Country Brief: Spain

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About the *eHealth Strategies* study

The eHealth Strategies study analyses policy development and planning, implementation measures as well as progress achieved with respect to national and regional eHealth solutions in EU and EEA Member States, with emphasis on barriers and enablers beyond technology. The focus is on infrastructure elements and selected solutions emphasised in the European eHealth Action Plan of 2004.

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Executive Summary

In Spain, most regions have their own documentation related to healthcare. Due to that there have been different levels of development in different regions however all autonomous regions have agreed to focus on collective key areas. The national government has launched the *Quality Plan* which sets out common lines of action in order to extend the services within each province to all. Alongside this the government has also launched the plan *Avanza* which aims to support various key eHealth objectives and connect the regional healthcare systems via ICT.

In order to consider the progress that has been made so far in Spain towards reaching eHealth interoperability objectives the following eHealth applications have been examined: patient summaries, electronic health records (EHR), ePrescription, standards, and telemedicine. In Spain the situation is as follows:

The field of EHRs has been a recent priority for Spain and as a result there are currently 9 regions participating in a pilot study where access to various electronic documents through the national switching point (including the patient summary) is tested. The pilot started in 2008 and deployment is planned to start in 2011. Although there are already varied electronic medical records in existence at a regional level a more cohesive scheme is to be established.

The electronic transmission of prescriptions to pharmacies is regional routine in Spain. Since the Law of 29/2006 on the Use of Medicines prescriptions can be printed, but can also be stored and, in time, accessed electronically from any dispensation point in Spain. In terms of ePrescription the stage of implementation of services varies between regions in Spain, thus an appropriate agreement between regions and the ministry of health is needed to extend this development.

The Ministry of Health has been the representative for Spain for the International Health Terminology Standards Development Organisation since 2009 and assumes liability for the distribution of SNOMED CT within Spain. However, each autonomous community has the right to decide which standard it uses. It is therefore the Ministry of Health's responsibility to develop a national version of common standards that allow interoperability at regional, national and European level and that is adapted to the specific needs of the Spanish health system.

The Spanish military healthcare network uses telemedicine for daily consultations between their hospitals and to support Navy ships and displaced military units. In the civil sphere, the use of telemedicine is comparatively less developed. However, since 2006, through the Avanza Plan, the government has encouraged Telemedicine initiatives in the communities; therefore developments are occurring at a regional level.

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1   Introduction to the report

1.1   Motivation of the eHealth Strategies study

Following the *Communication* of the European Commission (EC) on "eHealth – making healthcare better for European citizens: An action plan for a European eHealth Area",[1] Member States of the European Union (EU) have committed themselves to develop and issue national roadmaps – national strategies and plans for the deployment of eHealth applications addressing policy actions identified in the European eHealth Action Plan.

The *2004 eHealth Action Plan* required the Commission to *regularly monitor* the state of the art in deployment of eHealth, the progress made in agreeing on and updating national eHealth Roadmaps, and to facilitate the exchange of good practices. Furthermore, in December 2006 the EU Competitiveness Council agreed to launch the *Lead Market Initiative*[2] as a new policy approach aiming at the creation of markets with high economic and social value, in which European companies could develop a globally leading role. Following this impetus, the Roadmap for implementation of the "eHealth Task Force Lead Market Initiative" also identified better coordination and exchange of good practices in eHealth as a way to reduce market fragmentation and lack of interoperability.[3]

On the more specific aspects of electronic health record (EHR) systems, the recent *EC Recommendation on cross-border interoperability of electronic health record systems*[4] notes under "Monitoring and Evaluation", that "in order to ensure monitoring and evaluation of cross-border interoperability of electronic health record systems, Member States should: consider the possibilities for setting up a monitoring observatory for interoperability of electronic health record systems in the Community to monitor, benchmark and assess progress on technical and semantic interoperability for successful implementation of electronic health record systems." The present study certainly is a contribution to monitoring the progress made in establishing national/regional EHR systems in Member States. It also provides analytical information and support to current efforts by the European Large Scale Pilot (LSP) on cross-border Patient Summary and ePrescription services, the epSOS - European patients Smart Open Services - project.[5] With the involvement of almost all Member States, its goal is to define and implement a European wide standard for such applications at the interface between national health systems.

Earlier, in line with the requirement to "regularly monitor the state of the art in deployment of eHealth", the EC already funded a first project to map national eHealth strategies – the eHealth ERA "Towards the establishment of a European eHealth Research Area" (FP6 Coordination Action)[6] - and a project on "Good eHealth: Study on the exchange of good practices in eHealth"[7] mapping good practices in Europe - both of which provided valuable

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[1] European Commission 2004

[2] European Commission 2007

[3] European Communities 2007

[4] European Commission 2008

[5] Smart Open Services for European Patients

[6] empirica 2006

[7] European Commission; Information Society and Media Directorate-General 2009

input to the present *eHealth Strategies* work and its reports. Member States' representatives and eHealth stakeholders, e.g. in the context of the *i2010 Subgroup on eHealth* and the annual European High Level eHealth Conferences have underlined the importance of this work and the need to maintain it updated to continue to benefit from it.

This country report on Spain summarises main findings and an assessment of progress made towards realising key objectives of the eHealth Action Plan. It presents lessons learned from the national eHealth programme, planning and implementation efforts and provides an outlook on future developments.

1.2   Survey methodology

After developing an overall conceptual approach and establishing a comprehensive analytical framework, national level information was provided for Spain by "Proyectalis". Proyectalis is a consulting, outsourcing and training firm providing advanced project management services and solutions in southern Spain.[8] Relevant information on policy contexts and health system situation, policies and initiatives as well as examples for specific applications was collected by the overall project lead - empirica in Bonn, Germany

The key tool to collect this information from correspondents was an online survey template containing six main sections:

A. National eHealth Strategy

B. eHealth Implementations

C. Legal and Regulatory Facilitators

D. Administrative and Process Support

E. Financing and Reimbursement Issues

F. Evaluation

Under each section, specific questions were formulated and combined with free text fields and drop-down menus. The drop-down menus were designed to capture dates and stages of development (planning/implementation/routine operation). In addition, drop-down menus were designed to limit the number of possible answering options, for example with regard to specific telemedicine services or issues included in a strategy document. The overall purpose was to assure as much consistency as reasonably possible when comparing developments in different countries, in spite of the well-know disparity of European national and regional health system structures and services.

Under Section B on eHealth implementation, questions regarding the following applications were formulated: existence and deployment of patient and healthcare provider identifiers, eCards, patient summary, ePrescription, standards as well as telemonitoring and telecare.

The data and information gathering followed a multi-stage approach. In order to create a *baseline* for the progress assessment, the empirica team filled in those parts of the respective questions dealing with the state of affairs about 3 to 4 years ago, thereby drawing on data from earlier eHealth ERA reports, case studies, etc. to the extent meaningfully possible. In the next step, national correspondents respectively partners from

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[8]   Proyectalis 2010

the study team filled in the template on recent developments in the healthcare sector of the corresponding country. These results were checked, further improved and validated by independent experts whenever possible.

Progress of eHealth in Spain is described in chapter 3 of this report in the respective thematic subsections. The graphical illustrations presented there deliberately focus on key items on the progress timeline and cannot reflect all activities undertaken.

This report was subjected to both an internal and an external quality review process. Nevertheless, the document may not fully reflect the real situation and the analysis may not be exhaustive due to focusing on European policy priorities as well as due to limited study resources, and the consequent need for preferentially describing certain activities over others. Also, the views of those who helped to collect, interpret and validate contents may have had an impact.

1.3   Outline

At the outset and as an introduction, the report provides in chapter 2 general background information on the *Spanish* healthcare system. It is concerned with the overall system setting, such as decision making bodies, healthcare service providers and health indicator data.

Chapter 3 presents the current situation of selected key eHealth developments based on detailed analyses of available documents and other information by national correspondents and data gathered by them through a well-structured online questionnaire. It touches on issues and challenges around eHealth policy activities, administrative and organisational structure, the deployment of selected eHealth applications, technical aspects of their implementation, legal and regulatory facilitators, financing and reimbursement issues, and finally evaluation results, plans, and activities

The report finishes with a short outlook.

2   Healthcare system setting

2.1   Country introduction[9]

Spain is a parliamentary monarchy. Executive power is exercised by the President of the Government and the Council of Ministers. Spain has decentralised its administration and, nowadays, is divided into 17 autonomous communities, plus two autonomous cities (Ceuta and Melilla), which have competences in many areas. In this process, responsibility for most administrative services has been transferred to the regional level.

The Spanish health system is based on the principle that all citizens have the right to health, regardless of their economic and employment situation. The State is responsible for guaranteeing this right, by providing resources from the central budget. Apart from that, the Spanish health system has two levels of organisation: the central and regional health services. The main body of the central administration is the Ministry of Health. The Ministry

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[9] Evidence-based support for the design and delivery of user-centred online public services

is in charge of the proposals and implementation of the Government's general guidelines about health policies. The regional organisation of health services is the responsibility of the autonomous Regions. The health planning must be based on the central administration policies, and each Region is required to have its own health centre. Local health services are the fundamental structures of the Spanish health system. They are responsible for the unitary management of the health centres and institutions within each autonomous Region.

> **Key facts about the Spanish healthcare system:**[10]
>
> Life expectancy at birth: 80.4 years
>
> Healthcare Expenditure as % of GDP: 8.5% (OECD 2007)
>
> WHO Ranking of Healthcare systems: rank 7
>
> Public sector healthcare expenditure as % of total healthcare expenditure: 71.8% (OECD 2007)

2.2   Healthcare governance[11]

Decision making bodies, responsibilities, sharing of power

The central government is responsible for promoting coordination and cooperation in the health sector. The Spanish Ministry of Health and Consumer Social Policy (MoH) plays the role of the primary policy decision maker by establishing nationally valid standards and requirements for healthcare provision. E.g. its strategic responsibilities comprise: definition of the benefits package covered by the National Health Service (NHS); regulations regarding pharmaceutical policy; and regulation of education in the health field. Further tasks include regulations of the financing system and regulation of the financial aspects of social security. It enacts laws regarding the healthcare system and coordinates between the autonomous communities and national bodies responsible for health issues. Furthermore the MoH is responsible for inter-territorial and international health issues.

With reference to particular healthcare system issues, the MoH shares responsibilities with other national and regional bodies: Regarding many financial matters approval of the social security system and/or the Ministry of Economy and Finance is still required. Furthermore the Ministry of Public Administration regulates many issues linked to personnel.

Although the MoH is the primary health policy decision body, it more and more shares its regulatory power with regional governments. Concerning those responsibilities that partly have been transferred from the central government to the regional government, there exists no hierarchy between the central government and the regional governments. Decisions of the CISNS (Consejo Interterritorial del Sistema Nacional de Salud) aiming at coherent policy across autonomous communities are similar to recommendations as they must be adopted consensually. Sometimes, the two parties at both regional and national level can sign "agreements" fixing obligations for both sides.

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[10] Data from World Health Organization 2000; Health Consumer Powerhouse 2008; World Health Organization 2009

[11] Rico, Sabes et al. 2000

Representatives of the autonomous communities and the state administration constitute the inter-territorial council (Consejo Interterritorial del Sistema Nacional de Salud – CISNS). This council aims to guaranteeing cohesiveness across all regions.

Since the Cohesion and Quality Act adopted in 2003 the CISNS is composed of the Minister of Health and Consumer Affairs and the ministers responsible for health issues at regional level. Additional members of the central government or the regions can join CISNS discussions on specific topics by appointment of the members.

Healthcare service providers

Since 1986 (namely since the General Health Act of 1986) primary healthcare plays an independent and substantiated role in the Spanish healthcare system. This sector is predominantly publicly funded and run.

Primary healthcare centres and multidisciplinary teams provide personal and public health services (single-handed practices are restricted to small towns and to the private sector). GPs are meant to be the first point of contact and gatekeeper in the health system and solve more than 80% of the Citizens health problems. Traditionally practitioners have been working part-time and by themselves. Since 1990 the majority of the autonomous communities have shifted to a team working full-time model, in which the GPs are paid for on a salaried basis.

In Spain public health services are linked closely to primary healthcare. E.g. integration of all public health responsibilities at the regional governmental level has led to the coordination and management of epidemiological surveillance, provision of preventive medicine and health promotion at regional level. GPs and practice nurses carry out these public health services within their normal workflow.

In 2007, most of the Spanish hospitals were publicly owned. Furthermore there existed an extensive network of outpatient ambulatory centres. In those, members of specialist teams of clinical departments cover outpatient care in ambulatory centres on rotation.

Figure 1: Important features of primary healthcare organisation in Spain

Political/administrative unit responsible for primary healthcare	Health service provision at regional level.
Consumer Choice	There are some differences among the different regions, but in general, there is a free choice of GP, with some restrictions, related to location of the health centre in relation to the patient house/place of work, the number of changes or the time between changes and the GP has a limit in assigned patients, too.
Financing	Public budget, mainly tax-based.
Public or private providers	Publicly employed primary care providers.
Gatekeeping function of the GP	GPs are the first contact point, the do have a gatekeeping function and solve most of the problems.
Integrating health: initiatives for coordination	There is a National Health System. Every worker is affiliated; there is another option for some kinds of professionals (such as teachers or doctors). But it has coverage for everybody. Patients can contract private individual health plans, but not related to social national healthcare.

2.3 Recent reforms and priorities of health system/public health

Currently ongoing reforms in the health and social care systems[12]

Reforms of the Spanish healthcare system since 1986 have focused on universal coverage, primary healthcare, financing and management.

- The Spanish system has largely been decentralised to the autonomous communities.
- Major comprehensiveness of the public health services network and transition from a social security system to a tax-funded system has lead to favourable results.
- The aims of cost-containment and rationalisation of financing and management structures have been targeted. The focus of reforms during the 1980s was on rationalisation of the system, while during the 1990s it laid on more efficient management structures, and competition. Since 2001 the relevance of governance and clinical management was stressed

The reform of the model is still in the process of negotiation between the central government and the regional ones. Even though no reform has addressed this aspect up to now, it is expected that more resources will be devoted to the regional authorities. This is a very important issue for regional authorities, since health expenditures are one of the main components of their expenditure budgets. It is expected that the revision on health

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[12] Prieto 2004

financing will be accompanied by a revision of the general system of financing of regional governments, in which the health budget is included.

Healthcare decentralisation in 2003 and 2004 has driven to a somehow more stringent budget, a bit less euphoric than in the previous exercise (2002); this is due to the fact that many regions have begun to experience their first financial difficulties, mainly due to the increase of the pharmaceutical invoice that is still at high levels.

Another element to notice is the increase in personnel's expenditures in almost all regions, being a consequence of labour-unions' pressures to obtain better labour conditions (e.g. to become "statutory" professionals, which is something like civil servants; see report on "New legislation of health professional careers, training and working conditions", 2004), agreed upon by taking advantage of the decentralisation process and the political component of demonstration of its autonomy in healthcare administration.

Another cause of the increase of the healthcare expenditures in the last years is the increase in the number of people covered by the system, bound closely to the population's evolution, but not all covered population is considered in the model.

2.4   ICT use among general practitioners

This section provides a brief overview of relevant ICT related infrastructure and services data. It draws on earlier studies commissioned by the EC, notably the Indicators eHealth Study . Although the results of this study date from 2007 and may therefore not reflect latest changes, a more recent pan-European survey is not available[13] *.*

77% of the Spanish GP practices use a computer. 51% of the Spanish GP practices are connected to the Internet and only 36% of the GP practices use a broadband connection.

The storage of electronic patient data is only moderately common in Spain. At least one type of individual data is stored in 71% of GP practices.

A computer is available in the consultation room of 74% of the Spanish GP practices. 95% of Spanish GPs actually use this computer for consultation purposes with the patients. Here it could for instance be used to display a patient's file to the practitioner, to explain medical issues to the patient by means of a photo or animation but also to run a decision support system helping in diagnosis or prescribing. A Decision Support System is used by 42% of the Spanish GP practices.

In Spain the electronic exchange of patient data is not yet very common, neither for administrative data nor as far as medical data is concerned.

6% of the Spanish GPs exchange administrative data with other care providers. This compares to an average rate of 10% reached in the EU27. 91% of primary healthcare centres are connected to their respective corporate networks.[14]30% of the Spanish GP practices receive results from laboratories electronically via Internet of other dedicated networks. 13% of the GP practices exchange medical data with other healthcare providers.

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[13] ICT and eHealth use among General Practitioners in Europe 2007

[14] Ministry of Health and Social Policy; 2010

The electronic exchange of prescriptions, commonly referred to as ePrescribing, is used by 18% of GP practices in Spain. These services are now available in Andalusia, the Balearic Islands and Extremadura. Five other regions, Canary Islands, Catalonia, Galicia, the Valencia Autonomous Region, and the Basque country, are expanding this service[15].

Figure 2: eHealth Use by GPs in Spain
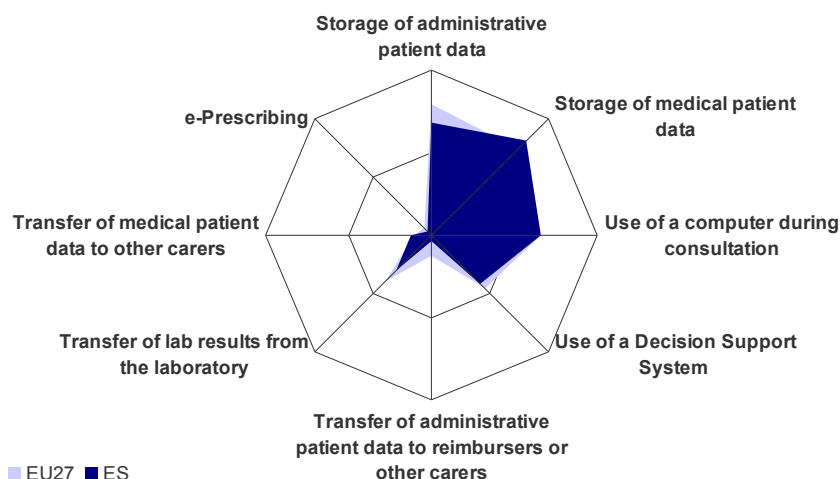
Indicators: Compound indicators of eHealth use (cf. annex for more information), % values. Source: empirica, Pilot on eHealth Indicators, 2007.[16]

3   eHealth Strategies survey results

The following sections present the results of the eHealth Strategies country study. In a first section, the eHealth policy actions undertaken in Spain are presented. This is followed by a presentation of administrative and organisational measures taken. Section 3.3 presents results on key eHealth applications. Section 3.4 focuses on the technical side of eHealth, namely the role of patient and healthcare provider identifiers and the role of eCards. Legal and regulatory facilitators as well as financing and reimbursement issues are presented sections, 3.5 and 3.6. The report concludes with evaluation activities (3.7) in the country and an outlook (4).

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[15]   Ministry of Health and Social Policy; 2010

[16]   The notion of „compound indicator"designates an indicator build from a set of other indicators/survey questions regarding the same topic. The compound indicator reflects an average calculated from different values. The final results of the study on eHealth Indicators is available at www.ehealth-indicators.eu

3.1 eHealth policy action

The eHealth strategies of EU and EEA countries are not always classified as strategies by the countries themselves. Some countries may indeed publish a policy document which refers to the ICT strategy in the healthcare sector. Other countries such as France and Germany have enshrined the central eHealth activities in legislation that governs the healthcare sector. In Germany, the relevant law is the law on the modernisation of healthcare; in France the introduction of an electronic medical record is included in a law concerning social security.

Sometimes documents from domains such as eGovernment strategies or Information Society strategies may contain provisions which concern eHealth. In cases where the healthcare system is decentralised, i.e. where power is delegated to the regional level, regional authorities may even publish strategy documents regarding eHealth.

3.1.1 Current strategy/roadmap

In Spain, the government launched two plans to boost the development of e-Government services, containing specific provisions concerning eHealth in 2006.

Quality Plan for the National Health System

The first plan is the Quality Plan for the National Health System, developed and presented by the Ministry of Health.[17] The main objective of this plan is to respond to the challenges faced by the national health system. By targeting six major areas of performance, the strategy aims to provide the citizens with assistance of the highest quality by making use of information technology.

The areas included are:

1. Protection, health promotion and prevention
2. Promoting equity
3. Supporting healthcare human resources planning
4. Promoting clinical excellence
5. Using information technologies to improve GP appointments for citizens
6. Increasing transparency

Overall, the Quality Plan for the NHS sets out common lines of action in its bid to extend to the whole of the NHS the services available within each province. The strategy covers primary care and secondary care services as well as medical devices, most basic levels of assistance to structures and more complex devices. In sum, the Ministry of Health is taking action in two areas: on the one hand it cooperates with the autonomous communities to support their initiatives for the development and implementation on four areas agreed upon with the Spanish regions (see below) and on the other hand, it induces and puts in place the necessary elements to enable these systems to be interoperable with each other in the field of the National Health System and internationally.

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[17] Ministerio de Sanidad y Consumo 2006

The second plan is the Plan Avanza[18], which is included in the national strategy to boost research, development and innovation, the Ingenio Programme 2010. Through the Plan Avanza the Spanish government hopes to further develop the Knowledge Society by modernising public services and promoting the expansion of broadband infrastructure. With regards to healthcare the plan contains a section called "Sanidad en Linéa". It foresees more specifically the implementation of PCs and other devices such as e.g printers, servers, diagnosis screens for both administrative and medical purposes. The so called "Health on-line Programme" also included in the Plan Avanza, provides furthermore subsidies for technological infrastructure for health centres and regional central services. In the meantime Plan Avanza 2 (2009-2012) has been launched, aiming to consolidate the use of ICT in strategic sectors. The focus is now on the support of SMEs (Small and Medium Enterprises) and in connection with that support Spain's economic recovery.

Key features of the Avanza Plan in the domain of health are summarised in the following box:

> ### Sanidad en Linéa – part of the Avanza Plan[19]
>
> Aiming to support the implementation of projects, such as Digital medical records, ePrescribing, the doctor's appointment system, etc. with special focus in guarantying interoperability in the National Helath System: regional health cards, digital medical records and ePrescripbing systems.
>
> Participants are the autonomous Regions through their Departments of Health and the Institute of Health Management (INGESA) --> link between the National Avanza Plan and the autonomous Regions, as well as Red.es
>
> Budget for the period 2009-12: €196 million
>
> Aiming to connect the regional healthcare system: over 60.000 PCs in more than 6200 health centres, benefiting 33.5 million people and 253.000 professionals
>
> Service development: interoperable health card, electronic prescription, digital medical records, online appointments

The plan is part of a larger quality enhancement strategy in the healthcare system. It is pursuing the following objectives[20]:

- Guarantee the unique identification of all citizens across Spain through the health insurance card and the protected population database of the National Health Service.

- Launch an electronic health record containing clinical information, with the possibility to exchange information between different professionals and social assistance services across different autonomous communities.

- Extend the ePrescription services into the National Health System.

- Offer new interactive services between citizens and healthcare professionals such as websites, telemedicine and tele-education services in the framework of the National Health Service

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[18] Developed jointly by the Ministry for Telecommunications and the Information Society, the Ministry of Industry, Tourism and Trade and Red.es, the entity within this ministry responsible for driving the Information Society in Spain, for more information, see: www.planavanza.es.

[19] OECD 2009

[20] Ministerio de Sanidad y Política Social [Ministry of Health and Social Policy]

- Guarantee the accessibility and appropriate exploitation of health related data from any healthcare provision point in the system.

Lines of Action for regional health improvement

On the regional level most of the autonomous communities have their own documents, but in the past 15 years, the National Health Service (NHS) has developed initiatives to improve the regional accessibility and alignment of its services. For that purpose, autonomic Health Services have been working in different lines of action in relation to information technology and although there is some diversity in their actions, there is full agreement on four main lines of action in all regions:

- Guarantee the accessibility and appropriate exploitation of health related data from any healthcare provision point in the system.

- A reliable system of identification of users (individual health insurance card);

- The computerisation of clinical records of each user or patient (history digital);

- A system to support all the processes necessary for the electronic prescription to patients and users (prescription, approval, supply);

- Mechanisms to help streamline the citation of users with primary care physicians and specialists in the area, and treatment devices avoiding travel distance (telemedicine).

On this note, different regions have developed roadmaps for health. For example the Balearic Islands and Valencia have an unified electronic medical record that allows access to all their healthcare professional to the relevant clinical information of all their citizens, in Andalusia, the Second Quality Plan for the Andalusian Public Health System 2005-2008 includes references to the design of corporate strategies for teleservices and telemedicine, and the integration of information systems and the "Single Digital Medical Record" ("Historia clínica digital única").

Regional strategies for eHealth

In Catalonia there is a Strategic Plan for the ICT in Health in Catalonia (2008-2011) ("Plan Estratégo SITIC para ámbito de la Salud en Cataluña 2008-2011"). It consists of six strategic lines and 40 lines of action which group implementation, targets, indicators timeframes and budgets that guide action in the development of the strategy and, therefore, the incorporation of the ICT sector as a key element in the coming years.

The Basque Country includes in its "Plan Euskadi" for the Information Society (PESI II), solutions that help to improve the quality of care for citizens with a special focus on health.

Galicia, as the last regional example, developed the "Plan of Information Technology for 2006-2009", which defines plans for action and emphasises different significant investments.

A summary of key policy documents related to eHealth is presented in Figure 3 below.

Figure 3: Spanish Policy Documents related to eHealth
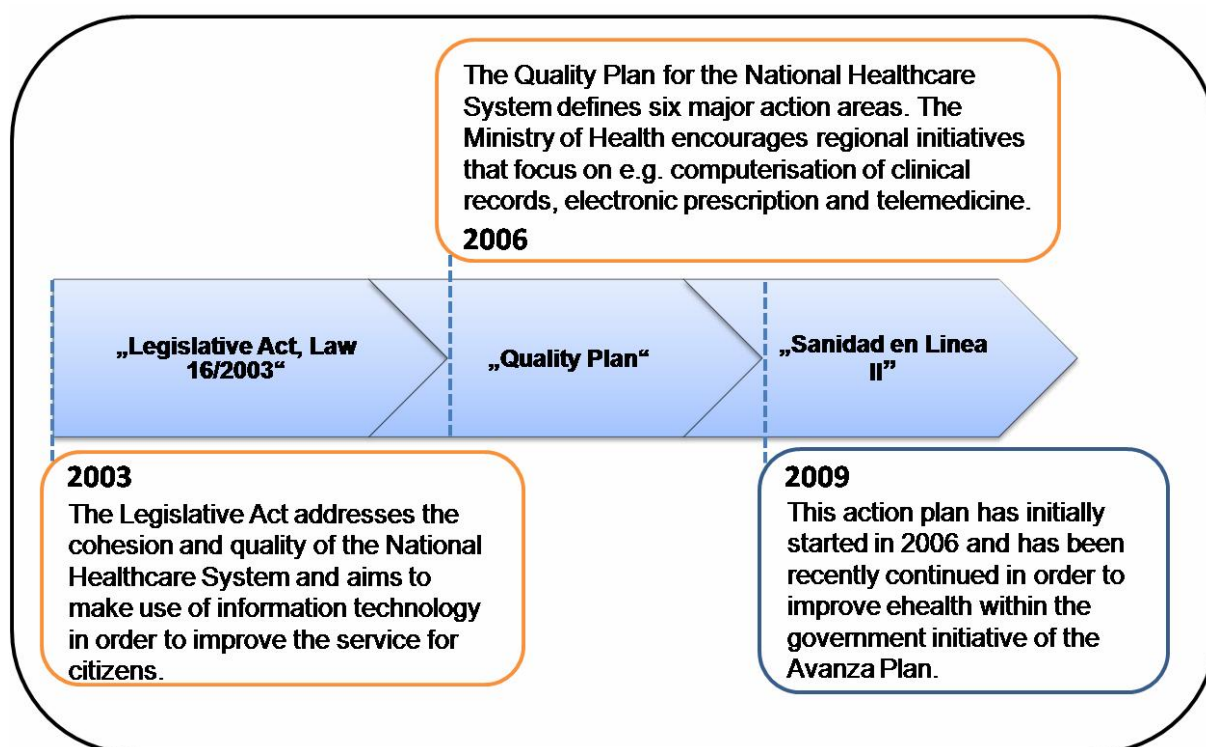
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3.2 Administrative and organisational structure

Ministry of Health and the Quality Agency of the NHS

The Spanish Ministry of Health is responsible for ensuring interoperability, data flow of health records and electronic prescriptions between regions and through the Health Intranet and the day-to-day running of the infrastructure. It also hosts the national information nod. Additionally, the Quality Agency of the National Health Service, which was established by the Ministry of Health, coordinates all autonomous regions. In addition, every region has its own institution.

Group of Technolo-gy Standards and Technical Requirem-ents (GERT)

In terms of health technology standards, the Group of Technology Standards and Technical Requirements (GERT) was created at the end of 2007. It compromises representatives of all Health Services of the autonomous communities and aims at reaching an agreement on adopting a policy of standards throughout the National Health System. Additionally, the Semantic Interoperability Group for Medical Records (GAISHC) has started its operation in the last quarter of 2007. Its purpose is to issue reports to enable the National Health System to make decisions and pass resolutions to solve the semantic interoperability of the medical record system in the area of the NHS. On the national level, the Quality Agency of the National Health Service – from the Ministry of Health – oversees the development of standards, but each autonomous community has the right to decide which standard to use.

3.3 Deployment of eHealth applications

3.3.1 Patient summary and electronic health record (EHR)

In this study, the epSOS project's definition[21] of a patient summary was used as a general guideline. There a patient summary is defined as a minimum set of a patient's data which would provide a health professional with essential information needed in case of unexpected or unscheduled care (e.g. emergency, accident), but also in case of planned care (e.g. after a relocation, cross-organisational care path).

Lacking a standard definition, a patient's electronic health record (EHR) is here understood as an integrated or also interlinked (virtual) record of ALL his/her health-related data independent of when, where and by whom the data were recorded. In other words, it is an account of his diverse encounters with the health system as recorded in patient or medical records (EPR or EMR) maintained by various providers like GP, specialists, hospitals, laboratories, pharmacies etc. Such records may contain a patient summary as a subset. As of yet, fully-fledged EHR systems rarely exist, e.g. in regional health systems like Andalucia in Spain or Kronoberg in Sweden, or in HMOs (health maintenance organisations) like Kaiser Permanente in the USA.

It should be noted that in most policy documents reference is made simply to an "EHR" without any explanation of what is meant by it, thereby in reality even a single, basic electronic clinical record of a few recent health data may qualify. As a consequence, this section can only report on national activities connected to this wide variety of health-related records without being able to clearly pinpoint what (final) development stage is actually aimed for or has been reached so far.

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Electronic medical record pilots

In Spain, the field of an "electronic medical record" has been prioritised during the recent years: In 2007, there was an agreement between professionals to share all data sets and the analysis of requirements for a medical record system for the National Health System that will enable data exchange. The data model was studied and approved by the Ministries of Health of all communities and the Subcommittee on Information Systems, receiving approval from the Inter-Territorial Council of the National Health Service in December 2007, for a piloting of this system of exchange. During the last quarter of 2007, the Group of Autonomous Communities taking part in the medical record pilot (GCPHC) was formed. Currently there are 9 regions participating in a pilot study where access to various electronic documents through the national switching point (including the patient summary) is tested. The pilot is being carried out since 2008 and the deployment is planned to start in 2011. This deployment will be related to the evaluation of the pilots and

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[21] European Patients Smart and Open Services (epSOS)

incorporation of international standards as well as active participation in European interoperability projects[22].

Regional electronic medical records

At regional level, there are different electronic medical records in most communities, each with its own characteristics. In most cases, there is full access to the regional digital medical records of the patient's primary care, but the ability to access this information from specialised medical centres is lower. The functionalities most of the regional digital histories hold are: electronic medication record, GP record, medical history, discharge letter, laboratory results, radiology reports and emergency care data.

For future developments, the National Health Ministry and the autonomous communities planned further cohesion in June 2009: The Inter-Territorial Council approved regulates the Minimum Data Set for clinical reports to be collected in clinical documents needed to develop the digital records of the NHS. This dataset has been agreed upon with the communities and with medical societies and nursing. Recently this technical agreement has been approved as a royal decree by the national government.

The minimum set of data will be incorporated into electronic documents that form the basis of the digital records of the NHS. These are:

- The hospital discharge report
- The specialty consultation report
- The report of emergency care
- The report of primary care consultation
- The report of laboratory test results
- The report of results of imaging tests
- The report of nursing care
- The medical history summary

The definition of these minimum data contents for the National Health System does not prevent each autonomous community from expanding each of the reporting health data sets as far as they think necessary. In July 2009, a total of 10 autonomous communities have initiated pilot projects for the deployment of the "historia clinica digital" (electronic clinical record) of the National Health System. These are Andalucia, Baleares, Cantabria, Castilla-La Mancha, Castilla Leon, Catalonia, Comunidad Valenciana, Extremadura, La Rioja and Murcia.

**Challenge for Spanish electronic medical records**

As a main challenge to further progress, accessibility has been identified, in particular public access to health data by electronic means from their own or their constituents, which are available in digital form in any of the Health Services that are integrated into the National Health System. This electronic access must meet the minimum safety requirements established to protect their data against illegitimate intrusion of those who have not been authorised to access.

This authorisation leads to another difficulty, as it is a challenge to ensure that the healthcare professional is authorised by each Health Service and in each case by the patient. Above all, it is challenging to provide access to health data sets generated in other

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[22] Ministry of Health and Social Policy 2009

communities – different from the one where the information is required – whenever patient or professional demands this service.

Figure 4: Patient Summary in Spain

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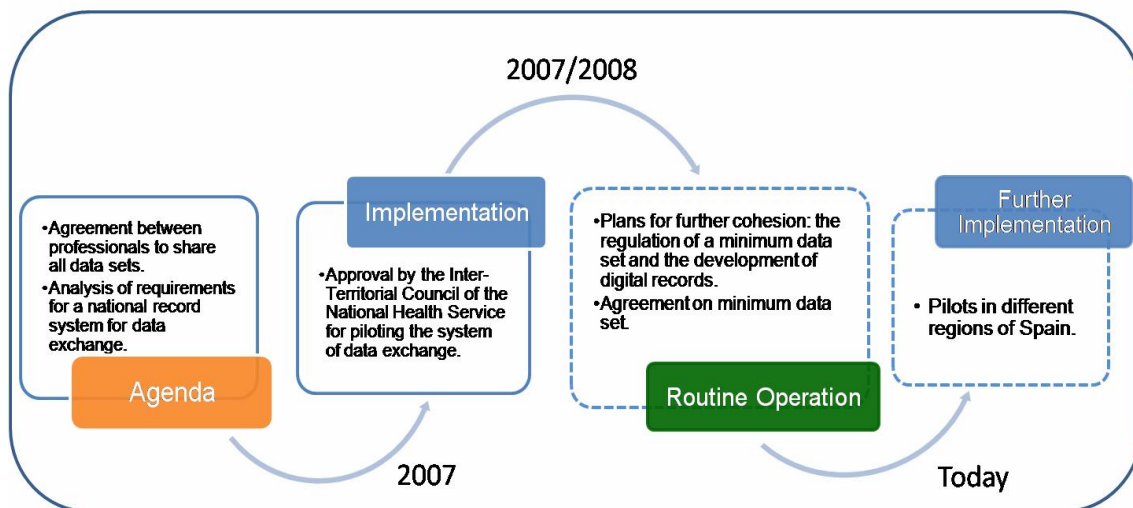
3.3.2 ePrescription

In the framework of this study and following work in epSOS[23], ePrescription is understood as the process of the electronic transfer of a prescription by a healthcare provider to a pharmacy for retrieval of the drug by the patient. In this strict sense, only few European countries can claim to have implemented a fully operational ePrescription service.

Regional routine use of ePrescript-ion

The electronic transmission of prescriptions to pharmacies is regional routine in Spain. Since the Law of 29/2006 on the Use of Medicines[24], physicians and dentists are allowed to prescribe medicines with public and private prescriptions and with pharmaceutical prescriptions in the ambulant context. These prescriptions can be printed, but can also be stored and – in time – accessed electronically from any dispensation point in Spain. The law states that is the task of the government to set up the general framework of minimum requirements to medical prescriptions issued or edited in a computer device[25].

Especially Andalusia has an advanced system through the so-called "Receta XXI" project. Other regions that have implemented ePrescription are the Balearic Islands and Extremadura. For these, the ePrescription take-up is developing towards 20 to 50%: In Andalusia, in September 2008, 46% of prescriptions were electronic. In Cordoba, in July 2009, 50.34% were conducted through electronic prescribing. In Malaga in July 2009, 56.3% were conducted through

Spanish Regions	ePrescription take-up
Malaga	56.3% (2009)
Balearic Islands	53.46% (2008)
Cordoba	50.34% (2009)
Extremadura	50.3% (2009)
Andalusia	46% (2008)
Almeria	41% (2009)
Mallorca	14.12% (2008)
Menorca	3.04% (2008)
Castile-La Mancha	Pilot projects in operation

electronic prescribing. In Almeria, in September 2009, 41% were conducted through electronic prescribing.

The Balearic Islands had a take-up of ePrescription of 53.46% in October 2008, as well as Ibiza-Formentera, where the use of electronic prescriptions began in September 2006. On Mallorca, where the use of electronic prescriptions began in April 2008, 14.12% of prescriptions were electronic. In Menorca, where the use of electronic prescriptions began in October 2008, 3.04% of prescriptions were electronic. In Extremadura, in July 2009, 50.3% of prescriptions were electronic.

Valencia, Catalonia, Basque Country, Canary Islands and Galicia are working on the deployment of its models in health centres and pharmacies. Aragon and Castile-La Mancha have pilot projects operating, Madrid is being improved after its pilot, and Navarra, Cantabria, Murcia, Ceuta and Melilla are preparing piloting.

In addition, Red.es (Ministry of Industry, Trade and Tourism) is collaborating with Murcia and Cantabria in the development of electronic prescribing solutions.

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[23] European Patients Smart and Open Services (epSOS)

[24] Law 29/2006 of Guaranteed and Rational Use of Medicines and Sanitary Products.

[25] Art 77 Law 29/2006

Challenge of uneven ePrescript-ion roll out

Today, the uneven implementation of electronic prescription within Spain is challenging and must be followed by an interoperability sponsored by the Ministry of Health. An appropriate agreement is needed to extend this development from 2009 to 2012, which should be signed by the Ministry of Health, the Ministry of Industry, Tourism and Trade – through its Secretary of State for Telecommunications and Public Enterprise Red.es. Thus, the priorities for the coming years, as agreed by regional communities through the Inter-Territorial Council of the National Health System would be:

- The electronic health record;

- Development and implementation of digital records in the National Health System (HCDSNS: Historia Clinica Digital del Servicio Nacional de Salud);

- The introduction and extension of electronic prescriptions; To equip all staff with the necessary tools to facilitate the implementation of solutions for interoperability;

- Ensure the availability of them

The Autonomous Communities which decide to join the project might do so through specific agreements with the Ministry, in a cohesive vision that seeks national implementation of the system in the European context.

Figure 5 below summarises developments in ePrescription in Spain over the past few years.

Figure 5: ePrescription progress in Spain
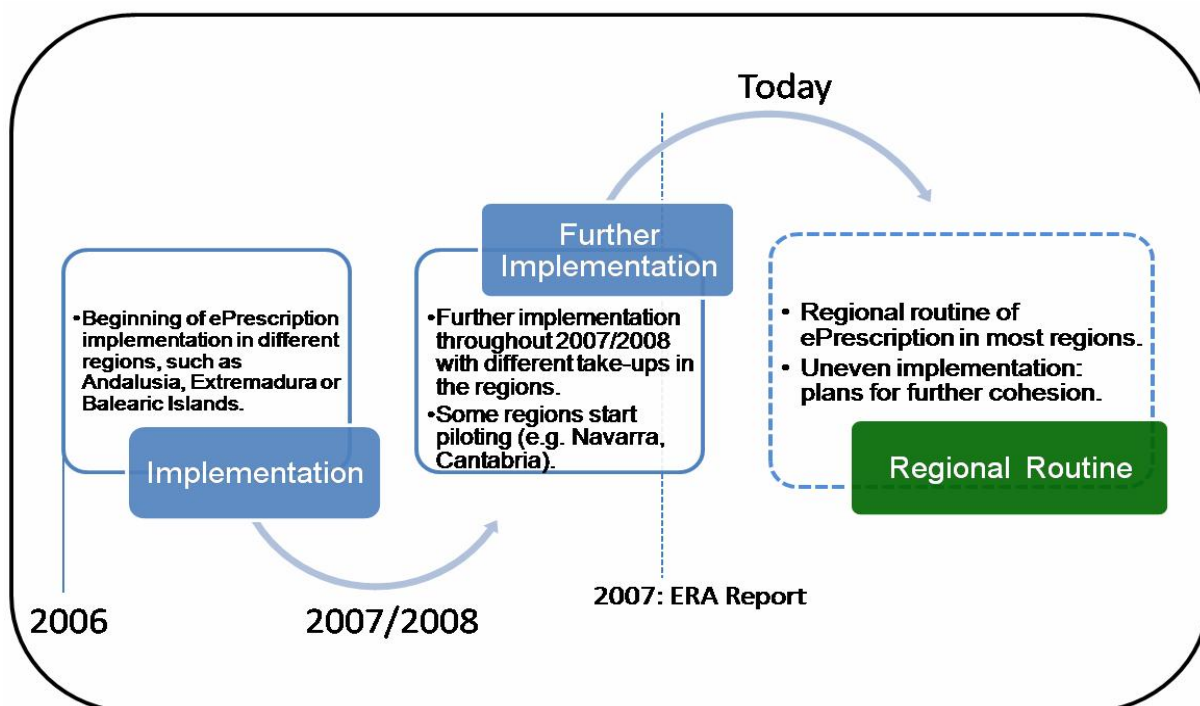
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3.3.3 Standards

Standards are not only crucial to enable interoperable exchange of meaningful information in the healthcare system; they also ensure secure access to patient records by healthcare providers and citizens. This study aims to identify, among other usage, standards related to the domain of health informatics, such as the SNOMED Clinical Terms or the LOINC terminology.

Spanish National Authority for Standards and the Ministry of Health

The Spanish National Authority for clinical standards is the Quality Agency of the National Health Service from the Ministry of Health. But each autonomous community has the right to decide which standard it uses.

The Ministry of Health is also the representative of Spain for the International Health Terminology Standards Development Organisation. Spain has been a member since July 2009. As IHTSDO member, the Ministry of Health assumes liability for the distribution of SNOMED CT within Spain and it will develop the national version, adapted to the specific needs of the Spanish health system.

The Institute of Health Information (that it is included in Quality Agency of the National Health Service) is in charge of undertaking initiatives aiming to develop SNOMED CT as the reference clinical terminology system for Electronic Health Records within the National Health System (EHRNHS). SNOMED CT is a standard for controlled clinical vocabulary to allow the automatic interpretation of the content transmitted between heterogeneous systems in an accurate way and in different languages.

Thereby, the adaptation of SNOMED CT has been one of the first goals defined through the semantic interoperability roadmap in Spain. From 2008 this work has been directed to follow a new guideline: to provide semantic services to all National Health System agents, which are needed to reach the full interoperability of the Electronic Health Record. The interoperability of the Electronic Health Record and the patient summary dataset has been an issue in Spain since 2007.

Data integration and use of standards is a basic concept in healthcare organisations in Spain. But though almost all communities have a strategy set related to standards, each region has set out different priority levels and has used different approaches.

In the region of Andalusia for example, though there is no hospital that has a complete implementation of a standard, most centres (63.64%) implement or support, in part, the HL7 standard. Specifically, in the 15 of them it has been partially implemented, what constitutes 45.45% of the centres, while the remaining 6 (18.18%) support it, but it is not implemented in their system. It is also necessary to note that 12 centres (36.34% of the total number of centres) do not support any standard of health information exchange at all.

In light of this situation, the main challenge concerning standards is to be able to coordinate all the autonomous communities in the use of common standards that allow interoperability at regional, national and European level.

3.3.4 Telemedicine

The use of telemedicine applications is recognised as beneficial to enable access to care from a distance and to reduce the number of GP visits or even inpatient admissions. Commission services define telemedicine as "the delivery of healthcare services through the use of Information and Communication Technologies (ICT) in a situation where the actors are not at the same location"[26]. In its recent communication on telemedicine for the benefit of patients, healthcare systems and society, the Commission re-emphasises the value of this technology for health system efficiency and the improvement of healthcare delivery[27].

The Spanish military healthcare network uses telemedicine for daily consultations between their hospitals and to support Navy ships and displaced military units. In the civil sphere, the use of telemedicine is – in comparison to the military use – yet underdeveloped. There is a national plan from the year 2000, but most programmes and initiatives are developed locally. Since 2006, through the Avanza Plan, the government has encouraged Telemedicine initiatives in the communities; therefore more recent regional plans have been developed, such as the "Plan estratégico de implmantación de Telemedicina en Andaluciá" or the "Plan de Telemedicina y Teleaistencia Médica en Cataluña".

Examples for the use of telemedicine in autonomous communities are:

Use of Telemedicine in Spanish communities

Teledermatology: Andalusia (Malaga, Seville), in the Balearics (Ibiza, Formentera)

Teleconsultation of Otolaryngology and Maxillofacial Surgery: Sevilla

Videoconferencing for management of renal patients: Cordoba

Online control of defibrillators: Malaga

Teleradiology: Cantabria

Telemedicine in Pathology: Madrid (video system that allows multiple pathologists to communicate and study the same sample)

Teleencefalografy (Tele-EEG) in real time: Calahorra, La Rioja

Videoconferencing for Urgent Care: in the Basque Country

Teleictus Net: Catalonia (telemedicine system to assess and treat acute stroke in community hospitals that do not have a neurological care service through remote assistance referral hospitals)

Teleophtalmology: La Rioja (a system of consultation via Internet between family physicians and specialistsin ophthalmology for the diagnosis of pathologies in the retina in diabetic patients)

Madrid, Galicia, Castilla León, Extremmadura and Andalusia have various programmes for telemedicine, which are mainly used to support primary care, emergency and interconsultation among specialists. Catalonia is one of the autonomous communities with

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[26] Europe's Information Society 2009

[27] European Commission 2008

a wider use of telemedicine. In 2008, there were reports of a 46.2% of organisations using telemedical applications[28].

There are also some telemedicine projects between patients and health professionals such as the "Eminnens Diabetes Project", a system that allows the exchange of clinical information between diabetic patients at home and health professionals.

Figure 6 below summarises key developments in Spanish telemedicine.

Figure 6: Telemedicine Services in Spain
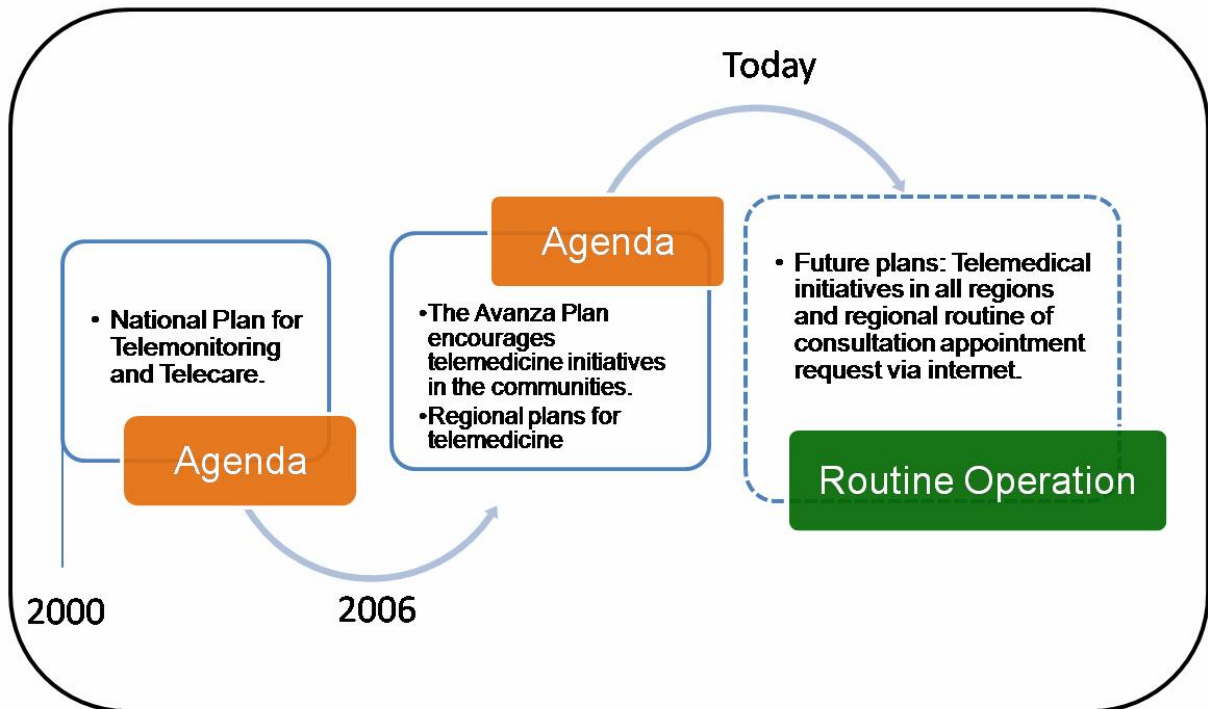
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3.4   Technical aspects of implementation

A key prerequisite for the establishment of an eHealth infrastructure is the ability to uniquely identify citizens/patients and healthcare professionals. This part of the survey deals with identifiers and how they are stored. This section does not deal with the tokens through which identification can or will take place. One such possibility would be via an eCard. This topic is dealt with in the following section. The current section focuses solely on whether or not unique identifiers are in place in your country and for which purpose.

3.4.1   Unique identification of patients

Individual health insurance card as ID document

The individual health insurance card[29] is the legally established ID document for the identification of every citizen in access and use of services in the Spanish National Health

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[28] Generalitat de Catalunya 2008

[29] Regulated by the Royal Decree 183/04 of 30 January 2004.

System. There is a specific ID assigned by each autonomous community, and there is a personal identification code for the National Health System. As soon as a citizen is included in the population database, he is assigned to an identification number. This acts as a key link among the possible various autonomic personal identification codes that a person can have throughout his life.

Both, the autonomous communities and the Ministry of Health provide databases that contain protected records of citizens. Individual health cards data is stored regionally (BDTSI-CA). Authorities in the communities are responsible for the inclusion persons in their territory and for processing the data (current and historical). The Ministry provides a common and national database of individual health cards (BDTSI-SNS) that collects information from the communities' database through a dataset – this set is basic, but sufficient to correctly to correctly identify every citizen and maintain his location and insurance status.

Personal ID code CIP-SNS

The personal identification code of the National Health System (CIP-SNS) has unique character and will be unique throughout the life of every person, regardless of the health authorities competent in their healthcare at all times. Furthermore, the identification code helps locating health information of a patient, which may be dispersed into the national health system, so that it can be located and assessed by health professionals. This procedure has to be consistent with the provisions of law, namely the Law 15/1999; Protection of Personal Data Act and Law 41/2002 (see section 4.5 on Legal and Regulatory Facilitators).

Currently, citizens of 15 autonomous communities and Ceuta and Melilla have the unique identifier system and there is work in progress to extend the project to the remaining two communities.

Challenge for unique patient ID

Challenging issues for the unique identification of patients are: one the one hand, each citizen must be assigned to a unique Personal Identification Code for all National Health Systems in the communities; the autonomous communities on the other hand must have a fully operational system of data exchange between their databases and the database of the national health system, which will hold the information on the citizens.

3.4.2 Unique identification of healthcare professionals

For healthcare professionals the establishment of a National Register of Specialists in Health Science is in a planning stage since 2003. Up to now, the Law of Health Professions, Law 44/2003, has been adopted.

In March 2007, the plenary of the National Human Resources Committee of the National Health Service, agreed to propose the creation of a register of health professionals in the NHS to the Inter-Territorial Council. This record is planned to permit the use of the information it contains. It also holds a treatment data set, which will be digitised and synchronised with the NHS Information System.

The register will contain sensitive data and is therefore subject to the Law 15/99 on the Protection of personal data (see section 4.5 on Legal and Regulatory Facilitators). It is also supposed to ensure access for citizens. By November 2008 almost all regional governments had a draft of legislation to control these records and Andalusia has published it in its official bulletin.

To fully implement this project, each autonomous community has to create its own record with the common minimum data set that will later be integrated into the NHS Information System. This will include the National Register of specialists in training and with specific training diplomas, the registration of accredited training for specialists (these three operated by the Ministry) and national registry data from scientists in health (managed by the Ministry of Education, Culture and Sport). The Ministry of Health is planning to propose and agreement to give impetus to its creation to the autonomous communities, both in financial and technology terms. The allocated contribution from Ministry side would be two millions euros.

3.4.3 The role of eCards

Each autonomous community runs or is planning to run its own card. Spanish law specifies that the card must include basic data identifying the cardholder, information about his pharmaceutical benefits and the health service and agency responsible for healthcare. Whatever device is incorporated to store basic information and applications, it should allow the reading and verification of data throughout the whole country.

In order to identify every citizen in a secure way, the law regulates that the Ministry of Health has to generate a unique personal identification code by developing a database to collect basic information about users of the National Health System. In the end, every health service should have an exchange information service on the protected population, which can be maintained and updated autonomously.

Although the unique electronic health card is an old project, the authorities in Spain have not agreed on a homogeneous way of implementation – in fact, half of the communities supply different information. According to various data from health authorities in 2008, there are 7 data model different for the eCards in the 17 Regions, but the cover basically the same information. All of then have a readable identification number for each holder in the magnetic stripe

All regions now have eCards and a corresponding pilot of exchange of medical records, which was elaborated on in section 3.3.1 of this report. In April 2009, Extremadura presented a project for the implementation of a new health card. It incorporates a microprocessor which stores the user identification data and cryptographic keys to ensure security of information. It has a chip and a magnetic stripe, which is a new format that makes it possible to read data of other health services in the National Health System. The new health card also includes data on dependence. It will have a security mechanism in form of a password – without that password the user will not be able to access patient private information.

A card with additional purposes has the Basque Country region, where the so-called ONA provides access to other electronic provisions, such as tax returns and municipal services.

There is no national eCard for health professionals in Spain at this time. There are regional initiatives, for example in Extremadura in April 2009. This pilot is aiming to issue cards for health professionals who combine professional identification with a security code and identification of the health card. This will enable the transfer of data to be treated in a secure way, in both health centres and in the pharmacies.

The Organizatión Medica Colegial (OMC), which is the Spanish collegiate (federated) physicians association, plans to issue a card with digital certificate and electronic signature, which will certify the status of physicians, specialties and skills in presence and electronic manners, with secure access to telematic applications.

The main challenge for all kinds of eCards was achieving full interoperability of health cards among all autonomous communities. Regional eCards are now fully interoperable, using the central database of the Ministry that issue a unique number to all the citizens that link the regional numbers that the citizen can obtain when he/she move between the regions. Additionally, all devices store data in a way that makes it possible to read and verify information throughout the whole country.

Figure 7 below summarises the development of eCards in Spain, both for patients and healthcare professionals.

Figure 7: eCards in Spain
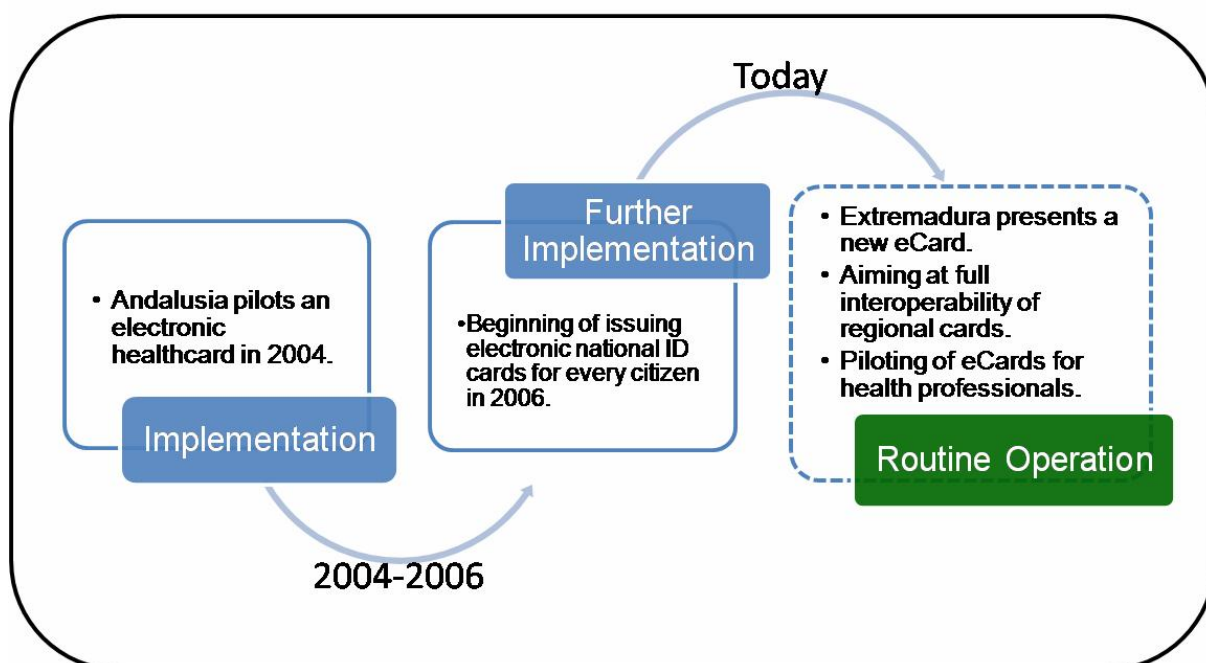
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3.5   Legal and regulatory facilitators

Important laws include personal data act, patient rights and quality regulation

Legal and regulatory issues are among the most challenging aspects of eHealth: privacy and confidentiality, liability and data-protection all need to be addressed in order to make eHealth applications possible. Rarely does a country have a coherent set of laws specifically designed to address eHealth. Instead, the eHealth phenomenon has to be addressed within the existing laws on professional liability, data protection etc.

In Spain the legal and regulatory field is characterised by three laws: Law 15/1999 of 13 December on the Protection of Personal Data, Law 41/2002 of 14 November regulating the patient's autonomy and rights and obligations concerning information and clinical documentation and Law 16/2003 of 28 May on the Cohesion and Quality of the National Health System.

The Spanish Data Protection Legislation is overall very similar to the European Directive, but with regards to the processing of health data it is characterised by explicitly incorporated cases for which the consent of the data subject is not required, cases for which the Spanish government opted for an opt-out instead of opt-in. Amongst these cases is the case in which the health data are needed by the National Social Health System, even when the transfer takes place by electronic means[30].

Obligation to store health data and electronic clinical records in a decentrali-sed manner

Another element in the Data Protection Legislation worth mentioning is the obligation to store health data and electronic clinical records in a decentralised manner. This obligation is also repeated in the Law on Patient Autonomy. In the latter law a distinction is made between three types of health data: medical or clinical documentation (documentación clínica) which related to a patient's specific care episode; the patient's medical record (historial medico) which contains information on the status and the medical evolution of a patient throughout the entire care process; and medical or clinical information (informacíon clínica) which refers to the acquiring or extension of knowledge on the physical and health status of a person in order to provide him better health observation, attendance and recovery.ds maintained by health authorities

The decentrally stored data will be shared through the National Health System. The National Plan on the NHS foresees to guarantee citizens that all healthcare professionals will only have access to the medical information that they require for the citizens' attendance. The medical records will be maintained by health authorities, who will be responsible issue health insurance cards, include the data of every person in the region and for processing the data. The use of medical records will enable the consistency of data assurance to avoid simultaneous assignment to different health services and obtain best value for money at intersections of data between the official files needed for proper maintenance. The NHS will become fully operational when various projects, such as ePrescribing or electronic clinical record are implemented.

3.5.1 Patient rights

In Spain the rights and duties of healthcare providers and patients are regulated by the Health Law 14/86[31]. The law regulates rights such as: respect for the patient's personality, right to information and the right to free choice among the treatment options presented. The latter implies that the previous explicit consent of the patient is necessary before

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[30] Art 6 Data Protection Legislation and Art 53-56 Cohesion and Quality Law.

[31] General Health Care Act 14/1986, 25 April.

treatment is admitted. A written consent is moreover required in all cases which involve risk and possibly important problems for the patient, especially medical operations, diagnoses and invasive therapeutics[32].

For the creation of an electronic health record too an explicit consent is required by the Health Law read in conjunction with the Data Protection Legislation. Additionally, patients can demand the deletion of data from their healthcare record and can hide certain information. The patient has, more specifically, the option of requesting a private area in his record, only accessible to his doctor.

In the Basque Country, the patient can even choose which prescriptions will be visible for everyone and which will be encrypted with a key that only the patient has.

In general, access control has gained significant importance since the creation of Law 41/2002, as it established a basic regulation on patient autonomy, rights and obligations regarding information and clinical documentation. Security mechanisms set out by law are: The document must incorporate a generic way of secure access for the owner (patient) and the various types of legal representatives. It should also differentiate between direct access, as users of the system or through a management system or federation if identity with the health service that provides digital identity to the patient (for example through real time verification of the identity of the health card keeper by addressing the relevant health administration).

It specifies that the following users have access to patient records:

> **Spanish regulation on who may have access to Electronic Patient Records:**
> - Professionals from a medical centre where the citizen is a patient as well as administrative staff have access– if the information is necessary to provide healthcare
> - Patients or their representatives – with the exception of access to personal comments by the health professional, here, the professional can restrict access rights
> - The right of accessing a patient's medical history is cancelled when there is a conflict with the right of others and when the protection of confidentiality is in danger –for example when information was recorded for therapeutic reasons or when there is a conflict with the rights of a professional involved
> - Health centres and individual physicians only gain access to medical records of deceased patients, for related persons, family or factual reasons – except the deceased has explicitly forbidden access to his or her files

In any case, third party access to a medical history of a patient motivated by a health risk is limited to relevant data. Above all, no information that affects the privacy of the deceased, personal comments from professionals or information that could harm others is released.

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[32] Art 8 Patient's Autonomy Law 41/2002.

3.6   Financing and reimbursement issues

The Spanish healthcare system is financed through the central and regional governments. The "Sanidad en Linea" program in 2006 initiated a joint investment of 252 million euros from the national government (141 million) and the autonomous community governments (111 million). There also is a recurring public budget dedicated to eHealth, which is defined in the different national and regional eHealth programmes.

Through the Ministry of Health and Social Policy and the Ministry of Industry, Tourism and Trade (upon which the public agency Red.es depends), the Government of Spain has defined a new phase for the programme to give continuity to the actions ("Sanidad en Linea" - Phase II). Investment by the General Administration of the State will amount to € 101.6 million and the Regional Authorities will contribute € 94.2 million. The framework agreement entered into in June 2009 allows some of the National Health Service's main pending challenges to be tackled, which will be carried out once again through new specific agreements with every Regional Authority. Many of the programmes for eHealth carried out by the public company Red.es are possible because of co-funding from the European Union, namely the European Regional Development Fund (ERDF). It contributes – among other objectives – to the development of the productive environment, research and technological development and the development of the information society. The actions in this area are intended to encourage the use of ICT in the healthcare environment. This work is done in close collaboration with the National Ministry of Health and the Ministries of Health of all the autonomous communities, that use their own budgets to co-funding the ERDF founds.

3.7   Evaluation results/plans/activities

From a public policy perspective, evaluation is a key activity in the policy-cycle. It provides insights into the success or failure of a policy or project and leads to new policy goals and new methods of implementation. The need for evaluation of eHealth policies and projects has been stressed time and again by the EC, not least in order to further the spread of eHealth in the process of healthcare delivery.

For monitoring and evaluation a Monitoring Committee has been established in 2005, which includes two representatives from the Ministry of Health (one of whom will chair the Committee), representative of the Ministry of Industry, Tourism and Trade and two representatives of Red.es. This committee meets at least twice a year. [33]

Up to now, Spain has evaluated its electronic health record, ePrescription and the interplay of various infrastructural components in the overall system:

The report "Las TIC en el Sistema Nacional de Salud" (ICT in the National Health System), published in 2008[34], examines the implementation progress and the investment in information and communication technologies in the National Health System. The information gathered through the project, is used as a tool to define the development stage of information and communication technologies in the Spanish health sector by highlighting the work that has already been done and serving as a reference for future actions.

The report contains data on initiatives undertaken by the Ministries of Health and Health Services of the autonomous communities in the last decade. It also gives insight into the impulse that led to the eHealth program and into international strategies that help to situate initiatives in the Healthcare System. The performance of the report was made possible through the collaboration of heads from all Ministries of Health in the autonomous communities, which collected and analysed the data.

Avanza Plan

The report was conducted in the context of the Avanza Plan monitoring, in which the Ministry of Industry, Tourism and Commerce, the Ministry of Telecommunications and Information Society and through Red.es the Ministry of Health and Consumer Affairs and the autonomous communities took part.

The organiser of the evaluation was the National Observatory for Telecommunication and Information Society (ONTSI), an agency attached to the public company Red.es. As shown above, it was conducted in collaboration with other stakeholders (Ministries and autonomous communities).

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[33] Gobierno de España. Ministerio de Industria

[34] Lareo, Kontaxakis et al. 2008

> **The Observatory for Telecommunication and Information Society (ONTSI)**
> - Monitoring and analysing the telecommunications and information society sector in Spain
> - Developing, collecting, synthesising and systemising indicators
> - Execution of studies
> - Offering news and current affairs on the information society
> - Node for communication of different stakeholders within the field

The Observatory itself is monitoring and analysing the Telecommunications and Information Society sector in Spain. It develops collects, synthesises and systemises indicators, carries out studies and offers news and current affairs on the Information Society – thereby it is the leading public observatory in Spain at the moment. ONTSI is also a place for dialogue between the field of Information Technologies and Communication and the various public administrations as well as for policy definition and its subsequent evaluation.

On a regional level, there has been an evaluation of the implementation of telemedicine in ophthalmology in the Basque Country.

The annual report "Catedra Sanitas Observatory on e-Health, information and communication technologies in the Spanish health system" is conducted within the framework of cooperation in the Quality Plan for the National Health System, under the collaboration agreement signed by the Carlos III Health Institute, an autonomous agency of the Ministry of Health and Consumer Affairs and the Department of Health of the Basque Country Government (OSTEBA). The guidance of the last report has been carried out by OSTEBA, Oficina de Evaluacion de Tecnologías Sanitarias del Departamento de Sanidad del Gobierno Vasco (Basque Country Office for Health Technology Evaluation from the Basque Country Government). The "Catedra Sanitas" is a foundation that emerges from the collaboration between the Sanitas Foundation and the University of Madrid. It is responsible for the creation of the Observatory on eHealth.

Summing up, at a national level, new health techniques or procedures are subject to evaluation by the Ministry of Health and Consumer Affairs, through the Agency for Health Technology Assessment of the Health Institute Carlos III, in collaboration with other evaluating organisations on the proposal of the autonomous communities. Regionally, there are organisations such as the Basque Country Office for Health Technology Evaluation (OSTEBA) or the Agency for Health Technology Assessment of Andalusia (AETSA), which perform this function. While not specifically geared to evaluation of eHealth, these organisations have done reports – for telemedicine for example.

4   Outlook

The regional character of Spain makes it difficult to judge eHealth progress for the country as a whole. Certain autonomous communities such as Andalucia or Castilla la Mancha have made very important progress regarding full implementation of eHealth services.

Future developments in eHealth in Spain will all focus on making regionally available services also available at the national level. Key conditions for success are in place, such as a system of unique identifiers and certain eHealth projects in the autonomous communities such as Andalucia are very advanced and provide valuable lessons.

Spain also provides a few "lessons" and insights into successful eHealth strategies:

- The key role of the "Quality Plan for the Spanish National Health System" and "Avanza Plan" has to be underlined. This strategy paper gave the first impetus to important government investments in ICT related services, including healthcare. It provided a total of €186 million in investments for the period of 2009-2012, 40% of the funding was from "Quality Plan".

- Regional eHealth initiatives in Spain are thriving: some regions develop (much) faster than others – though no best practice model can be identified.

- Efforts on the national level immediately lead to questions of interoperability. This becomes especially apparent when looking at data storage and electronic patient records, which have to be accessed from any region, any time.

Key concerns on the agenda at the moment are questions related to data storage and access to these by patients and professionals – in connection to that the role of eCards for professionals is under discussion.

5   List of abbreviations

AETSA	Agency for Health Technology Assessment of Andalusia
CISNS	Consejo Interterritorial del Sistema Nacional de Salud [Inter-Territorial Council of the National Health]
DRG	Diagnosis Related Group
EC	European Commission
EEA	European Economic Area
EHR	Electronic Health Record
EHRNHS	Electronic Health Records within the National Health System
EMR	Electronic Medical Record
EPR	Electronic Patient Record
epSOS	European patients Smart Open Services
ERA	European Research Area
ERDF	European Regional Development Fund
EU	European Union
GAISHC	Semantic Interoperability Group for Medical Records
GDP	Gross Domestic Product
GERT	Group of Technology Standards and Technical Requirements
GP	General Practitioner
HCDSNS	Historia Clinica Digital del Servicio Nacional de Salud [Development and Implementation of Digital Records in the National Health System]
HCP	Healthcare Provider
HL7	Health Level Seven International (authority on standards for interoperability)
HMO	Health Maintenance Organisation
HPC	Health Professional Card
ICT	Information and Communication Technology
ID	Identification (e.g. number, card or code)
IHTSDO	International Health Terminology Standards Development Organisation
INGESA	Institute of Health Management
IT	Information Technology

LSP	Large Scale Pilot
NHS	National Health Service
ONTSI	National Observatory for Telecommunication and Information Society
OECD	Organisation for Economic Co-operation and Development
OMC	Organizatión Medica Colegial[Medical College Organisation]
ONA	The Basque electronic health card
OSTEBA,	Oficina de Evaluacion de Tecnologías Sanitarias del Departamento de Sanidad del Gobierno Vasco [Basque Country Office for Health Technology Evaluation from the Basque Country Government]
PC	Personal Computer
PESI II	Plan Euskadi [Country Plan] for the Information Society
PHS	Personal Health System
R&D	Research and Development
SMEs	Small and Medium Enterprises
WHO	World Health Organization

6   Annex

6.1.1   Annex 1: Compound indicators of eHealth use by GPs

Compound indicator name	Component indicators	Computation
Overall eHealth use	- Electronic storage of individual medical patient data - Electronic storage of individual administrative patient data - Use of a computer during consultation with the patient - Use of a Decision Support System (DSS) - Transfer of lab results from the laboratory - Transfer of administrative patient data to reimbursers or other care providers - Transfer of medical patient data to other care providers or professionals - ePrescribing (transfer of prescription to pharmacy)	Average of component indicators
Electronic storage of individual medical patient data	- A2a - Symptoms or the reasons for encounter - A2c - Medical history - A2c - Basic medical parameters such as allergies - A2d - Vital signs measurement - A2e - Diagnoses - A2f - Medications - A2g - Laboratory results - A2h - Ordered examinations and results - A2i - Radiological images - A2j - Treatment outcomes	Average of component indicators
Electronic storage of individual administrative patient data	- A1 - electronic storage of individual administrative patient	A1 value
Use of a computer during consultation with the patient	- B2 - Computer use during consultation	B2 value
Use of a Decision Support System (DSS)	- B3a - Availability of DSS for diagnosis - B3b - Availability of DSS for prescribing	Average of component indicators
Transfer of lab results from the laboratory	- D1e - Using electronic networks to transfer prescriptions electronically to dispensing pharmacists?	D1e value
Transfer of administrative patient data to reimbursers or other care providers	- D1a - Using electronic networks to exchange of administrative data with other healthcare providers - D1b - Using electronic networks to exchange of administrative data with reimbursing organisations	Average of component indicators
Transfer of medical patient data to other care providers or professionals	- D1c - Using electronic networks to exchange medical data with other health care providers and professionals	D1c value
ePrescribing (transfer of prescription to pharmacy)	- D1d - Using electronic networks to transfer prescriptions electronically to dispensing pharmacist	D1d value

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