eHealth Strategies

Country Brief: Slovenia

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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

The current Slovenian strategy for eHealth is called “e-Zdravje2010” (e-Health2010) for the period from 2006 to 2010. This national roadmap focuses on eHealth and includes information systems and services. The Strategy follows the EU guidelines as outlined in the document “Communication on e-Health” (2004) and points out three strategic objectives: set up of the core information infrastructure, integration of the existing information systems on a national level and the promotion of the use of eCommerce in healthcare as a common mean for communication. The current roadmap also takes into account professional and business challenges of modern European health systems.

In order to understand Slovenia’s position in relation to key eHealth objectives this report has looked at various different aspects but particularly patient summary and electronic health record, ePrescription, standards and telemedicine. Here is an overview of Slovenia’s position:

In Slovenia, no basic patient summary exists, but is planned to be set-up in 2011. The same status is applicable for a national electronic health record (EHR). The Ministry of Health has done a feasibility study, which includes the development of a patient summary and an electronic health record. The action plan of this study envisions the gradual supplement of a patient summary within the coming year. It is the intention of Slovenia to include a patient summary on the (new) Slovene Health Insurance Card

The Slovenian Ministry of Health, the Chamber of Pharmacists, the Agency for Medical Products and Medical Devices of the Republic and other stakeholders have started to plan the implementation of ePrescription in form of workshops. ePrescription will include the eTransmission of a prescription to the pharmacy and a medication record. The estimated date for the beginning of the implementation is 2012.

In Slovenia, the national competent authority currently dealing with standards is the “Health Informatics Standards Board”. It is the Slovenian governing body for the health informatics capability.

There are regional pilot projects in the field of telemedicine carried out by specialised hospitals in Slovenia and is concerned with home management of patients. The only national policy or implementation programme for telemedicine is the “National Standard for Teleradiology”, which was prepared for a pilot project of the National Teleradiology Network.

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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

[1] European Commission 2004
[2] European Commission 2007
[3] European Communities 2007
[4] European Commission 2008
[5] European Patients Smart and Open Services (epSOS)
[6] eHealth Priorities and Strategies in European Countries 2007
[7] European Commission; Information Society and Media Directorate-General 2009

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 Slovenia 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. In addition, a handbook containing definitions of key concepts was distributed among the correspondents to guarantee a certain consistency in reporting. For the country report on Slovenia, Samo Drnovsek from the Institute for Project Management and Information Technology[8] provided information on policy contexts and situations, policies and initiatives and examples for specific applications. The Institute for Project Management and Information Technology is a consulting organisation, which performs basic research, application and development research, training and education.

The key tool to collect this information from the 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.

[8] Institute for Project Management and Information Technology (ipmit)

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 Slovenia 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 Slovene 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]

Slovenia's political system is a parliamentary democracy which is based on the tripartite division of powers between legislature, executive and judiciary authority. The Government of the Republic of Slovenia is the executive and supreme body of state administration. The executive function involves mainly preparation of legislation, proposal of the national budget and national programmes, and implementation of laws passed by the National Assembly.

The Government consists of the Prime Minister, the head of government, who is elected by the National Assembly for a 4-year term, and a 18-member Cabinet of Ministers. The Government for the most part endorses all healthcare reforms and, within its economic limits, is responsible for the healthcare services infrastructure (hospital, clinics and national research institutes).

Slovenia has a single-level system of local self-government. The municipalities, of which there are 210, are responsible only for local tasks. As a result of the appointment of a new government, responsibility for eGovernment has been transferred from the former Ministry of Information Society to a new Ministry of Public Administration. The new ministry also receives responsibility for overseeing the Government Centre for Informatics, which is in charge of infrastructure development at the operational level, and to support, control and coordinate departmental ICT projects.

Slovenia was the only one of the former Yugoslav republics to be in the first wave of candidates for membership of the European Union. It joined in May 2004. Slovenia also entered the Euro zone on 1 January 2007, as the first of the new EU Member States, having fulfilled the conditions set forth by the Maastricht Treaty.

Slovenia maintains a Bismarck-type healthcare system, which was introduced for workers as an extension of a compulsory accident insurance system in 1888. The insurance system experienced many changes. The 1992 Law on Healthcare and Health Insurance forms the legal basis for the current system. The law laid the basis for a centralised compulsory health insurance system to be administered by the HIIS. By statute, the HIIS is the sole provider of compulsory insurance. The HIIS operates autonomously and is governed by elected representatives of employers and the insured. In its capacity as the founder of the HIIS, the state has retained some main levers to manage and control operations, such as involvement in determining the contribution rate and the scope of rights (benefit catalogue) and resolving other important issues arising in the provision of public health insurance.[10]

The box below shows key facts of the healthcare system in Slovenia:

[9] eUser 2005

[10] Albreht, Cesen et al. 2002, p.23; Albreht, Turk et al. 2009

Key facts about the Slovenian healthcare system:[11]

Life expectancy at birth: 78.5 years

Healthcare Expenditure as % of GDP: 8.5% (WHO 2005)

WHO Ranking of Healthcare systems: rank 38

Public sector healthcare expenditure as % of total healthcare expenditure: 72.2% (WHO 2006)

2.2 Healthcare governance

Decision making bodies, responsibilities, sharing of power

The Ministry of Health develops the national health policy and provides regulatory and supervisory support to the healthcare system and health monitoring.[12] The activities of the Ministry relate to healthcare at the primary, secondary and tertiary levels, including the financing thereof. The Ministry monitors public health, prepares and implements health promotion programmes and ensures the conditions for health education. Activities further focus on supervising the production, trade and supply of medicines and medicinal products and the manufacture of and trade in illicit drugs. The Ministry is in charge of implementing international agreements on social security and of developing national health policies related to healthcare financing, health insurance benefits, quality assurance and planning of public healthcare facilities. The Ministry is responsible for establishing hospitals and public health facilities at the national level.[13] Two expert bodies regarding ICT in healthcare were established at ministerial level uniting all the major stakeholders as well as the civil society and experts: the Council for informatics in healthcare and the Committee for healthcare information standards[14].

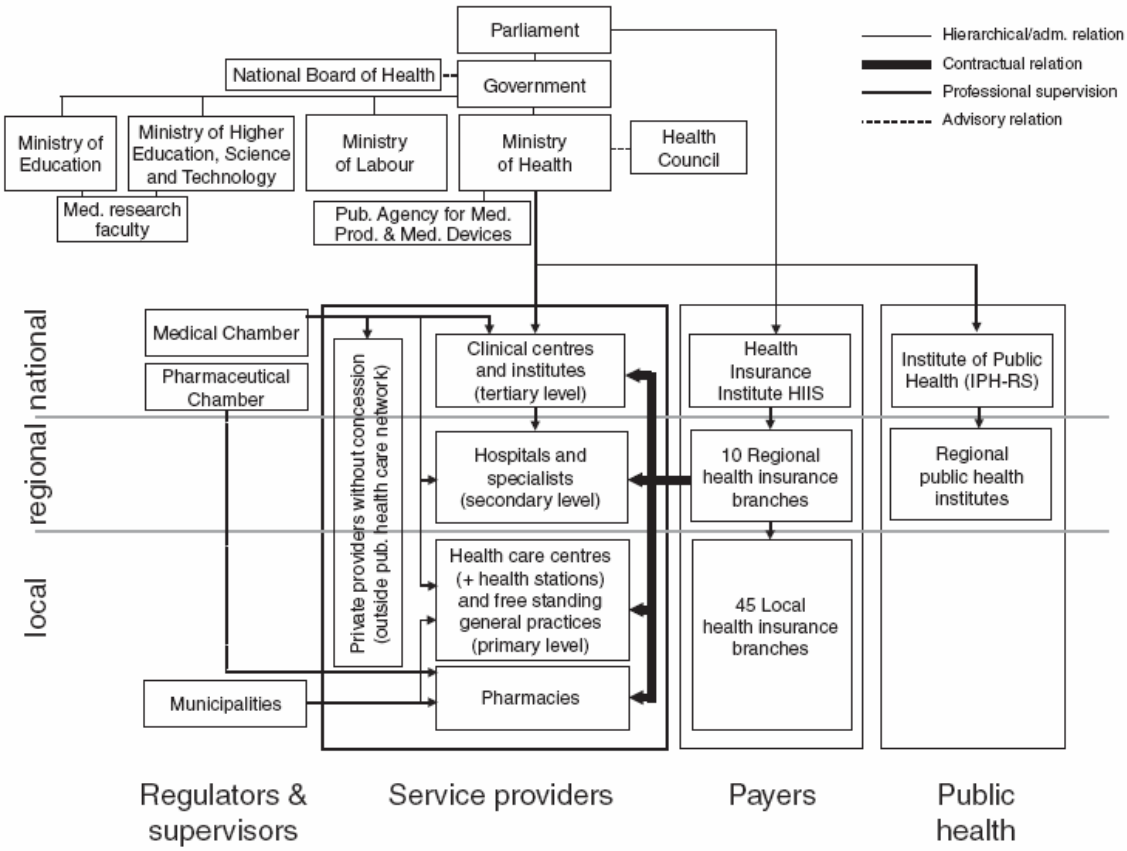
[11] Data from World Health Organization 2000; Health Consumer Powerhouse 2008; World Health Organization 2009

[12] Albreht, Cesen et al. 2002, p.2

[13] Albreht, Cesen et al. 2002, p.13

[14] Ministrstvo za zdravje [Ministry of Health];Svet za informatiko (SIZ) [Information Council] , Ministrstvo za zdravje [Ministry of Health]

Figure 1: Organisational chart of the Slovenian healthcare system[15]



Healthcare service providers

Both public and private providers deliver primary healthcare. Public providers include healthcare centres and health stations. A health station provides as a minimum: emergency health assistance; general practice or family medicine and healthcare for children and youth; family medicine and basic diagnostic services; and is linked to the nearest healthcare centre for more complex primary healthcare services. Healthcare centres are publicly owned by the respective self-governing community. The employees of healthcare centres are salaried but physicians and dentists have obtained the right to have a special contract for private practice. Because of the absence of policies on future development of the healthcare centres and a lack of regulation, the introduction of private practice in primary care has encountered some difficulties.

Under compulsory insurance, patients are free to choose their own physician in primary healthcare, in a healthcare centre or a private practitioner with an HIIS[16] contract. The personal physician is usually a general practitioner. Registration is for at least one year. The personal physician acts as a gatekeeper and refers patients to the secondary and tertiary care level.[17]

[15] Albreht, Turk et al. 2009, p.18

[16] Health Insurance Institute of Slovenia (HIIS)

[17] Albreht, Cesen et al. 2002, p.5-6

Access to secondary and tertiary care services is possible through referral by the personal physician, but cooperation between primary and secondary care leaves much to be desired. Primary healthcare services and hospitals mainly cooperate on referrals and exchanging test results but do not cooperate over care or disease management. Specialist secondary outpatient care is performed in hospitals, spas or private health facilities.

Hospitals provide about 75% of secondary care, either as inpatient or outpatient care. Clinics and institutes provide more complex tertiary healthcare services. There are 26 hospitals, including the main tertiary and teaching hospital, the Clinical Centre in Ljubljana. In addition, there are 12 specialised hospitals. The level of inpatient beds is low relative to both EU and eastern European averages. The occupancy rate has increased over the past 15 years to 85%. The annual national partnership negotiations have resulted in an agreement that hospital beds and staff must be reduced by 1.0–1.5% annually. However, hospitals attempt to fill the excess bed capacity that thus arises through alternative arrangements such as marketing non-standard services.[18]

Figure 2: Important features of primary healthcare organisation in Slovenia

Political/administrative unit responsible for primary healthcare	Responsibility for primary care lies with the municipalities.
Consumer Choice	Patients have free choice of GP with a restricted number of one change per year.
Financing	The system is financed as a compulsory health insurance. The contributions depend on the salary or other income earned by the insured person. This ensures a high degree of solidarity within the system. For some groups of insured persons (the unemployed, the recipients of the social security allowances and similar), the health insurance contributions are paid by national or local community budgets.
Public or private providers	Most of the GPs are publicly employed. But within the last few years there are several private providers with concessions and private providers without concessions.
Gatekeeping function of the GP	Patients first consult a GP. GPs than provide a referral which is used by the patient when consulting a specialist.
Integrating health: initiatives for coordination	Slovenia is currently in the phase of reforming the national healthcare system, so therefore there are some initiatives regarding restructuring national healthcare Several health initiatives for coordination especially in the field of chronic diseases (e.g. diabetes, cardiovascular disease), cancer (DORA - National Breast Screening Programme).

[18] Albreht, Cesen et al. 2002, p.6

2.3 Recent reforms and priorities of health system/public health

Currently ongoing reforms in the health and social care systems

Fundamental reforms aiming to build up a modern health system were carried out in 1992. These consisted mainly of the introduction of compulsory health insurance; an approval process for private practice in the field of healthcare; introduction of co-payments for healthcare services; and a (re-)introduction of professional associations (such as the Chamber of Doctors and the Chamber of Pharmacists).[19] An important part of the reform was moving the major part of the healthcare budget outside of the state to make it more transparent and controllable and its use more subject to its primary intention.[20]

These major reforms were followed by a period of implementation and further adjustments of the health system. Recent reforms included, amongst others, the introduction of the diagnosis-related group (DRG) system for payment of hospital services; development and implementation of patient pathways to enhance quality of treatment; and introduction of a risk-equalization scheme for providers of complementary voluntary health insurance (VHI). Long waiting times, especially for dental services and some specialised services and surgeries remain a problem still to be solved within the Slovenian healthcare system.[21]

2.4 eHealth setting in the country

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[22]*.*

Slovenia shows a somewhat unusual pattern of eHealth infrastructure and use rates. While in terms of ICT infrastructure Slovenia can be considered a solid performer, particularly with regards to the electronic storage of administrative patient data, which is well established.

In terms of infrastructure, 97% of Slovenian GP practices use a computer. 82% of practices dispose of an Internet connection. In Slovenia, broadband connections are quite common; they represent the usual form of Internet access in 54% of the GP practices.

When it comes to the use of eHealth applications, Slovenia shows a very particular pattern. 86% of Slovenian GP practices store electronic administrative patient data. 83% of Slovenian GP practices store at least one type of medical patient data as well.

In Slovenia, computers are used in consultation with the patients only to a very limited extent (18% of the GP practices). The use of Decision Support Systems is fairly well

[19] Albreht, Turk et al. 2009, p.xviii

[20] Markota, Svab et al. 1999

[21] Albreht, Turk et al. 2009, p.xviii

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

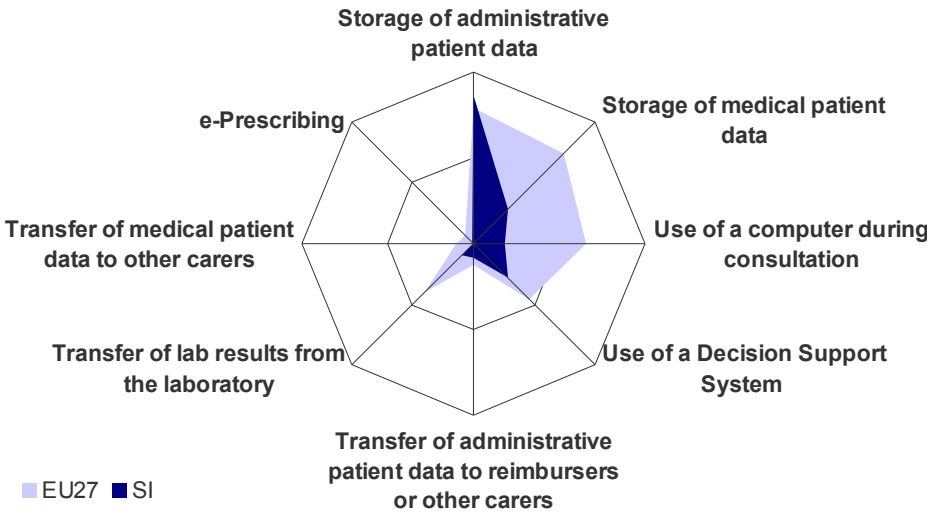
established as 40% of Slovenian GPs use decision support systems either for diagnosis of prescribing purposes.

The electronic transfer of individual patient data via Internet or other network connections has as yet not very much arrived on the agenda of Slovenian GPs. Only 10% receive laboratory results and not a single GP practice exchanges medical patient data with other carers. Neither is the exchange of administrative data via networked connections more common: only 3% of the GP practices participating in the survey reported having exchanged administrative data with other care providers while 14% exchanged administrative data with reimburses.

ePrescribing is still not a reality in most European Member States. This holds true for Slovenia as well where none of GPs having participated in the survey reported using ePrescribing.

The rather low level of eHealth use can be attributed to the fact that this policy field is relatively new in Slovenia.

Figure 3: eHealth use by GPs in Slovenia



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 country survey. In a first section, the eHealth policy actions undertaken in Slovenia are presented. This is followed by a presentation of administrative and organisational measures taken. Section 3.3 presents results on key eHealth applications. Section 3.3.4 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 in the following chapters, 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 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

eHealth strategy "e-Zdravje2010" (2006-2010)

The current Slovenian strategy for eHealth is called "e-Zdravje2010"[23] (e-Health2010) for the period from 2006 to 2010. This national roadmap focuses on eHealth and includes information systems and services, which – when combined with organisational change and the development of new skills – are suppose to contribute to the development of the healthcare sector and bring improvements in access to care and quality of services, as well as in efficiency and productivity. While the general part identifies the current status of ICT in healthcare, the Strategy points out three strategic objectives: set up of the core information infrastructure, integration of the existing information systems on a national level and the promotion of the use of eCommerce in healthcare as a common mean for communication.

The national strategy outlines that eHealth solutions or technologies should support the progress in medical research, better management and the diffusion of knowledge in the medical field and enable to achieve evidence-based medicine. It aims for solutions (technologies) for all stakeholders in healthcare, which supply the patient with the right information in the appropriate form and integrates them in terms of time and health system levels, as well as provide organisation and business data.

The current roadmap also takes into account professional and business challenges of modern European health systems, such as: rising demand for healthcare services due to demographic changes, increasing expectation of patients, management of huge amounts of health information, the need to provide the best healthcare services under limited budgetary (public) conditions and similar issues.

Basically, the Slovenian strategy follows the EU guidelines as outlined in the document "Communication on e-Health – making healthcare better for European citizens: An action plan for a European e-Health area"[24] (2004). It also build upon the previous achievements and existing conditions in the field of information systems in the Slovenian healthcare sector and proposes possible solutions to rectify the deficiencies noted over time.

Thereby, "e-Zdravje2010" is part of a comprehensive document for the period 2006-2013 called the "Strategy of the Republic of Slovenia" (also referred to as si2010) which has

[23] Ministrstvo za zdravje [Ministry of Health] adopted in December 2005

[24] European Commission 2004

been adopted by the Slovenian government in 2005. Important domain strategies and respective stakeholders are defined – the most important being: eHealth 2010 (Ministry of Health), eGovernment (Ministry of Public Administration) and eEducation (Ministry of High Education, Science and Technology). The declared purpose of this policy paper from 2007 is to define a national framework for stimulating the development of an information society in the Republic of Slovenia until 2010 by outlining directions that will take into account technological, societal and legal situations.

Furthermore, si2010 defines principles of action, shows possible domains to be involved and makes detailed suggestions, whereas goals, indicators and measures are left to particular domain strategies. This makes si2010 an umbrella document for different more detailed strategies in Slovenia. Examples for such domain strategies are: the “Roadmap for Economic Development of the Republic of Slovenia”, which also defined the development of an information society as a priority task in 2001. Here, the transition towards a knowledge society has been envisaged as the basic mechanism for increasing competitiveness, which must be supported by policies for human resource development, labour market and employment and the development of an information society, as well as R&D.

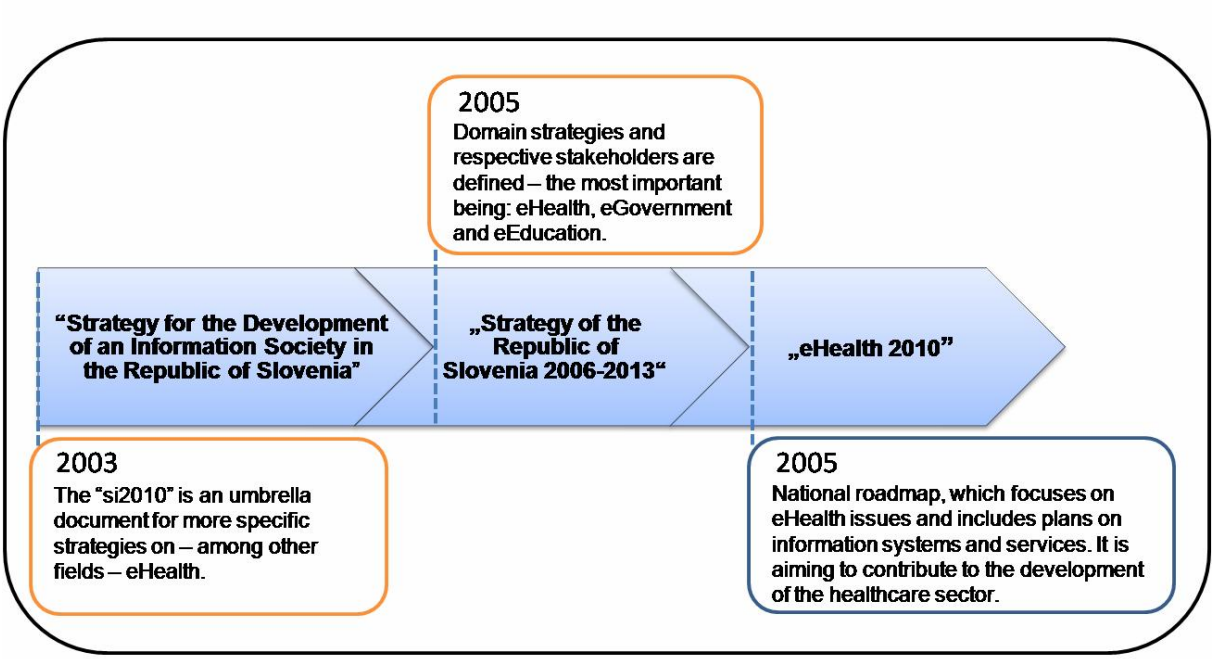
There are other strategies referred to in the si2010 – but not closely related to eHealth: these are dealing with e-Education and broadband networks.

Main goals of the development strategy for the information society are to accelerate further development of information society that is aiming to significantly influence innovativeness of the Slovenian economy and society in general, to increase employment in industries with a high added value, to increase the quality of life and to provide a balanced regional development.

Speaking of regions, there are no regional documents concerning eHealth, because Slovenia has not established any regional authorities or governments and therefore everything is discussed and decided at the national level.

Figure 4 summarises the three most important policy documents in chronological order.

Figure 4: Slovenian Policy Documents related to eHealth



3.2 Administrative and organisational structure

Plans to launch the "Centre for Health Informatics of the Republic of Slovenia"

Currently Slovenia has not established a special institution for eHealth, but the development of such a "Centre for Health Informatics of the Republic of Slovenia" is in a planning stage. A framework for the development was outlined several years ago and recently led to action by the Ministry of Health, as key posts (e.g. general manager, expert for standards and interoperability, expert for information security, experts for help desk) were appointed. The goal is that concrete plans are finished within the last quarter of 2010 and that the centre then can develop through the years to meet the deadline in 2015.

The Centre for Health Informatics will be the main body that leads, supervises and coordinates the majority of the professional informatics required to support the Slovenian health system at the national level. The mandate of the centre is 1) to support and enable the achievement of the Slovenian health sector goals by improving the quality, value, availability and accessibility of health information and 2) to provide proactive leadership in the cost effective use of informatics at the national level of the Slovenian health sector.

The scope of activities of the future centre are mainly focusing on managing eHealth infrastructure (solutions, services, IT infrastructure), project management of eHealth projects, contract management and the definition of informatics standards, which are required and undertaken at the national level. This includes those activities that are in common for all entities, agencies and institutions within the healthcare system, but not those, which are unique to an institution or to a local or regional entity/agency. In general, the centre provides support for unique local agency needs on request and with approval of the centre's governing body.

Thereby, stakeholders are included in several ways:

Stakeholder Integration in Slovenia

Stakeholder views are integrated…

- as informal consultation and exchange of opinions, knowledge, experiences and professional support
- as part of temporary working groups – the Ministry of Health has set up an eHealth project organisation, which includes more than 50 members which represent key stakeholders from different areas
- as representation in official decision making bodies such as the eHealth Project Council

The Centre for Health Informatics, as drafted above, will be financed by the European Social Fund and the Budget of the Ministry of Health. Challenging aspects regarding the development of the centre are of legal and organisational nature. The legal hurdles reflect the fact that a complete legislative framework is missing up to this point, but this is planned to be established by the end of 2010.

3.3 Deployment of eHealth applications

3.3.1 Patient summary (EHR)

In this study, the epSOS project's definition[25] 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.

[25] European Patients Smart Open Services

Feasibility study for EHR and patient summary deployment

In Slovenia, no basic patient summary exists, but is planned to be set-up in 2011. The same status is applicable for a national electronic health record (EHR). The Ministry of Health has – up to this point – done a feasibility study, which includes the development of a patient summary and an electronic health record. The action plan of this study envisions the gradual supplement of a patient summary within the coming year.

Referring to the action plan, different workshops will be organised by the Ministry of Health. Participants will for example include doctors, professionals, IT experts, healthcare specialists, nurses, experts for standards. The project for the set-up of a patient summary is closely connected to other activities and projects within the national eHealth plan (e.g. eDocuments, eReferal or the national electronic health record).

It is the intention of Slovenia to include a patient summary on the (new) Slovene Health Insurance Card. Together with the personal data and insurance it will provide all relevant basic health data, diagnostics, vaccine treatment, chronic diseases, allergies, injuries, disabilities, addiction, operative treatment, work restrictions and issued medicine. The card is currently being rolled-out and in accordance with government plans, that roll-out should be completed in the course of 2010[26].

A legal basis for the inclusion of such a patient summary on the Health Insurance Card can be found in the Healthcare Databases Act. This act explicitly mentions the inclusion of summaries on the HI card in the Annex, database no. 2[27].

Challenges

With regard to a nationally stored patient record, however, legal changes are still required. The current legal framework does not allow to store and manage the data at a centralised or national level. Patient data can only be stored at the particular point of care. The Ministry of Health is in the process of preparing revised legislative acts, which will then provide an adequate legal framework for a national patient summary and the electronic health record.

Other major challenges are closely related to organisational issues. At the time, the Ministry of Health started an EHR/patient summary project, it faced different execution problems: key stakeholders (doctors, nurses, health insurance, managers and the Ministry of Health) could not reach an agreement on what kind of patient data would be stored in the patient summary and the electronic health record. Challenges are also related to the structure of the EHR, as the question is raised, if data will be stored in a centralised or decentralised manner. Stakeholders have not reached an agreement on this issue yet.

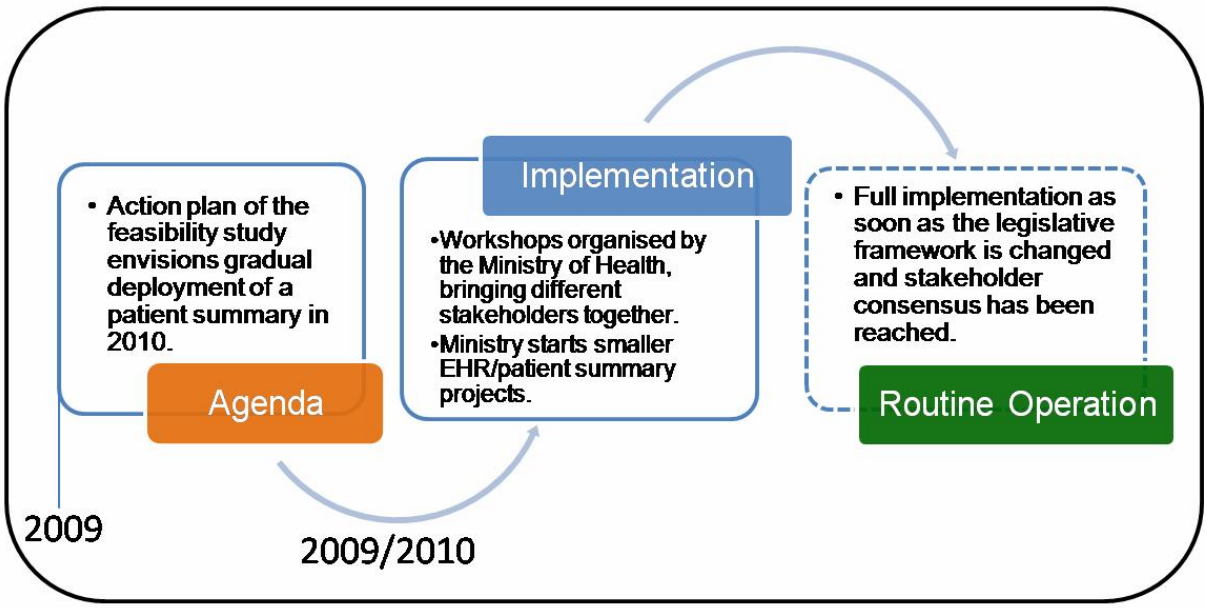
Slovenian stakeholders believe that as soon as an appropriate legislative framework is provided and a consensus is reached on the patient summary and EHR type, most of the problems will be solved and technical issues will just be a matter of secondary importance.

Figure 5 below outlines the most important steps in the development of a patient summary and an electronic health record.

[26] For more information on the Health Insurance Card and its developments, see: Health Insurance Institute of Slovenia , http://www.zzzs.si/zzzs/internet/zzzseng.nsf/o/281454A83B407BC8C1256EB4002DFBC2

[27] Državni zbor Republike Slovenije [National Assembly of the Republic of Slovenia] 2000

Figure 5: Patient Summary in Slovenia



3.3.2 ePrescription

In the framework of this study and following work in epSOS[28], 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.

Ongoing workshops for implementing ePrescription

The Slovenian Ministry of Health, the Chamber of Pharmacists, the Agency for Medical Products and Medical Devices of the Republic and other stakeholders have started to plan the implementation of ePrescription in form of workshops. ePrescription will include the eTransmission of a prescription to the pharmacy and a medication record. The estimated date for the beginning of the implementation is 2012.

Main challenges concerning ePrescription are similar to the ones mentioned in relation to EHR and patient summary. They are as well dependent on the current legislative and organisational framework, which has an effect on ePrescription as data cannot be stored on a national level due to law. However, general rules on prescriptions are mainly governed by the Rules on classification, prescribing and dispensing of medicinal products for human use. These rules explicitly allow the possibility to use electronic prescriptions[29].

Similarities to the challenges mentioned in relation to EHR and patient summary can also be found in the fact that for ePrescription stakeholders cannot agree on a common set of data, which is included in the medication record of the patient. Also, the matter of decentralised or centralised data storage has not been resolved yet. Foremost, the goal

[28] European Patients Smart Open Services

[29] Državni zbor Republike Slovenije [National Assembly of the Republic of Slovenia] 2008

is to reach consensus on the legislative framework and data storage in order to concentrate on technical issues.

3.3.3 Standards

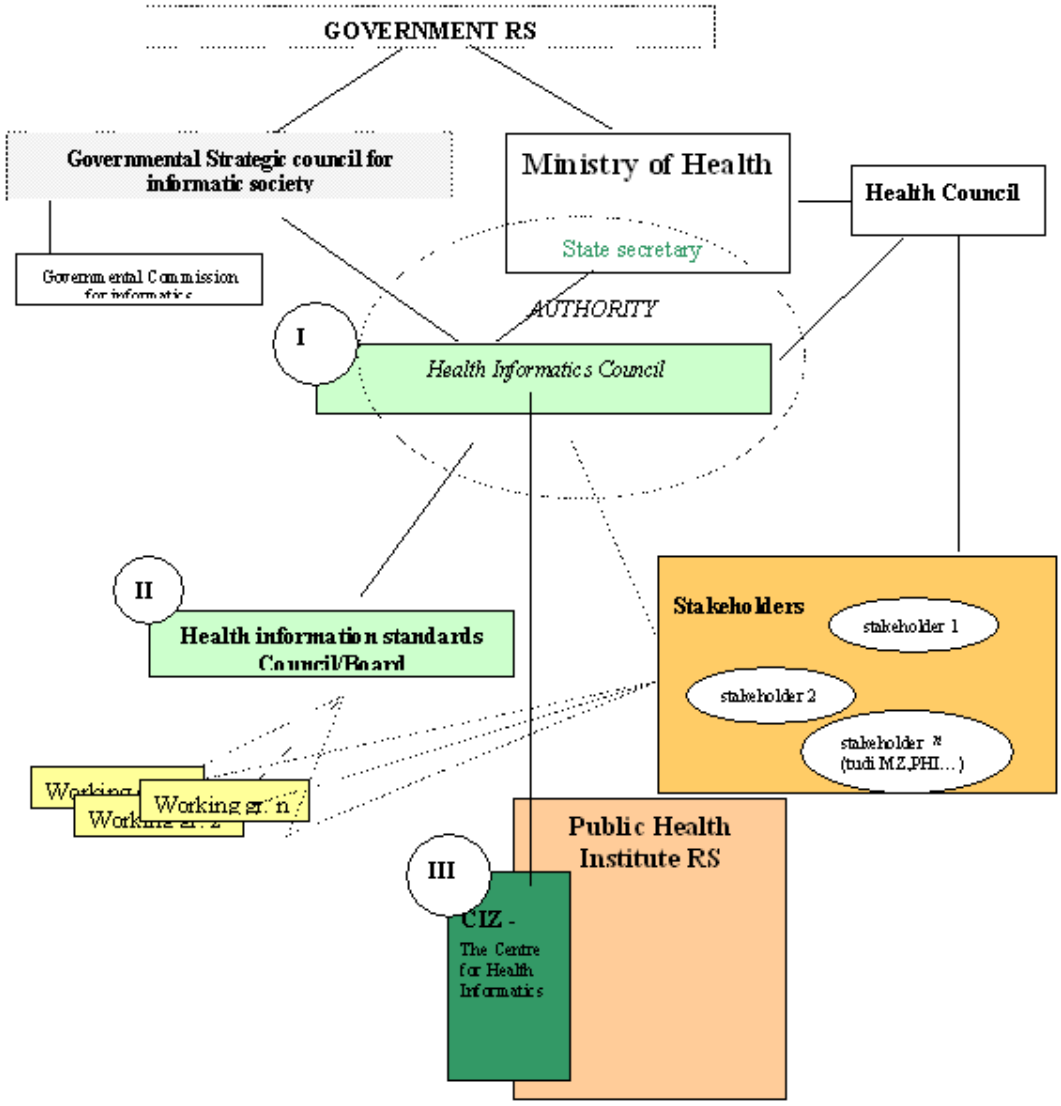
Standards are not only crucial to enable interoperable exchange of meaningful information in the healthcare system; they also ensure secure access to patient records by healthcare providers and citizens. This study aims to identify, among other usage, standards related to the domain of health informatics,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

Health Informatics Standards Board

In Slovenia, the national competent authority currently dealing with standards is the "Health Informatics Standards Board". It is the Slovenian governing body for the health informatics capability. The need for and the benefits from such a board are widely accepted in the country. The Board derives it authority from the Health Informatics Council.

It should be noted that the Council is one of three key components of the national health informatics capability (the other components being the Health Informatics Standards Board and the Centre for Health Informatics). The inter-relationships of these components and their inter-relationships to other health sector entities are shown in the figure below.

Figure 6: The Slovenian eHealth governance structures



Challenges

All Slovenian stakeholders for eHealth rank the current lack or different interpretation of codes, classification, security and share, as well as the presentation of health information as one of the main barriers to reforming and improving the management plan and the delivery of services within the system. Without the adoption of a set of core standards and information exchange, it seems that it will be difficult or even impossible to provide information accuracy, integrity, security or cost effectiveness.

In particular, the health sector reform of the reimbursement system and the introduction of clinical pathways in order to improve streamline health service delivery is largely affected by the lack of national health information standards. At this point, the Health Informatics Standards Board is the main body for the establishment of such health informatics, which are required by the Slovenian health system. Thereby, the board is one of three key components of the of the national health informatics capability – the other actors being the Health Informatics Council and the Centre for Health Informatics.

The field of responsibilities of the Standards Board includes activities undertaken at the national level, for example the application of standards which are common in all entities, agencies and institutions within the health system. The Board's scope does not include those informatics standards, which are unique for one institution or are related to a regional entity/agency.

The Board will further engage in the identification of standards and guidelines, which promote and enable effective and efficient health information sharing. In most instances, this focus will result in standards and guidelines for the areas of data (e.g. data definitions, coding schemes), technology (e.g. data communication) and security (e.g. encryption).

The Board has the authority and responsibility to:

Responsibilities of the Slovenian Health Informatics Standards Board:

The Board has the responsibility to:

- consult with a broad range of health sector stakeholders to establish priorities for national health informatics standards
- review existing national and international standards for applicability to Slovenian issues – this is due to the fact that the current plan foresees that Slovenia should not develop its own standards and guidelines, but rather adopt them from other jurisdictions
- establish and coordinate the activities of expert level working groups that will pursue the work of developing or reviewing specific standards for the use in Slovenia
- develop and manage processes that encourage a consensus between relevant interest groups regarding most appropriate/practical standards and guidelines, which are in line for adoption
- make recommendations for the Health Informatics Council regarding specific health information standards and guidelines, which are appropriate for the use at the national level in Slovenia
- publish, promote and provide education related to health information standards and guidelines
- act as a focal point and discussion forum for national health information standards issues and for the linkage to international health informatics standards activities
- ensure processes of certification and/or accreditation of products and services employing standards
- monitor stakeholder compliance with national informatics standards, which were approved by the Council
- report the status of compliance to the Health Informatics Council

Slovenia is a member of the International Health Terminology Standards Development Organisation and HL7. We have already included ICD 10 classifications. Nevertheless Slovenian Ministry of Health, have already implemented HL7 v3; Ballot: September 2006 Standard within LabPostar pilot project. LabPostar is an information solution for a secure electronic data interchange between healthcare service providers and microbiology

laboratories. For future project the Slovenian Ministry of Health will also implement HL7 CDA standard and IHE profiles.

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"[30]. 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[31].

Project "Tele-medicine in COPD patients home management"

Currently there are no telemedical services implemented at the national level in Slovenia. However, there are some pilot projects in the field of telemedicine carried out by specialised hospitals. The main project for this field is the "Telemedicine in COPD patients home management", which is conducted by the University Clinic of Pulmonary and Allergic Diseases in Golnik.

The only national policy or implementation programme for telemedicine is the "National Standard for Teleradiology", which was prepared for a pilot project of the National Teleradiology Network. These standards are based upon US standards for teleradiology.

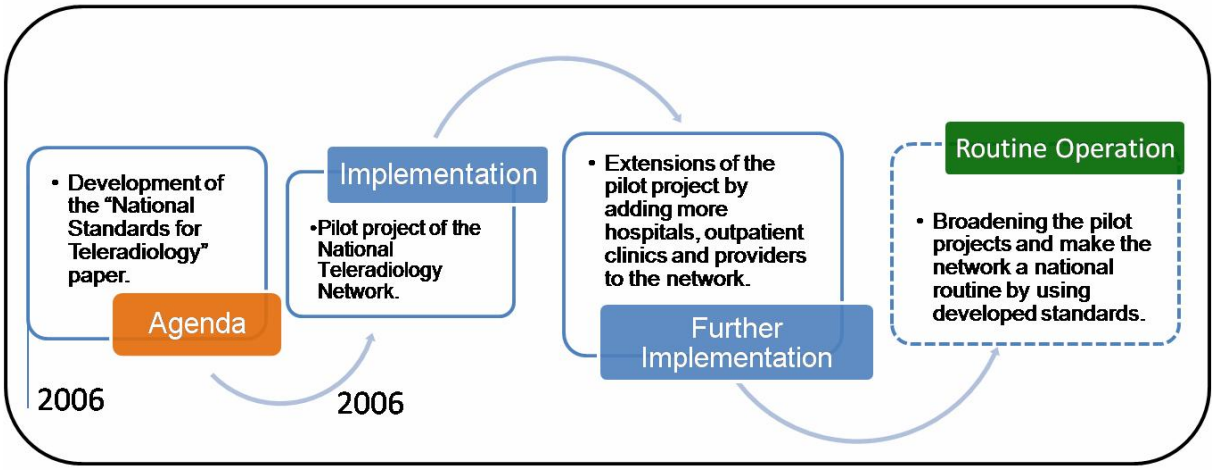
As outlined in the sections in standards (3.3.3) and patient summary (3.3.1), the legislative and organisational framework in Slovenia does not meet the demands of the implementation process of different applications such as telemedicine. With regards to telemedicine specifically, two major problems occur: first of it seems that the in 2008 adopted act on patients' rights could represent a major obstacle for performing telemedicine in Slovenia[32]. Further, Article 20, §2 states that "a patient has the right to be informed on every aspect of his health status directly, in person, by the responsible physician, who has a respective obligation. Secondly the problem of data storage at the national level remains and stakeholders will have to agree upon the way of data storage (centralised/decentralised) and its components.

[30] Europe's Information Society

[31] European Commission 2008

[32] Državni zbor Republike Slovenije [National Assembly of the Republic of Slovenia] 2008

Figure 7: Telemedicine Services in Slovenia



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 Slovenia and for which purpose.

3.4.1 Unique identification of patients

Health insurance card as smart card

Slovenia was amongst the first countries to introduce a Health Insurance card (HI card). The health insurance card system was designed in 1996 and fully introduced at the national level in 2000. The HI card is a smart card of the size of a bankcard. It does not carry a picture. The card was well received by all users of the system: insured patients, health service providers and all four insurance companies and its use has become a matter of routine and is therefore fully incorporated into the Slovenian health system. The use of the card is twofold: on the one hand it is used as a unique identification document, on the other hand it is used to verify the patient's insurance status and check his medical data. The data are being updated by the card holder autonomously through self-service terminals installed throughout the national territory.

Despite constant updates and functional expansion, the card – and especially the information technology – has to be checked and updated after a longer period of use in order to meet modern technological and other (e.g. legal) demands and to facilitate further development. Therefore, the Health Insurance Institute for Slovenia prepared a

concept in 2006, which is concerned with card system updating and, in accordance to the concept, is gradually modernising the card system[33].

The health insurance ID card is based upon a national electronic registry for health insurance purposes, which is managed by the Health Insurance Institute of Slovenia, the ZZZS (Zavod za zdravstveno zavarovanje Slovenije).

Apart from the Health Insurance card, Slovene citizens also have a personal ID card. The idea of merging the two cards was already raised, but up until now the government failed to prove any risk analysis on data protection and produce any relevant reasoning for the elaborated accessibility to different controllers. Thereupon the plan was set aside.

3.4.2 Unique identification of healthcare professionals

Different professional identifiers

Unique identification of healthcare professionals was established several years ago within the National data base of Healthcare Providers, which contain basic records of healthcare providers and professionals with unique identifier. The data base is managed and owned by the National Healthcare Institute.

3.4.3 The role of eCards[34]

Health insurance cards for citizens and healthcare professionals

The eCard system in Slovenia mainly consists of Health Insurance Cards (HIC), which includes the health insurance card for citizens, the health professional card, a self-terminal network, a central computer system and data collection tools of the compulsory health insurance companies on special servers.

The health insurance card for patients is a microprocessor card with a 16 KB memory capacity. Reading and modification of data on the card is subject to strict protection, requiring the health professional card (see below), as well as dedicated hardware and software. The card carries a copy of data from the central database. When data is updated through a self-service terminal, the modified data is then transferred from the central database to the card.

The card holds electronic records of the following data items:

[33] See above: 3.3.1

[34] Bolka 2009

Data stored on the Slovenian Health Insurance Card:

- card holder information (name, surname, address, sex and date of birth)
- health insurance contribution obligor (registration number, title, address, type of contribution obligor)
- compulsory health insurance (validity data)
- voluntary health insurance (insurance provider, type of policy, validity data)
- selected personal physician (general physician/paediatrician, dentist, gynaecologist)
- issued medical technical aids
- voluntary commitment to posthumously donate organs and tissues for transplants
- issued medication

The above mentioned (3.4.2) professional IDs are closely related to the Health Professional Card. It is for professional use only and allows the owner to access the data, which is required for his/her work and within the domain of his/her competencies. The card is issued to doctors, medical nurses, administrative officers at the reception, pharmacists, physiotherapists and other healthcare workers and authorised officers of e.g. health insurance companies.

Health professional card as smart card for access to patient data

The HPC is a smart card with a 8kb microchip and bank card format without a photo. The holder identifies himself on a special card reader with a provided personal PIN. In general, a HPC is submitted to every healthcare worker interacting with patients and to certain insurance referents. HPC is used in order to be able to read a personal HI card. The HI card can be accessed only if both cards are used at the same time through a special software.

Renovation of health cards planned

According to the plan of the Ministry of Health to gradually modernise health cards[35], the professional card is also updated: At the moment, development and introduction of a new professional card for healthcare workers (Java Card) is ongoing, which will contain digital certificates enabling a secure electronic communication. The new professional card for doctors and pharmacists will also hold a qualified digital certificate, which provides an electronic signature procedure.

Fully implemented, this new card will be used for the ID establishment and identification of healthcare workers, as well as to ensure secure communication and an electronic signature. A new function related to the card and for the possibility of storing certificates, will be the protection of online access to data stored in central databases and secure electronic signing (e.g. electronic prescription and other electronic solutions). It will also preserve all functions of the current card.

The new professional card itself constitutes an important security element in the electronic health system. Security mechanisms related to the card are the following: the

[35] The same trend for modernisation of cards can also be found in the guidelines for the future electronic European Health Insurance Card and in the development plans of individual member states. The HIC system renovation is directly linked to the adoption of the Slovenian policy strategy “eZdravje2010”.

stored data is written on a chip, which is placed on the card in two sets. The first set (in the “compatibility applet” on the chip) contains all data which has already been stored on the old one. The other set (in the “IASE applet” on the chip) stores digital certificates. Each health professional card (HPC) has a (regular) digital signature, enabling the card owner to safely access data stored in the online system. In addition, professional cards for doctors, dentists and pharmacists also contain a qualified digital certificate, providing the user with a safe electronic signature, for example when prescribing a medicine or issuing a medical preparation.

Digital certificates and professional cards are valid for five years from the day of issuing. After a health professional card has been issued, new or additional data /digital certificates cannot be uploaded.

The Health Insurance Institute is issuer and system operator for the health professional cards. It has established processes for the implementation of digital certificates and a system control for the HPCs. For this purpose, the Institute has developed its own application software support, in which one of the most important tasks is the establishment and management of the HPC holder registry. The registry contains integral data on card owners and their digital certificates (e.g. data on issuing, cancellation). It is also directly linked to an authorisation scheme for access to individual data sets in the online system.

In general, the certification system has a dynamic structure, allowing simple and fast allocation of professionals, as well as the cancellation and changing of individual groups of system users and their authorisation. The procedure of issuing and managing a new HPC and of the certificates it contains, are substantially more complex than current procedures, because of the key role of HPCs in the overall system.

The most important change concerning users is the personal registration of doctors and pharmacists for HPC acquisition. The use of a regular digital certificate on a professional card is protected by a 4-character password, which must be entered by the card holder upon registration. An electronic signature (e.g. for electronic prescription) on the basis of a qualified digital certificate is protected by a 6-character password, defined by the user.

The key architectural components of the system are:

Key architectural components of the Slovenian Health Professional Card:

- Entry point: a set of central server services for the management of secure communication channels, user identification and authentication, insured persons identification, control of identification procedures and the routing of requests to back-end systems
- Back-end systems of HIIS[36] and the three voluntary health insurance companies: server services for the provision of data or storage of transmitted data and the management of complete records of access
- Software libraries: enable simplified adaptation of healthcare applications for the use of online systems

Secure communication will be ensured by using corresponding channels. The entry point and the back-end systems will be set up by using web service technologies. During the development of data transmission within the system, the HIIS will draw a great deal of attention towards data security and the security of the whole system. Reliable and secure provision of the data is seen as a key element for healthcare services.

As mentioned under point 3.4.1 above, the identification of patients is linked to the Health Insurance Card for Citizens. The Slovenian healthcare system provides the insured citizens with a smart card and has set-up data links between the healthcare service providers and the health insurance providers in 2000. There are three voluntary health insurance providers:

- Adriatic Slovenica (http://www.adriatic-slovenica.si)
- Triglav, Zdtavstvena zavarovalnica (http://www.zdravstvena.net)
- Vzajemna (http://www.vzajemna.si)

The health insurance card system, effectively combining the smart card technology and network services, brought the following benefits:

Benefits of the Health Insurance Card System in Slovenia:

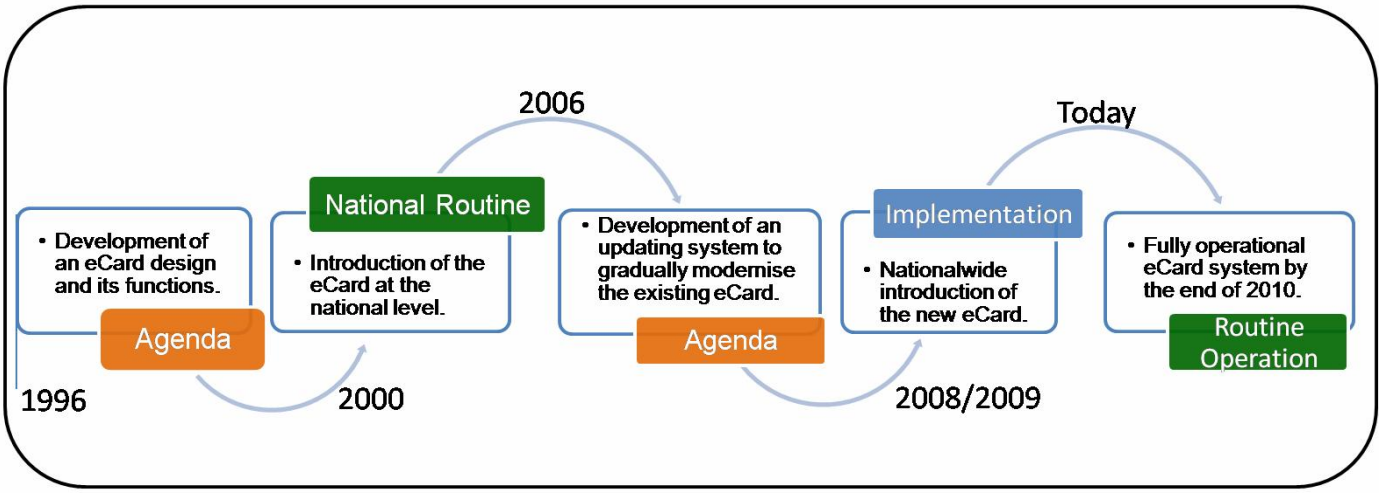
- reliable identification of an insured person at all healthcare entry points
- improvements in data flow between all the involved actors (insured persons, healthcare service providers and health insurance providers)
- higher levels of data privacy and security
- strengthening of IT literacy among the healthcare workers
- higher operational efficiency and reduction of the volume of administrative tasks, to allow more time to the healthcare service providers to engage in professional tasks

The key architectural components of the health insurance card for citizens are similar to the one for health professionals. The two data sets of the health professional card also apply to the citizens' card. They are defined as offline and online data. In addition, the citizen card also contains space for downloading additional digital certificates, which will be used by each user individually.

[36] Health Insurance Institute of Slovenia.

The development and implementation of the eCard in Slovenia can be traced below:

Figure 8: eCards in Slovenia



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.

Specific provision on the use of ICT in health

In Slovenia, little specific provisions on the use of ICT in health exist. However, with the roll-out of the new health insurance cards as a driving force, legal changes are expected. A law on eHealth records and data storage for example is in the process of enacting. Currently, the Ministry of Health is in the initial phase of updating the "Certificates and Registries in Healthcare" Act. As only a draft of the modernised law exists, there is no official name or number for it at that time.

With regards to telemedicine, on the contrary, Slovenia is not planning to enact specific legislation and/or a regulatory framework related to the use of telemedicine services. But the above mentioned healthcare act, which is currently in a drafting phase, will also cover processes related to telemedicine services.

There is no specific accreditation scheme for healthcare professionals who deliver telemedicine services, but the Ministry of Health is planning a certification or accreditation

scheme for the entire healthcare sector – especially for IT systems and solutions, as well as specific points of care, where data will be stored and managed.

With regards to data processing, the Slovene Personal Data Protection Act from 2004 is applicable[37]. The law has a technically somewhat different legal approach that the European Directive 95/46/EC, but is nevertheless a quite literal transposition. With regards to access rights the Slovene Personal Data Protection Act states that the data controller should not only enable the data subject to consult his own data, but also the full filing system catalogue.

3.5.1 Patient rights

Patient Rights Act (2008)

The rights and duties of patients and healthcare providers have only recently been regulated in the Patient Rights Act (Zakon o pacientovih pravicah, ZPacP 15/2008). The law defines the basic rights of the patient, their relatives and the respective duties of healthcare providers. New institutions were furthermore established and procedures for the enforcement of rights regulated.

The Patient Rights Act explicitly provides the patient with the right to a medical record which is carefully updated and safely stored by the health professional. The right to access this record is provided in both the Patient Rights Act and the Personal Data Protection Act. The patient has the right to access and read his/her patient record, but is not allowed to make any changes or enter additional information. It also provide patient representative with the possibility to access records, which are available up to this point, since a national electronic patient record has not been created. All aggregated data is made anonymous. Within the law it is already foreseen that patients could access their medical records on-line via the Health Insurance card when technically possible.

3.6 Financing and reimbursement issues

In general, Slovenian eHealth projects, which include the implementation and long-term maintenance of the infrastructure, are financed by four major sources:

- European Social Fund (structure 85/15), which provides funds until the first half of 2015 and represents 18.1% of the financial sources
- National Budget for Cohesion Policy (EU funds structure 85/15), which also assigns funds to projects until the first half of 2015 and represents 3.2% of the financial sources
- Budget of the Ministry of Health (national budget) provides necessary resources until the end of the investment phase in 2023 and represents more than half (55.8%) of the sources available
- Other public sources, which include financing sources of healthcare providers, sum up to 22.9 % of the funding

The estimated value of the current Slovenian eHealth project (including implementation and long-term maintenance) lies at about 67.6 million €. The amount of eHealth

[37] Personal Data Protection Act (Zakon o varstvu osebnih podatkow, ZVOP-1-UPB1 94/2007)

investment (including implementation and long-term maintenance of the national eHealth infrastructure) adds up to approximately 133 million €.

There are also different public budgets assigned to eHealth activities, such as: planning, pilots, project management, long-term management, procurement costs and implementation costs.

The budget is divided into a 1) National Budget for Cohesion Policy; 2) Ministry of Health Budget and 3) other public funds. Each budget provides a different amount of financial support and is planned for a different period of time. It is defined as followed:

Slovenian eHealth Budget in 2009 and estimated future budget:

National Budget for Cohesion Policy:

The amount for 2009 was 574.800 € and the planned amount from 2010 up to 2015 lies at about 4.764.083 €, whereas the budget size decreases over time.

Ministry of Health Budget:

In 2009 the amount spent was 318.372 € and the estimated amount for the coming 13 years lies at about 71.035.501 €.

Other Public Funds:

Funding from other public funds add up to 569.395 € in 2009. For the next 13 years the estimated budget is 30.229.690 €.

In Slovenia, main challenges concerning the financing and reimbursement of eHealth at the national level are mostly related to legal matters: they are a result of the current legislative framework for budget planning and financing, since it presumes only a two year budget plan. This implies that contracts with service providers can only be signed up to a maximum of three years. This is not consistent with the Ministry of Health, as they would like to establish long-term partnerships with service providers. The option of public-private partnerships has been considered, but there is, on the one hand, a strong opposition towards these kinds of contracts and, on the other hand, there are only poor pilots which could be used as model activities.

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.

Plans by the Ministry of Health for evaluation

The Slovenian Ministry of Health is planning to evaluate different components of the eHealth system, such as the different types of eCards (health professional/ patient as qualifier) and the interplay of various infrastructural components, as well as the overall system. The Ministry has already started some real-life evaluations of a pilot project for a messaging system (workflow engine) between hospitals and microbiology labs. The pilot phase of the project has almost come to an end and the Ministry is planning to further evaluate the application throughout the coming 24 months.

Another pilot project, which will be set-up this year (2010) in the field of teleradiology, will also be evaluated for 24 months. This project gives hospitals the possibility to exchange radiology data and studies, as well as encourages a direct communication of hospitals and radiology experts.

These projects were included in the eHealth feasibility study in order to gain insight into the acceptance of eHealth services by the public or professionals and to assess the suitability of the chosen technology.

Another prospective evaluation is the assessment of the health insurance card, on which the National Health Insurance Institute will have to provide a detailed technology and cost-benefit analysis.

4 Outlook

Many developments in recent years have changed the Slovenian eHealth system in terms of its legal framework, eCards for patients and healthcare professionals as well as health applications. An example is the launch of a dedicated institution for health standards, the "Health Informatics Standards Board". Furthermore, there are several services deployed on a smaller scale, which will be expanded within the coming two years, e.g. the stakeholder workshops on ePrescription in Slovenia.

Currently, the implementation of a new eCard for patients and healthcare professionals is ongoing. But further eHealth applications or services, such as telemedicine, are facing the challenge of an outdated organisational and partly legal framework, regarding data storage and management.

In sum, important issues for future developments will be the conduction of pilots, which have to be supported by a more regional organisational framework and legal obstacles have to be addressed in order to create a comprehensive eHealth structure with applications, such as patient summary and telemedicine.

5 List of abbreviations

DRG	Diagnosis Related Group
EC	European Commission
EEA	European Economic Area
EHR	Electronic Health Record
EMR	Electronic Medical Record
EPR	Electronic Patient Record
epSOS	European patients Smart Open Services
ERA	European Research Area
EU	European Union
GDP	Gross Domestic Product
GP	General Practitioner
HCP	Healthcare Provider
HIIS	Health Insurance Institute of Slovenia
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
IT	Information Technology
LSP	Large Scale Pilot
OECD	Organisation for Economic Co-operation and Development
PHS	Personal Health System
R&D	Research and Development
SNOMED	Systematized Nomenclature of Medicine-Clinical Terms
VHI	Voluntary Health Insurance
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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