eHealth Strategies

Country Brief: Greece

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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.

Disclaimer

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Executive summary

A national eHealth roadmap for Greece was launched by the Ministry of Health and Social Solidarity in 2006. It is based on a critical review of the national 2002-2006 ICT Action Plan "ICT in healthcare"[1] and incorporates new policies aligned with the European eHealth Action Plan (2004). The policy paper is valid for the years from 2006 until 2015 and encompasses infrastructural issues and specific health applications such as, electronic health records, health cards, ePrescription, EDI based Hospital Procurement etc.

In May 2010 "The Economic Adjustment Programme for Greece" was published by the European Commission. It acknowledges the difficult economic situation in which Greece currently finds itself and the need for reform in particular expenditure cuts. Greece is a country in transition and any plans for healthcare developments, particularly in light of the social insurance reform, are in a state of transition too.

In order to consider Greece's position regarding eHealth interoperability objectives the following eHealth applications have been examined: patient summaries and electronic health records, ePrescription, standards and telemedicine. In overview Greece's situation is as follows:

In Greece, the development of an electronic patient record is a major objective and a priority of the National Health System upon which all related applications will be based. The development of patient summaries is also in planning for administrative/demographic as well as emergency care data. For this, a complete set of specifications has not yet been issued. However, harmonisation of legislation is required before implementation can take place.

In Greece, small-scale pilots for ePrescription took place between 2006 and 2008. These pilots include the eTransmission of prescriptions to pharmacies and connection to an electronic medication record.

Greece takes part in various European and International standardisation activities. Groups of experts from various sectors including academia and industry participate, through Greece's National Standards Organisation, in the international standardisation effort. However, as the final set of system's specifications has yet to be issued adoption of specific standards is still under negotiation.

At the regional level, there are pilots ongoing in Greece for Telemonitoring, Teleconsultation and call centres providing patient information. However, although the Greek eHealth roadmap (2006-2015) recognises the importance of telemedical applications, legislative issues are obstructing nationwide implementation of such projects as doctors cannot be reimbursed by public insurance schemes for telemedical care.

[1] Doupi 2007

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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",[2] 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*[3] 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.[4]

On the more specific aspects of electronic health record (EHR) systems, the recent *EC Recommendation on cross-border interoperability of electronic health record systems*[5] 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.[6] 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)[7] - and a project on "Good eHealth: Study on the exchange of good

[2] European Commission 2004
[3] European Commission 2007
[4] European Communities 2007
[5] European Commission 2008
[6] European Patients Smart and Open Services (epSOS)
[7] eHealth Priorities and Strategies in European Countries 2007

practices in eHealth"[8] mapping good practices in Europe - both of which provided valuable 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 Greece 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 collected through a long-standing Europe-wide network of national correspondents commanding an impressive experience in such work. For the report on Greece, Pantelis Angelidis provided information on policies and initiatives and examples for specific applications. He is the founder of VIDAVO[9], a health telematics company. He also is the president of INA (South-eastern Europe Telecommunications & Informatics Research Institute) and a member of the Board of HL7 Hellas. In addition, a handbook containing definitions of key concepts was distributed among the correspondents to guarantee a certain consistency in reporting. For Greece, 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 the different national 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

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

[9] Vidavo health telematics

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 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 Greece 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 *Greek* 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[10]

Greece, officially known as the Hellenic Republic, is the southernmost country on the European mainland. The country is divided into 13 administrative regions, nine mainland and four insular. These are further subdivided into 51 prefectures (nomoi), each with an elected prefect (nomarkhis). The current government's decentralisation policy has led to greater political influence for the regions.

During the last couple of years there have been systematic efforts towards the design, development and deployment of advanced broadband eHealth services in various healthcare sectors, including primary care, pre-hospital health emergency management and hospital care. However, this effort has not yet achieved appreciable results and, for this reason, the public is not yet able to use online health services despite ample demand for them.

In general, eHealth services are a much-awaited development since the Greek people are among the least satisfied with the national healthcare system in the EU. From a scale of one to ten they rate the quality of health services in the country with 3.7 in spite of the fact that Greeks actually have one of the largest ratios of doctors per inhabitants in the EU, which would normally be an indication of high quality service provision.

One way of explaining this paradox is that, in effect, the population of Greece is divided into two groups - in terms of healthcare provision - the advantaged that live in urban centres where there is a concentration of high-level medical expertise and equipment, and the less fortunate that inhabit the often secluded rural areas and islands, which suffer from poor quality and limited availability, of health services. Concerning this issue, there is a generic policy, the Information Society Initiative, for the provision of telemedicine services with the aim to improve healthcare provision all over the country though the use of Health Telematics Technologies.

In May 2010 “The Economic Adjustment Programme for Greece” was published by the European Commission. It included acknowledgement of the difficult economic situation in which Greece currently finds itself and the need for reform including expenditure cuts. These cuts have targeted public wages and pensions alongside which the Greek parliament drafted a reform bill for the reform of social security and pensions. The programme also includes reforms of the government budgeting system and fiscal framework as well as the tax system and its administration, the government’s general administration and product and labour markets[11]. This extensive reform programme has obviously had wide-reaching implications; previously stated objectives and plans will have to be reviewed before any progress can be made. Greece is a country in transition and any plans for healthcare developments, particularly in light of the social insurance reform, are in a state of transition too.

The box below summarises facts about the Greek healthcare system:

[10] eUser 2005

[11] European Commission Directorate-General for Economic and Financial Affairs 2010

Key facts about the Greek healthcare system:[12]

Life expectancy at birth: 79.6 years

Healthcare Expenditure as % of GDP: 9.6% (OECD 2007)

WHO Ranking of Healthcare systems: rank 14

Public sector healthcare expenditure as % of total healthcare expenditure: 60.3% (OECD 2007)

2.2 Healthcare governance

Decision making bodies, responsibilities, sharing of power

The National Health System offers universal coverage to the population, but this only applies to hospital care and primary care through 200 health centres and 1000 health posts for the semi-urban and rural population. Social insurance is compulsory for the working population and is occupationally based. There are approximately 240 social security funds, which provide a variety of insurance cover for some health services, retirement pensions, or welfare benefits.

Around 30 health insurance funds offer coverage to 95 percent of the population. The three largest funds are IKA (The government body operating Greece's national healthcare system), OGA (Organisation of Agricultural Insurance) and OAEE (Fund for the self-employed). People employed in banks, public utilities and some self-employed (10% of the population) are covered by separate funds. Moreover, the government runs separate schemes for civil servants, their dependants and military employees (12% of the total number of insurers).

Management of the insurance funds is the responsibility of representatives of employees, employers and the state. One might expect that the state would be the dominant party in the management of the funds, since all receive financial support from the state. However, this is not so. One explanation for this peculiarity lies in the fact that two of the largest trade unions in Greece – GSEE (National Confederation of Labour) and ADEDY (Confederation of Civil Servants) – are controlled by trade unionists who are influential within PASOK, the political party that has been in government for 19 of the past 22 years."[13]

The figure below depicts the organisational structure of the Greek healthcare system

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

[13] Nikolentzos and Mays 2008, p.167

Figure 1: Organisational structure of the Greek healthcare system

Healthcare service providers

"There are three major categories of providers: the NHS (public hospitals, health centres, rural surgeries and emergency pre-hospital care); insurance funds' health services (mostly established within the IKA); and the private sector."[14]

"The National Health Service (ESY) provides free care in public hospitals and health centres in rural areas. Insurance funds maintain an extensive network of their own in clinics for basic care, but refer members to state hospitals for specialist treatment. There is a growing private healthcare sector used by higher-income earners. Large life insurance companies are also acquiring diagnostic clinics and hospitals. The ND government has promised to establish the concept of a family doctor based on private practitioners, who will overturn the practice of requiring doctors to work either in the public or the private sector. The government is slowly elaborating, with private insurers, terms under which private-sector doctors may use public-sector hospital facilities (particularly those constructed in the Athens area ahead of the Olympic Games); with a view to helping alleviate ESY's chronic funding shortages.

Similarly, legislation has been drafted calling for the involvement of the private sector in the construction and management of public infrastructure, including hospitals under public-private partnership (PPP) and private finance initiative (PFI) schemes.

Greece's healthcare system is facing mounting demographic pressure, with longer life expectancy and a rising proportion of the total population aged 65 or over. The government promised in its 2004 election manifesto to increase public spending on healthcare to the equivalent of 5% GDP, but this failed to materialise because of budgetary constraints. However, it is moving towards meeting this promise with its 2007 budget, which provides for spending on health equivalent to 4.6% of GDP."[15]

[14] Nikolentzos and Mays 2008, p.167

[15] Economist Intelligence Unit 2007

Figure 2: Important features of primary healthcare organisation in Greece

Political/administrative unit responsible for primary healthcare	Up to now the Ministry was responsible, but a major reorganisation (Kallikratis plan) was recently announced where primary healthcare will be assigned as a responsibility at municipality level.
Consumer Choice	Free choice of GP.
Financing	Mainly tax-based.
Public or private providers	Publicly employed primary care providers.
Gatekeeping function of the GP	Patient access to specialists.

2.3 Recent reforms and priorities of health system/public health

Currently ongoing reforms in the health and social care systems

"Greece has enacted three major healthcare reforms since the National Health System (NHS) was established in 1983. These reforms were designed to improve the system's ability to realise its founding principles of equity and efficiency in the delivery and financing of health services."

"For many years, the health system in Greece has been in a state of continuous crisis. The basic aspects of this crisis involve a fragmented administrative framework, low levels of public expenditure, a significant private sector, which is under loose control, inadequate hospital services, skewed manpower, and a low level of primary healthcare.

The awareness of these problems and the resulting need to improve and modernise the health system, have led to various attempts for reforms which have been undertaken over the last 30 years."[16]

"In July 2000, the new Minister of Health and Welfare announced the new reform consisting of 200 measures. Those measures were planned in accordance with the problems and needs of the ESY as described in the previous chapter and in consideration of the evidence produced by the reform measures which were implemented in many European countries during the last 10 years [15]. Thus, the main objectives of the reform were the decentralization of the system and its regional organisation, the split between purchasers and providers and the creation of an internal market, the reinforcement of the Primary Health System, the effective management of hospitals and the establishment of a new collaborative relationship between the public and the private

[16] Tountas, Karnaki et al. 2002, p.15

sector. The most important change introduced is the establishment of Regional Health Systems (Periferiaka Systimata Ygias/PE.S.Ys). The country is divided into 17 health regions, each of which will have an autonomous regional health system.

Athens, the capital of the county will have three PE.S.Ys and Thessaloniki (the second largest city in Greece) will have two. All regional health services namely hospitals, health centres, etc of ESY or of the social insurance funds (mainly IKA) will be under the jurisdiction of the regional PE.S.Y. whose central administration will be exercised by a Board with a President-General Director accountable to the Ministry of Health and Welfare. Every regional Board will consist of nine members. Apart from the President and the Vice President, the Minister of Health will appoint three more members. The remaining four positions will be filled by representatives of the regional authorities, PE.S.Y. doctors, the medical association and representatives of remaining PE.S.Y employees. The Board of each health region will manage an annual budget, which will be covered by public finances and revenues from the operation of the health system. Within the available resources, there will be the possibility of improving existing health units, building new ones and closing down or merging old ones. There will also be the opportunity for managing manpower, a responsibility that was exercised centrally by the Ministry of Health and Welfare until today."[17]

Due to financial turbulence Greece received advice from the European Commission in February 2010. It recommended that Greece adopt a comprehensive structural reform package to restore the competitiveness of its economy, which had been affected by the size of the country's budget deficit. Within this reform package the restructuring of healthcare was seen as an area of focus.

In May 2010 The Economic Adjustment Programme for Greece was produced by the Directorate-General for Economic and Financial Affairs. In it were plans for administrative and accounting overhaul, including the plan to separate the financing of the health sector from pension administration and to unite all health related activities under one ministry[18]. The programme also outlined more specific plans, such as the strengthening of procurement practices to ensure transparency and efficiency, a reorganisation of sub-central government to reduce the number of local administrations and officials, a review of public administration of central government[19], the government implementation of double-entry accrual accounting in hospitals, the regular publication of audited accounts and improvements in pricing and costing mechanisms[20].

More specifically the programme outlined new sources of revenue for healthcare: broadening of the VAT base, increasing rates and raising excise taxes where Greece is below the euro area average and collection efficiency is low. Green taxes and "health" taxes (such as on consumption of alcohol and tobacco) will also play a part in the revenue raising effort[21].

[17] see above, p.22-23.

[18] European Commission Directorate-General for Economic and Financial Affairs 2010, p.44.

[19] see above, p.48.

[20] see above, p. 44.

[21] see above, p.43.

The programme does not only set out financial and administrative renovation for Greece, but includes the modernisation of healthcare: adopt legislation on the institutional framework for health supplies (Law 3580/2007), establishes new systems for the management of drugs that favour more use of generic medicines, including a new system for the electronic monitoring of doctors' prescriptions; completes the programme of hospital computerisation, upgrading hospital budgeting systems, and the reform of management, the accounting and financing systems; ensures greater budgetary and operational oversight of healthcare spending by the Finance Minister, the publication of audited accounts and improvement in pricing and costing mechanisms[22].

However, as these reforms have only been suggested as recently as May 2010, it is impossible to say how far or successfully they have been implemented, this means that much of the material in this report focuses on older sources. It is also, for the same reason described above, difficult to confirm whether these original programmes and projects will continue as originally intended, or whether, and to what extent, they will be modified.

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[23].

In terms of infrastructure, 79% of Greek GP practices use a computer. 66% of practices dispose of an Internet connection. In Greece, broadband connections have not yet arrived in force; they are however already used in 44% of GP practices.

When it comes to the use of eHealth solutions, Greece displays its best eHealth performance in the area of patient data storage. Computers are already used in consultation with the patients to some extent (20% of the GPs). Decision Support Systems are still rather the exception than the rule. They are used by 12% of Greek GPs.

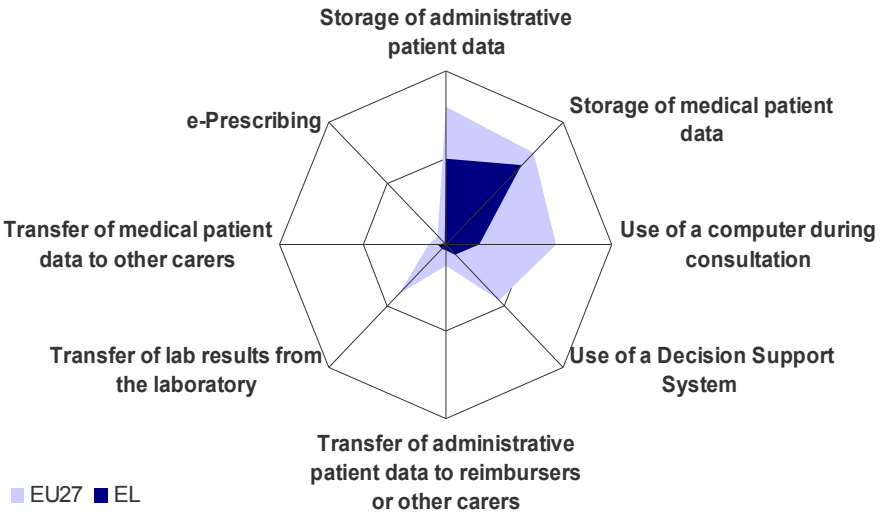
Patient data transfer has as yet not very much arrived on the agenda of Greek GPs. The use of electronic networks for the transmission of medical patient data is not well established. Only 4% of the GP practices participating in the survey reported having exchanged medical data with other care providers via some sort of network, 3% having received analytic lab results this way. As concerns the transfer of administrative patient data, a very similar pattern appears: only 4% of the practioners use networks to exchange administrative data with other healthcare professionals and 3% transfer administrative data to reimbursers this way.

ePrescribing is still not a reality in most European member states. This holds true for Greece as well where only 2% of GPs having participated in the survey reported using ePrescribing.

[22] see above, p.67.

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

Figure 3[24]: eHealth use by GPs in Greece



Indicators: Compound indicators of eHealth use (cf. annex for more information), % values. Source: empirica, Pilot on eHealth Indicators, 2007.

3 eHealth strategies survey results

The following sections present the results of the eHealth Strategies online study. In a first section, the eHealth policy actions undertaken in Malta 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).

3.1 eHealth policy action

The eHealth strategies of EU and EEA countries are not always labelled as such. 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 governing 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, also documents from domains such as eGovernment or Information Society strategies may contain provisions which concern eHealth. In cases where the healthcare

[24] 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. (see Annex) The final results of the study on eHealth Indicators is available at www.ehealth-indicators.eu.

system is decentralised, i.e. where power is delegated to the regional level, there may even be strategy documents regarding eHealth from regional authorities

3.1.1 Current strategy/roadmap

National Strategy for Quality and Safety of Healthcare Services in the Knowledge Society 2006-2015

A national eHealth roadmap for Greece was launched by the Ministry of Health and Social Solidarity in 2006 as part of the conference "National Strategy for Quality and Safety of Healthcare Services in the Information Society"[25]. It is based on a critical review of the national 2002-2006 ICT Action Plan "ICT in healthcare"[26] and includes re-orientation where appropriate to accelerate national progress and incorporates new policies aligned with the European eHealth Action Plan (2004). The policy paper is valid for the years from 2006 until 2015 and encompasses infrastructural issues and specific health applications such as, electronic health records, health cards, ePrescription, EDI based Hospital Procurement etc. The implementation of this ten-year roadmap is split into three major phases: During phase 1 (2006-2007) the standardisation and communication infrastructure had to be strengthen, strategic pilots took place and legislative interventions were prepared. During the second phase (2007-2012) the focus will be on large-scale pilots and the integration of the Health Network at the regional level. In the third phase (2012-2015) integration of the Health Network on national level is planned.

Another document, which shaped the development and deployment of eHealth applications, is the "Operational Programme for the Information Society (OPIS)"[27]. It was adapted in 2000 and supported by the European Union as part of the Community Support Framework[28]. OPIS is aiming to implement the essential features of the Greek of the White Paper of the Greek government entitled "Greece in the Information Society" of February 1999. It also follows through the eEurope initiative and the conclusions of the Lisbon Summit of March 2000.

The four lines of actions, which are addressed in the policy paper, are: 1) education and culture, 2) citizens and quality of life, 3) digital economy and employment and 4) communications. Especially important for eHealth is the area of "citizens and quality of life", as it addresses the use of IT "in order to promote and support a broader strategy for providing higher quality of health and welfare services to all citizens, and for the reform of the management of the health sector and its budget" as well as the "introduction of telematic applications in land, sea and air transport ('intelligent transport')".

A revised version of OPIS has been approved in December 2008 regarding the extension of the field "citizens and quality of life" and "communications". The funds corresponding to the first one amount to 866,11 million € out of the total budget by OPIS of 2.676 million €. The programme now also includes a fifth line of action aiming at supporting the effective implementation of the projects planned.

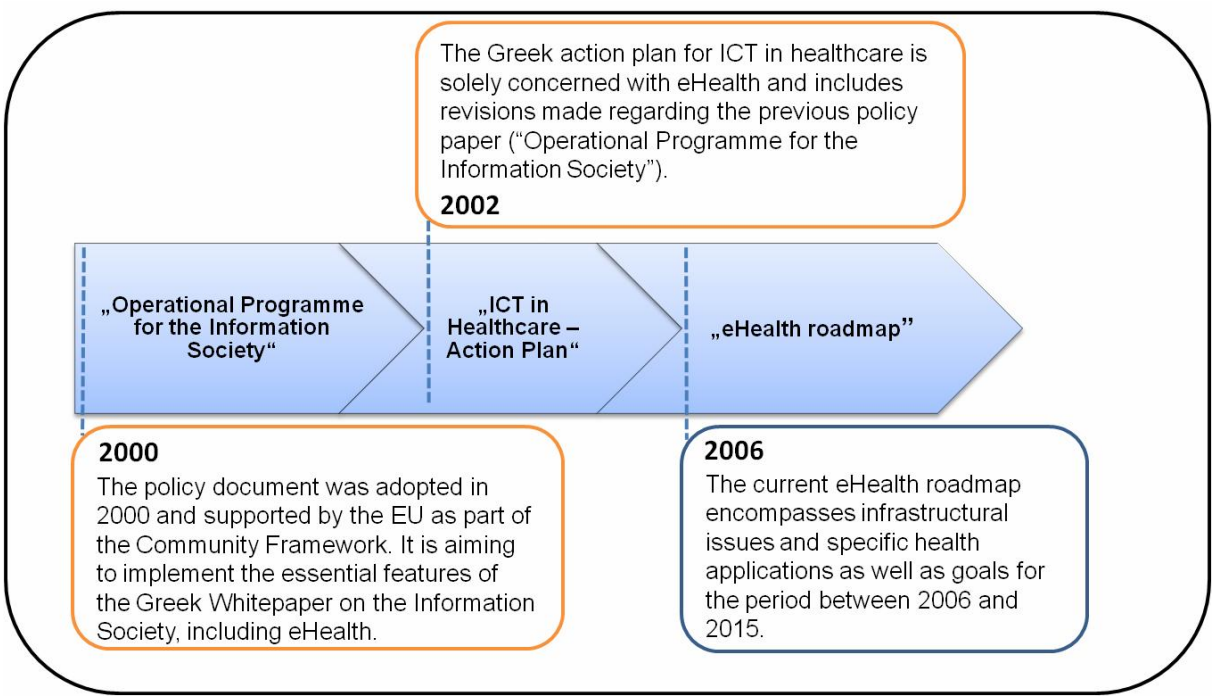
[25] Digital Healthcare 2006

[26] Doupi 2007

[27] Greek Government 2000

[28] European Commission 2008

Figure 4: Greek policy documents related to eHealth



3.2 Administrative and organisational structure

Ministry of Health and Social Solidarity

In Greece, so far the Ministry of Health and Social Solidarity has the sole responsibility for the eHealth structure. No dedicated eHealth institution has been established. Stakeholders are integrated into the decision-making process through official bodies. This applies to doctors and pharmacists and also to patients, who are formally organised in groups according to their condition (e.g. organ transplants, chronic renal failure, thalassemia, Alzheimer's). Sometimes they are invited to participate at a higher level together with the official decision-making bodies.

Payers are represented by the minister of finance or the minister of employment and social insurance. There is no procedure in place at that time that allows the integration of all stakeholders into the development of eHealth. At the moment, there is no legal framework in place, which addresses or resolves organisational issues and challenges within the system.

The recent change in Government brought forward the agenda of an overall process reengineering for discussing direct representation of various stakeholders in the development of new services. Probably in the next years a similar structure will be set up. Every aspect of healthcare provisioning public of private falls into the jurisdiction of the ministry of health according to the Constitution hence the decision making process will be somehow attached to the ministry for as long as the current form of Constitution holds true.

3.3 Deployment of eHealth applications

3.3.1 Patient summary (EHR)

In this study, the epSOS project's definition[29] 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.

In Greece, the development of an electronic patient record is a major objective and a priority of the National Health System upon which all related applications will be based. Data, which is planned to be stored in the health record includes:

- Administrative/ demographics
- Electronic medication record
- Medical history
- Laboratory results
- Radiology reports
- Emergency care data

The means of access to this data is the citizen's health card (see chapter 3.4.3).

The development of patient summaries is also in a planning stage since 2006 regarding administrative/demographic as well as emergency care data. For this, a complete set of specifications has not been issued at that time.

Another objective, which is listed in the Greek eHealth roadmap is a condition-specific summary for cardiac diseases, diabetes, medication and e.g. COPD[30] or chronic renal

[29] European Patients Smart Open Services, http://www.epsos.eu/glossary.html?tx_a21glossaryadvancedoutput_pi1[char]=p&cHash=df930cccbd

[30] Chronic obstructive pulmonary disease

failure. Especially diseases that are connected to high treatment costs are foreseen for further condition specific summaries.

At the present stage, the challenging aspects of the implementation of EHRs and condition-specific summaries are connected to the lingering harmonisation of legislation with the relevant European directives that will boost the process reengineering activities required for such an implementation. In contrast, no technical challenges are present as the technologies involved for the creation of these applications are said to be mature and well proven.

3.3.2 ePrescription

In the framework of this study and following work in epSOS[31], 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.

Small-scale pilots for ePrescription were conducted between 2006 and 2008

In Greece, small-scale pilots for ePrescription were conducted between 2006 and 2008. These pilots include the eTransmission of prescriptions to pharmacies and the link-up to an electronic medication record, for example in the "Interoperability Pilot" project linking hospitals, laboratories and the Association of Pharmacists of Attica (FSA) with 3 Sick Funds or the 'YPESDA'[32] project for a pilot involving ePrescription, patient summary and the use of a health card on two islands (Samos and Lefkas).

Generally, the Greek eHealth roadmap emphasises the importance of ePrescription to control the cost of over-prescription which is estimated by the Association of the Greek Pharmaceutical companies at approximately 350 million € per year a figure that the authorities have reasons to believe that is still underestimated. For the time being no official report is published stating the cost of over prescription in the country.

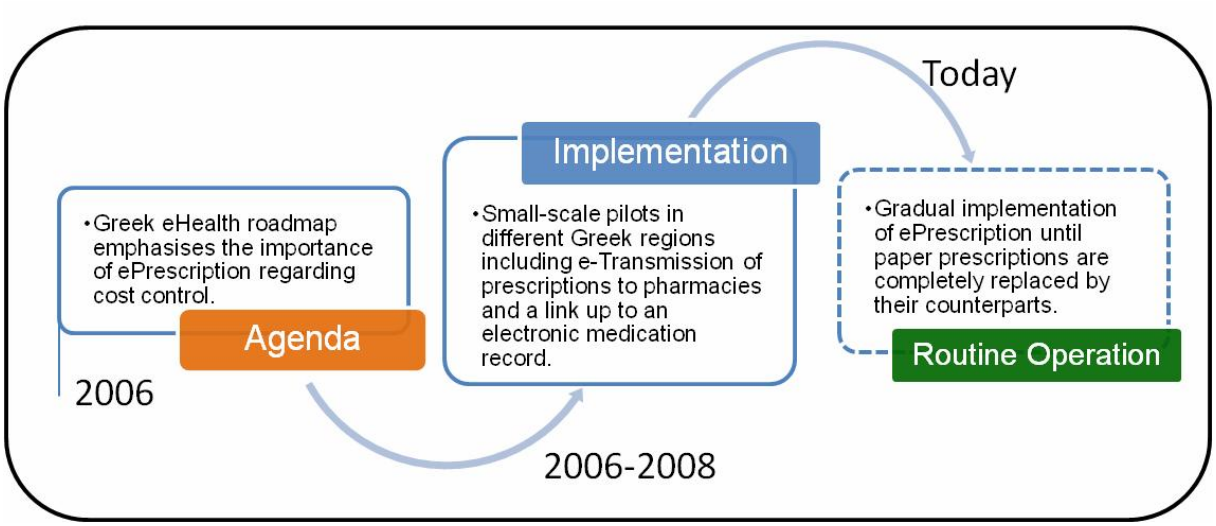
Since early 2010, the General Secretariat for Social Security has also undertaken the national deployment of ePrescription services in Greece. This action is under the broader framework of current Health and Social Security reform which is under implementation and includes technological, organisational, institutional and legislative measures. The aim is to improve services offered to Greek citizens, improve the functionality of the pension funds and minimise healthcare costs. The deployment has two phases. During the 1st phase, ePrescription will cover day to day operations between healthcare practitioners, pharmacists and citizens. During the 2nd phase the implementation of additional procedures and services is anticipated, such as dosage control, drug interactions, clinical support decision tools, etc.

An ePrescription scheme will be gradually implemented thus the start up percentage will be less than 20% until paper prescriptions are completely replaced by their electronic counterparts. For this development to gain momentum a legal framework for electronic applications in healthcare has to be created and organisational constraints to be overcome.

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

[32] Ministry of the Interior, Public Administration and Decentralisation

Figure 5: ePrescription progress in Greece



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.

ELOT and HL7 HELLAS are institutions for standards

ELOT[33] is the Greek organisation for standards. It hosts and supports all relevant standardisation committees of both European (EN) and International Organisations (ISO). The Hellenic Organisation for Standardisation was established as a non profit private legal entity with the Law 372/76 that was voted unanimously by the Parliament on 10 June 1976 and was published in the official government gazette on 30 June of same year.

In general, Greece takes part in various standardisation activities of both European and International nature. HL7 HELLAS[34] is an active body creating awareness on health informatics standardisation issues. Through Greece's National Standards Organisation, groups of experts ranging from academia to industry and decision-making bodies participate in the international standardisation effort. However, adoption of specific standards is still under negotiation as the final set of system's specifications has not been yet issued.

In contrast to challenges faced in other implementation domains, when it comes to standardisation, it is the technological challenges that prevail. Close monitoring of the European and International activities in the eHealth field are seen as a priority of the National Standards Organisation (ELOT) currently responsible for taking the strategic decisions that will facilitate the adoption of standards

[33] ELOT

[34] HL7 Hellas

3.3.4 Telemedicine

Regional pilots for Telemonitoring, Teleconsultations and call centres for patients

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"35. 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[36].

On regional level, pilots for Telemonitoring, Teleconsultation and call centres for patient information and care are ongoing in Greece. But the development towards nationwide implementation is currently difficult, because there is a legislative gap as doctors offering telemedicine services cannot be reimbursed from the public insurance schemes. This problem is well known to the policy makers who will attempt to address it by including it in a series of measures to be taken shortly for the reorganisation of the National Health System.

The Greek eHealth roadmap (2006-2015) emphasises the importance of telemedical applications in primary healthcare support especially in relation to accessibility for the extensive coastal line as well as the mountain regions. The draft law for the establishment and operation of the primary healthcare also included telemedicine. However, this draft law continues to be under discussion.

Overall, the technical side of telemedicine is reaching the required level of quality of service, but the Greek geographical conditions make it difficult to implement the technology or rather make large-scale broadband accessible for everyone. Regarding legal and organisational challenges occur around the harmonisation and update of relevant legislation combined with the radical process of reengineering. Especially for Telecare and Telemonitoring, there are special challenges related to cultural aspects, such as the change of the traditional relation between the treating physician and the patient. Here, the creation of awareness is seen as one solution to these changes for both sides.

[35] Europe's Information Society, http://ec.europa.eu/information_society/activities/health/policy/telemedicine/index_en.htm

[36] European Commission 2008

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 Greece and for which purpose.

3.4.1 Unique identification of patients

Traditionally Greek services rely on the mandatory paper-based identity card in conjunction with the information contained in population registers held by municipalities for the identification of citizens. In healthcare the patient is identified through his health booklet, which is issued by his insurance company. In addition the use of the unified national Social Security Number (AMKA) assigned to every person covered by a Greek social insurance fund is mandatory since the 1st of October 2009. The number is assigned through the Insurance Organisations.

For the development of a dedicated patient ID, Greece is planning (since 2006) to establish a National Health Information System, which also is a prerequisite for the implementation of health smart cards for every citizen. IASYS, the central infrastructure of the NHIS will be implemented in 3 phases. The initial planning foresees that the first phase includes small-scale pilots of health cards, but so far this plan has not been materialised. The driving force of such a reform is always the political will and wish of each government. It is the resolution of the newly elected Government that the NHIS will go on despite the country's poor financial situation.

3.4.2 Unique identification of healthcare professionals

In Greece, the following health professionals have a unique ID since before the year 2000:

- Medical doctors
- Dentists
- Pharmacists
- Nurses
- Midwifes
- Opticians
- Psychologists
- Physiotherapists

These IDs for the different fields of profession are not planned to be implemented into a centralised structure in form of a national electronic registry. This also stems from the fact that there are legal and organisational constraints. Before aiming for further development, the legislation regarding health services have to be updated in order to accommodate multilevel identifiers and to pave the way for the detailed description digital services. The

associations of health professionals are controlled and supervised by the ministry of health which is the sole provider of professional licences per category.

3.4.3 The role of eCards

As mentioned above, the National Health Information System is the prerequisite for the roll-out of eCards in Greece. The planned smart card will have a chip on which the following data is available:

Data on planned Greek eCard

- Administrative identification
- Clinical emergency data
- Clinical prescription data
- Insurance status verification

The card will be used as a health insurance ID as well as a patient ID. Generally, the focus is on the development and implementation of the smart card for patients, rather than on an eCard for professionals.

Challenging regarding eCards are not the technical aspects of implementation, as this application is considered a mature technology and has been implemented successfully throughout Europe, but rather – again – the harmonisation of legislation. This is crucial in order to allow for the use eCards throughout the spectrum of health services. If this is fulfilled then process reengineering could take place in order to derestrict organisational constraints.

3.5 Legal and regulatory facilitators

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.

New-elected government plans legal telemedicine framework

The Greek Law on the Protection of Individuals with regard to the Processing of Personal Data was introduced in 1997[37]. Although the Data Protection Law does not contain any specific provision on eHealth, the following comments can be made with regard to the processing of health data in Greece. First of the Greek Data Protection Law contains a broad interpretation of the term “health data” as it includes all medical data of a person in the broad meaning of the term, including information on prescriptions, drug taking and the use of narcotics, as well as the wider category of genetic data. Secondly it is characteristic of the Greek Data Protection Law that health data can only be processed on the basis of consent of the data subject after the controller obtained a written consent. Furthermore a permit needs – in principle – to be obtained from the Data Protection Authority before health data can be processed. Exemptions thereto are however foreseen

[37] Law 2472/1997.

in the Data Protection Law for doctors or other persons rendering medical services who are bound by medical confidentiality or another obligation of professional secrecy and provided the data are neither transferred nor disclosed to third parties. Consequently legal entities or organisations rendering healthcare services, such as clinics, hospitals and other health centres do need to obtain the permit.

Particularly important for ePrescription is the recognition by the Greek Data Protection Authority that health data contained in a prescription can be legally processed by the doctor who wrote the prescription and the pharmacist who executes it. However the communication of these sensitive data from the pharmacist to any third party in order to obtain the medicine that is mentioned on the prescription is rendered an unlawful processing[38].

In Greece there is no comprehensive regulation on the patient – physician relationship. Rights and duties of the patient are scattered among civil, penal, administrative and disciplinary laws. It is however worth mentioning the (new) Code of Medical Ethics[39] as this code enacted certain rights with regards to patients' medical records. Article 14§1 states that "the physician must keep up a medical file electronically or in printed form that contains data related to the illness or health of his patients". Hospitals too are on the basis of this medical code (art 14§3) obliged to archive all the results of patient's tests. Private doctors have to keep their archives for at least ten years after the last visit of the patient, public healthcare facilities need to keep the archives for as double as long: 20 years.

In early October 2009, the National elections brought forward a new government that according to its pre-election campaign has promised to implement a new framework governing the use of telemedicine services. So far nothing has been disclosed on the overall framework but for the identification of specific services that they are considered of high priority and these are related to the support of the inhabitants of the geographically isolated areas such as small islands and mountainous regions both of which exist in plethora in the Greek territory

Despite the legislation promise for telemedicine, so far nothing has been implemented, but especially concerning legislation, it is expected that progress will be made as soon as the new Minister of health presents the new framework for eHealth in general services.

Current "offline" situation is based on signing (wet signature) specific paper forms when the patient (or the next of kin in some cases – children etc) wishes to undergo a specific procedure. Without this written consent the doctor is not allow to perform any action. The forms are not entirely homogenised but there are similarities according to type of clinic which implies the available medical procedures.

[38] Decision 51/2002 Greek Data Protection Authority

[39] The Code of Medical Ethics has been approved by law: Law 3418/2005 on the Code of Medical Ethics: Greek Government 2005, http://www.bioethics.gr/media/pdf/biolaw/human/code_of_practice_new_gr.pdf

3.6 Financing and reimbursement issues

Basic funding through central government and European Commission

According to the Greek constitution health and consequently eHealth is a public good and financing the implementation and maintaining the relevant infrastructures is an obligation of the Greek state i.e. its central government. Recently there has been a lot of discussion on the migration of primary healthcare services by the central government to municipalities thus rendering the regional "governments" responsibility for implementing and maintaining health and eHealth infrastructures. Public Private Partnerships could pose another source of financing in the future.

In general, there is an annual public budget dedicated to health and efforts are made to increase this percentage for various reasons – not only to support eHealth applications.

The social insurance system is not part of the funding process so far, as for the time being, no formal reimbursement system has been established for relevant services. This implies that as soon as eHealth applications become routinely used, the reimbursement issue will reoccur on the agenda for financing.

International funding comes from the European Commission through specific programs and activities e.g. for eHealth pilots and sporadic implementations that after their launch and pilot operations should be self-sustainable.

Also here, legislation is a key issue for the implementation of an efficient eHealth financing infrastructure, which has to be developed by the newly elected government.

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.

In Greece, evaluation activities have not been undertaken so far, but plans for this are expected to be shaped by the new government – according to pre-election proclamations. In this process it is assumed that the Greek Standards Organisation (ELOT), as a competent authority will play a crucial role in the field of evaluation.

4 Outlook

In Greece, an eHealth roadmap and the technical equipment as well as technical quality of service are available, but different constraints hinder the further development of the electronic health infrastructure: 1) most recent obstacle that Greece is facing, is that the Greek state is insolvent and cost reduction will be the priority in all areas – also in healthcare; 2) a legal framework for any kind of ICT application is missing, this especially applies to the harmonisation of legislation with relevant EU directives of the last years; 3) organisational constraints partly derive from the legal gaps, as institutional responsibilities

and funding is not fully clarified and 4) the geographic condition of Greece with the extended mountainous areas and thousands of islands poses a problem.

At the end of 2009 a new government was elected in Greece, which made promises concerning eHealth – so far none of these have been met. The coming years will have to show, how the economic crisis develops and which programmes concerning eHealth can be funded by the government or the European Commission.

5 List of abbreviations

ADEDY	Confederation of Civil Servants
AMAK	National Social Security Number
COPD	Chronic obstructive pulmonary disease
DRG	Diagnosis Related Group
EC	European Commission
EEA	European Economic Area
EHR	Electronic Health Record
ELOT	Greek organisation for standards
EMR	Electronic Medical Record
ERA	European Research Area
ESY	National Health Service
EU	European Union
FSA	Association of Pharmacists of Attica
GDP	Gross Domestic Product
GP	General Practitioner
GSEE	National Confederation of Labour
HCP	Healthcare Provider
HPC	Health Professional Card
IASYS	The central infrastructure of the NHIS
ICT	Information and Communication Technology
ID	Identification (e.g. number, card or code)
IHTSDO	International Health Terminology Standards Development Organisation
IKA	The government body operating Greece's national healthcare system
IT	Information Technology
NHS	National Health System
NHIS	National Health Information System
OAEE	Fund for the self-employed
OECD	Organisation for Economic Co-operation and Development
OGA	Organisation of Agricultural Insurance

OPIS	Operational Programme for the Information Society
PE.S.Y	Periferiaka Systimata Ygias [Regional Health Systems]
PHS	Personal Health System
R&D	Research and Development
VAT	Value Added Tax
WHO	World Health Organization

6 Annex

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

Dobrev, Haesner et al. 2008

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