



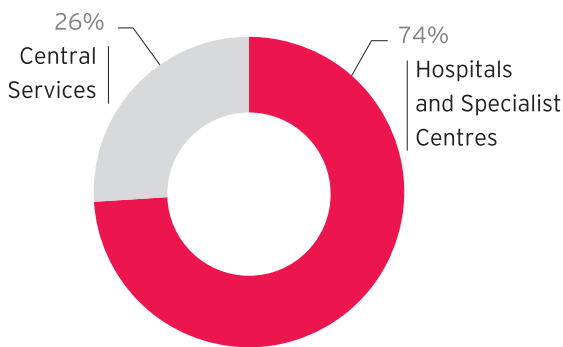
► Printers (37,954 units in total)



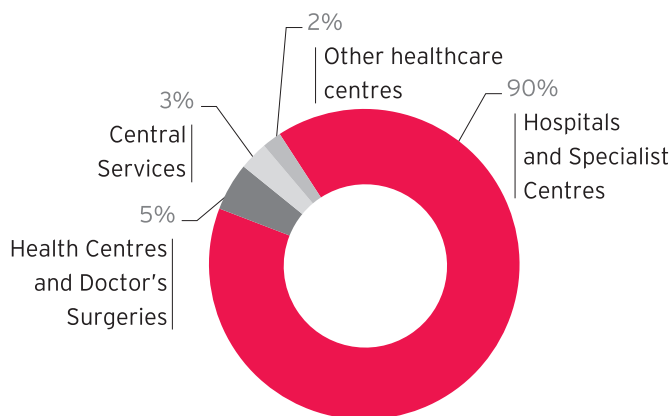
► Servers (2,114 units in total)



► Storage TBytes (749 units in total)



► High resolution monitors (491 units in total)



Projects in the NHS Central Node

Capacity and availability of the NHS Central Node enhanced.

Security Plan for the NHS Central Node implemented and certified against ISO 27001 and 27002 standards.

Backup centre set up.

Synchronisation of the Regional Health Services' health cards with the covered Population Database, key to enable the exchange of citizens' clinical information throughout the NHS.

Source: Compiled using data from the Regional Health Services.

The Healthcare Online programme: actions to be performed in 2010

The II phase of the Online Healthcare programme pursues a double aim:

1. Ensure progress towards the interoperability of electronic health records and electronic prescription systems within the NHS.
2. Support the Regional Health Services in their strategies to roll out EHR and e-prescription systems.

As the data presented in this publication reflects, progress toward the implementation of these services differ across the NHS Regional Health Services. The goal is to achieve the same level of service availability and maturity throughout the NHS.

Both objectives will guide the projects to be launched in the next three years. In 2010 the agents involved in developing the programme have agreed to earmark the funds from the Central Government and the management resources placed by Red.es, to develop projects in the following areas:

- **Security and contingency plans** for the Regional Health Services' data centres to guarantee system recovery of EHR systems, e-prescribing systems, citizen identification systems, etc., in the event of any incidence.
- Roll out **identity management systems**.
- Implementing **platforms** to enable intra-hospital **interoperability and integration of information systems within the Regional Health Services**.
- **Access to digital images and electronic health records from operating theatres**.
- **Mobility solutions** to access electronic health records from the patient's bedside
- Adjusting the ICT infrastructure of data centres that provide service to hospitals to enable the roll out of electronic health records in these centres, achieve **more efficient infrastructure management and optimise energy saving**.
- **Provide the storage systems and servers** needed to extend the Regional Health Services' EHR and electronic prescription systems.

