eHealth Strategies

Country Brief: Slovakia

Authors: P. Kováč, S. Giest, J. Dumortier, J. Artmann

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About the *eHealth Strategies* study

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

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Reviewer Names

Pavol Rieger, Vladimír Hučko, Michal Danilák and Peter Gschwendt.

Contact

For further information about this study or the *eHealth Strategies* project, please contact:

empirica	eHealth Strategies	
empirica Gesellschaft für Kommunikations- und Technologieforschung mbH Oxfordstr. 2, 53111 Bonn, Germany Fax: (49-228) 98530-12 info@empirica.com	***eHealth Strategies*** c/o empirica GmbH Oxfordstr. 2, 53111 Bonn, Germany Fax: (49-228) 98530-12 eHStrategies@empirica.com	**European Commission** DG Information Society and Media, ICT for Health Unit Fax: (32-2) 02-296 01 81 eHealth@ec.europa.eu

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Table of Contents

1 Introduction to the report 6
1.1 Motivation of the eHealth Strategies study 6
1.2 Survey methodology 7
1.3 Outline 8
2 Healthcare system setting 9
2.1 Country introduction 9
2.2 Healthcare governance 10
2.3 Recent reforms and priorities of health system/public health 14
2.4 ICT use among general practitioners 16
3 eHealth strategies survey results 18
3.1 eHealth policy action 18
3.1.1 Current strategy/roadmap 18
3.2 Administrative and organisational structure 22
3.3 Deployment of eHealth applications 26
3.3.1 Patient summary (EHR) 28
3.3.2 ePrescription 30
3.3.3 Standards 30
3.3.4 Telemedicine 31
3.4 Technical aspects of implementation 32
3.4.1 Unique identification of patients 32
3.4.2 Unique identification of healthcare professionals 33
3.4.3 The role of eCards 34
3.5 Legal and regulatory facilitators 34
3.5.1 Patient rights 36
3.6 Financing and reimbursement issues 37
4 Outlook 37
5 List of abbreviations 39
6 Annex 40
6.1.1 Annex 1: Compound indicators of eHealth use by GPs 40
7 References 41

Executive Summary

In Slovakia the document “Strategic Goals of eHealth” is a key tool of public governance and informatisation in the area of healthcare”. It specifies the main strategic goals to be obtained through putting the main eHealth applications to work. The document was published by the Ministry of Health and approved by the Government of the Slovak Republic on 16th of July 2008. The goal of the document is the creation of conditions for the realisation of an eHealth and modern healthcare programme.

In order to understand Slovakia’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 Slovakia’s position:

At this time, Slovakia does not have a fully developed patient summary, but it is taking part in the European epSOS project, where the specification for patient summary has been done and which will be enlarged in the future to obtain the full electronic health record (EHR). A national registry of elementary health data has been created (Act No. 576/2004) and its extension is in planning. Also at the planning stage is the development of condition-specific summaries.

ePrescription services are planned to be introduced during the first wave of eHealth projects.

In Slovakia the National Health Information Centre NHIC is responsible for standards inside the eHealth area. The project connected to that responsibility is called Unified Reference Data Base and covers all activities related to eHealth standards. At this stage, ICD 10 is routinely used in Slovakia and the use of CEN EN 13 606 (electronic health record communication), HL7 (health level 7) and DICOM (digital imaging and communications in medicine) are recommended. Slovakia is also a member of the IHTSDO organisation.

Broader introduction of Telemedicine services in Slovakia is planned for the second wave of the National eHealth programme.

List of Figures

Figure 1: Trends in healthcare in Slovakia 13
Figure 2: Important features of primary healthcare organisation in Slovakia 14
Figure 3: Healthcare funding in Slovakia 16
Figure 4: eHealth use by GPs in Slovakia 17
Figure 5: Slovakian policy documents related to eHealth 22
Figure 6: Patient summary in Slovakia 30

1 Introduction to the report

1.1 Motivation of the eHealth Strategies study

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

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

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

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

[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

practices in eHealth"[7] 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 Slovakia 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 report on Slovakia, Peter Kováč provided information on policy contexts and situations, policies and initiatives and examples for specific applications. He is a member of the law faculty staff at Trnava University. In addition, he is the Chief Legal Officer in Slovakia for ESET[8]. ESET develops software solutions that deliver instant, comprehensive protection against evolving computer security threats. Information was enhanced by Mr. Vladimír Hučko, Director of National Health Information Centre (NHIC), Michal Danilák, one of the eHealth authors in Slovakia, Peter Gschwendt, Director of Communication and Education Division (NHIC) and Pavol Rieger, Head of International Cooperation Department (NHIC).

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

1. National eHealth Strategy
2. eHealth Implementations
3. Legal and Regulatory Facilitators
4. Administrative and Process Support
5. Financing and Reimbursement Issues
6. 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

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

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 the Slovak Republic 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 *Slovakian* 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]

In Slovakia, the government is the supreme executive body. The government consists of the Prime Minister, deputy Prime Minister(s) and ministers. It is responsible for the exercise of governmental powers to the National Council of the Slovak Republic. The National Council may take a vote of no confidence at any time.

Further, Slovakia has a "dual system" of public administration, which means that public organisation is divided into state administration and self-government. The most important bodies of state administration are the Office of the Government of Slovakia and the 14 Ministries. To facilitate the progress of the information society, the Slovak government has created the position of "Plenipotentiary of the Government for the Information Society", acting at the Slovak Office of the Government[10]. Currently, Ministry of Finance SR as the central government body is responsible for Information Society through its Information Society Section. Services to citizens and businesses are provided both by the state administration as well as by self-governmental authorities.

The Constitution of Slovakia lays down the basis for the organisation, management and financing of the country's healthcare system. It ensures for citizens and other bodies universal coverage and access to free of charge healthcare services based on mandatory health insurance, built on the principles of solidarity and plurality. In addition, the constitution provides everybody with the right to protect their health.

The healthcare system is financed through:

- social security contributions,
- the health insurance,
- extra payments,
- self payments.

All permanent residents and economically active immigrants contribute through the social health insurance.

The box below summarises facts on the Slovak healthcare system:

Key facts about the Slovak healthcare system:[11]

Life expectancy at birth: 74.3 years (OECD2007)

Healthcare Expenditure as % of GDP: 7.7 % (OECD 2007)

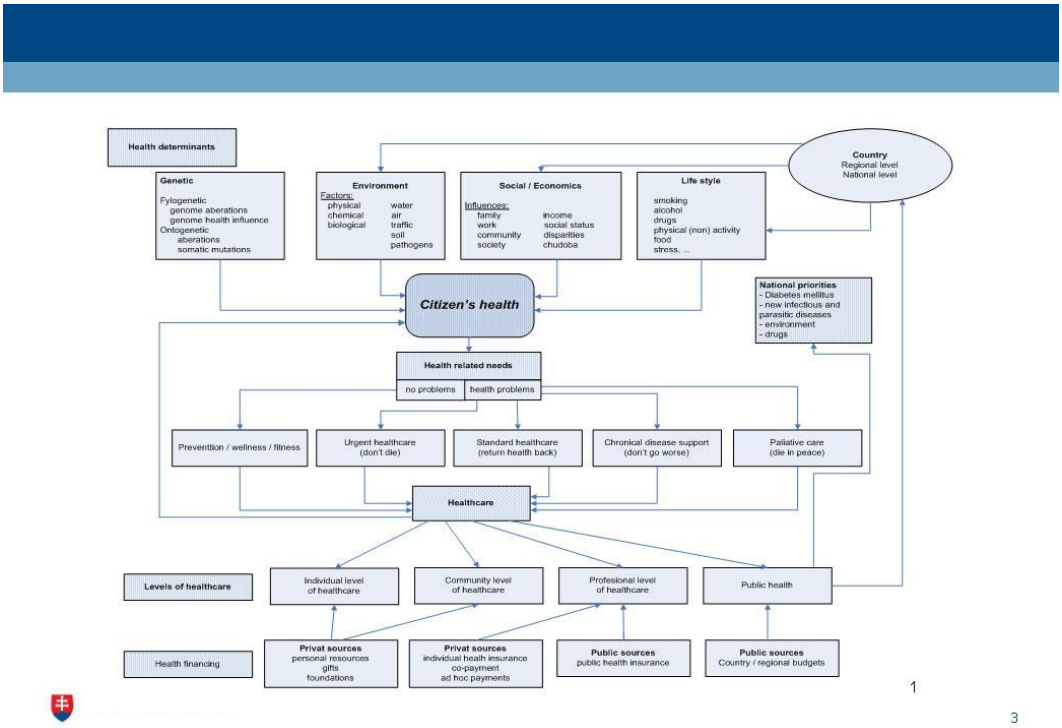
WHO Ranking of Healthcare systems: rank 62

Public sector healthcare expenditure as % of total healthcare expenditure: 66.8 % (OECD 2007)

[9] eUser 2005

[10] Úrad vlády SR [Slovak Government Office]

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



2.2 Healthcare governance

Decision making bodies, responsibilities, sharing of power

The Ministry of Health is the key policy-maker and regulator in the system, collaborating closely with the Ministry of Finance. As the main state executive body responsible for healthcare and health protection, the Ministry of Health proposes the principal directions and priorities of state health policy and prepares and submits the appropriate draft legislation to the Government.

Based on the "Act on Health Care", the Ministry of Health is responsible for the regulation of healthcare providers to ensure that everyone has equitable access to healthcare services. Since January 2002 a major part of the Ministry of Health's powers to issue licences to healthcare providers has been decentralised to local territorial administration – self-governing regions (higher territorial units). The Ministry of Health controls the state owned health insurance company (Všeobecná zdravotná poisťovňa), Ministry of Health issues or withdraws permits to operate to all other health insurance companies.[12] In this context, it is important to differentiate between licenses granted to individual healthcare professionals, issued by the Slovak medical chamber, and licenses to healthcare provider organisations, which are issued by the self governing regions or the ministry, depending on the type of provider. Slovak health insurance companies are under the control of the health surveillance authority – UDZS.[13]

[12] Hlavačka, Wágner et al. 2004, p.14

[13] Healthcare Surveillance Authority

Healthcare service providers

The structure of healthcare service providers in Slovakia:

- Ambulant healthcare:
    - Ambulances of first contact (GP for grown people, GP for children and young people, physician for young people),
    - Company ambulances,
    - Ambulances of direct contact (gynaecologist, dentist, psychiatrist, sexologist, ophthalmologist, physiatrist and expert on rehabilitation)
    - Ambulances of specialised healthcare
- Institutional healthcare on beds
    - Hospitals
        - Local,
        - Regional and hospitals of resorts,
        - Central – faculty hospitals and Central army hospital,
        - Specialised (psychiatric hospitals, specialised centres, ...)
    - Specialised institutions working on the state level
    - Expert health institutions,
    - Institutions of palliative care,
    - Spas.
- Other healthcare
    - Emergency services,
    - Joint examination and caring departments (laboratories, radiology, physiatry and rehabilitation),
    - Centres for dialysis.

The responsibility for public health services was devolved to a network of 37 state health institutes at regional and district level in 1995. These were coordinated by the chief hygienist at the Ministry of Health and central control remained strong. Since 2004 public health tasks have been performed by a network of 36 offices of public health at the level of higher territorial units and municipalities. The 2004 reform strengthens their role in national programmes to prevent non-communicable diseases and seeks to improve cooperation between public health services and primary care.

Four types of first contact doctors deliver primary medical care – general practitioners for adults, general practitioners for children and adolescents, gynaecologist-obstetricians and dentists. From this list of providers, Ministry of Health directly manages central hospitals, some specialised hospitals and specialised institutions working on the state level. All healthcare providers are controlled on the quality of the service by Ministry of Health.

Key facts for Slovakia[14]:

- Number of citizens: 5,412,254
- Number of hospitals: 149
- Number of pharmacies: ca 1,800
- Number of workforce working in the healthcare: 108,340

[14] National Health Information Center Bratislava 2009

- Number of healthcare personal: 79,134
- Number of physicians: 18,121
- Number of nurses: 33,778

The actual numbers of beds in healthcare are (2008):

- Total number of beds in healthcare: 35,452
- Acute beds: 26,344
- Long term care beds: 3,933
- Psychiatric care beds: 4,379
- Other healthcare beds: 796

Pharmaceuticals are exclusively distributed through community and hospital pharmacies and can only be prescribed by physicians and – to a certain extent – dentists. Primary care physicians practise mainly in private single practices, while almost all specialists and other healthcare professionals are salaried employees. These primary care doctors accounted for only 38% of the 16 897 physicians practising in 2002. Despite primary care doctors' gate-keeping role, patients with certain conditions may self-refer to psychiatrists, geneticists and specialists in sexually transmittable diseases. Altogether, the number of outpatient contacts (14 per capita in 2002) ranks substantially higher than in all but one EU Member States. The 2004 reform package provides for a redefinition of healthcare providers' roles and their competencies in contracting and negotiating with health insurance companies and coordinators of care to higher levels of care.

Until January 2002, the Ministry of Health owned and operated almost all inpatient healthcare facilities. Since then, most secondary care hospitals and adjacent polyclinics have been transformed into non-profit public benefit entities or devolved to self-governmental municipalities or higher territorial units at regional level; and some outpatient clinics have been sold to private providers. Tertiary care hospitals continued to be owned by central government. The 2004 reform provides for a gradual privatisation of state-owned hospitals and other healthcare facilities into for-profit joint stock companies supervised by the Office of Health Care Supervision.

Capacities for social care have been developed since the early 1990s. About 1000 acute beds have been transferred to long-term care and 1500 to social care, mainly homes for the elderly. Psychiatric care is delivered partly in specialised hospitals and partly in departments of general hospitals. Also community-based projects such as harm reduction in drug users have been introduced in recent years. Home care agencies have been promoted only since the end of the 1990s, their number increased to 173 in 2003. The 2004 reform allows nurses and midwives to obtain independent provider status.[15]

[15] European Observatory on Health Systems and Policies 2004, p.3, 5-6

Figure 1: Trends in healthcare in Slovakia

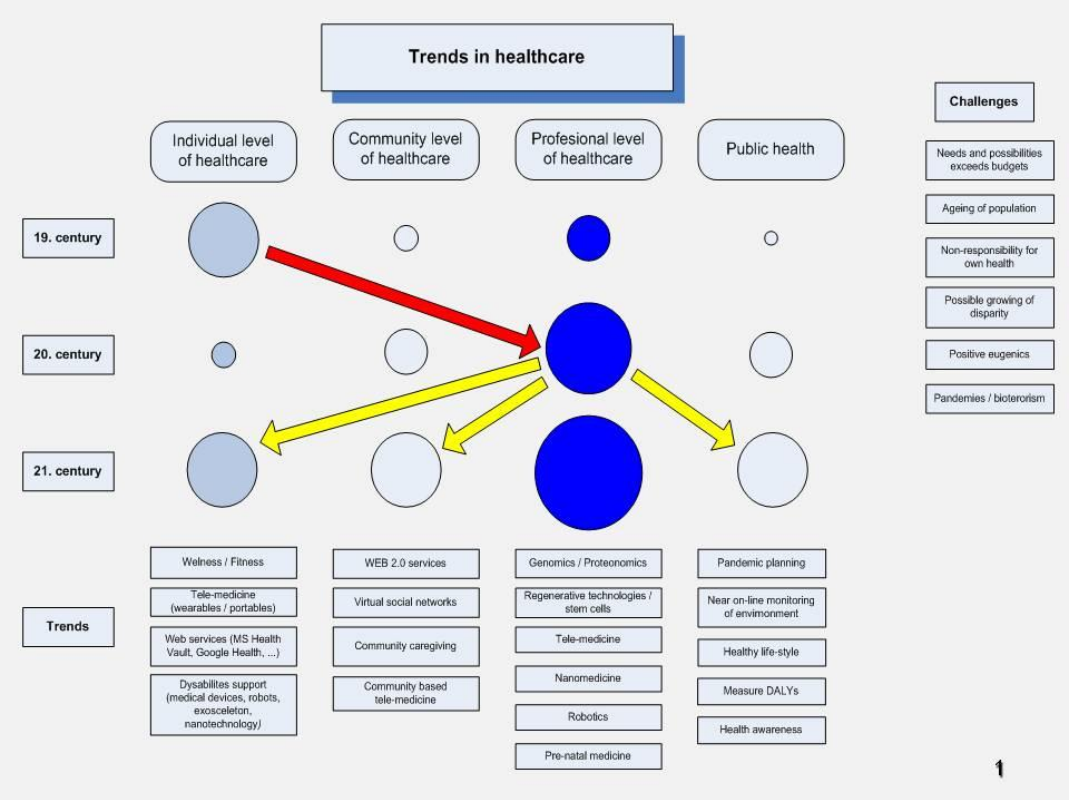


Figure 2: Important features of primary healthcare organisation in Slovakia

Political/administrative unit responsible for primary healthcare	Primary healthcare is organised at regional level. Administrative supervision of primary care is executed by self-government (most providers) or by the Ministry of Health (selected providers, e.g. large hospitals (called faculty hospitals), emergency ambulances, transplantations centres); provision of healthcare is supervised by the Health Care Surveillance Authority. Certain control can be executed directly by the Ministry of Health.
Consumer Choice	Free choice of GP, after the execution of an agreement on the provision of the healthcare – GP change is possible once in 6 months. Medical specialists or inpatient care providers can be freely chosen by the patient. GP choice mainly is related to the place of residence or employment. Certain health insurance companies are allowed to have GP both in place of residence and employment.
Financing	Slovak healthcare is financed through a mandatory health insurance scheme (system of social health insurance), combined with marginal co-payments by citizens (mostly dental care, substantial part of the co-payments set to zero). Small portion of providers is operating solely on the basis of patient's payments outside of the health insurance system.
Public or private providers	Physicians in state (also municipalities or charities) owned hospitals and outpatient clinics are salaried mostly on contractual basis, sometimes the salaries are similar to national pay schemes. Private providers have contracts with health insurance companies or are paid on contractual basis by the patients if they have no contract with the health insurance companies.
Gatekeeping function of the GP	Gatekeeping by GP's has been introduced; patients can bypass GPs to access certain specialist (ob-gyn, psychiatry, dental care). The gatekeeping function is only formal (in praxis, GP issues that-so-called "vymenny listok" without asking the patient any questions) and time-expensive for the patients. Therefore there are plans to allow by-passing of the GP to facilitate the access to the specialists.
Integrating health: initiatives for coordination	The goal to strengthen primary care has not been achieved fully. Most notably cooperation between the primary care and other providers has not been optimised, even though the agencies for nursing home care were recognised recently as a cost-effective substitution for hospital care and their number has increased rapidly.

2.3 Recent reforms and priorities of health system/public health

Currently ongoing reforms in the health and social care systems

Currently there is no reform of healthcare going on in Slovakia. Since 1989, different governments have stressed differing policy priorities, but the main strategies – healthcare financing through social health insurance and decentralisation including privatisation of health service provision – did not change. However, cost-containment became increasingly stringent from 1999, and the role of complementary funding from private sources was increased from 2003.

During the legislative period 1998–2002 reforms addressed issues like defining the appropriate role of the Ministry of Health, privatising or devolving hospitals, reducing

excessive bed capacities, introducing budgets and diagnosis-related payments in hospitals, promoting day and home care services.

Since October 2002 government has placed great emphasis on health policy and developed an encompassing reform agenda to reduce the gap between public revenues and expenditures as well as to increase the system's efficiency, accountability and responsiveness to population needs. In 2004 the first reform package rolled out.[16]

Further, the financing of the healthcare system has been reformed since 2001 in terms of 1) the creation of an environment and incentives for patients to improve their health status; 2) equal treatment to equal needs (with respect to the national list of priorities); 3) guarantee of protection of catastrophic costs (increase financial self responsibility with respect to vulnerable groups); and 4) increase in the allocative efficiency of the health insurance companies by regulated competition in purchasing.

As part of this reform, the insurance rate remained the same – 14% of the assessment base. However, the assessment base is no more bound to absolute numbers as before but it is linked to the average wage. The minimal assessment base equals to the minimal wage; the maximal assessment base is capped by three times the average wage. The assessment base for the economically inactive population is 4% of the average wage. Such a definition of the average base guarantees the increase of available funds in the health insurance every year. The redistribution of collected premium is also retained. The effective redistribution rate increased from 85% to 85.5%.

The comparison of the situation before and after the 2005 healthcare reform can be seen in the following figure. But the 2005 reform mentioned above was not finished.

[16] see above, p.8

Figure 3: Healthcare funding in Slovakia[17]

Parameter	Before reform (until 2004)	After reform (2005–)
Economically active population (2.3 million)	Employees, self-employed, entrepreneurs	Employees, self-employed, entrepreneurs
Minimal assessment base	SKK 3,000	Minimal wage
Maximal assessment base (ceiling)	SKK 32,000	3 × average wage
Solidarity rate (rate of maximal to minimal assessment base)	10.7	7.5
Insurance rate (% of assessment base)	14%	14%
Economically inactive population (3.1 million)	Positive definition	Negative definition
Assessment base for economically inactive population	Set yearly in the state budget	4% of the average wage

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[18]*.*

In terms of infrastructure, 96% of the Slovak GP practices use a computer. An internet connection is available in 44% of GP practices and 15 % of practices have a broadband connection.

The storage of medical patient data related to GPs is only averagely well developed in Slovakia. At least one type of individual data is stored in 92% of GP practices. Most frequently Slovak GPs store medical patient data e.g. on the patient's health status, diagnosis, and medical data etc. A considerable share of Slovakian GP practices store administrative patient data: this pertains to 90% of the practices. The use of a Decision Support System is also common at 88% in Slovakian GP practices.

A computer is available in the consultation room of 90% of the Slovak GP practices. Here it could, for instance, be used to display a patient's file to the practitioner, to explain medical issues to the patient by means of a photo or animation but also to run a decision support system helping in diagnosis or prescribing. The PC is actually used for consultation purposes by 73% of the Slovakian GPs. This share reveals a certain

[17] Kovác 2008

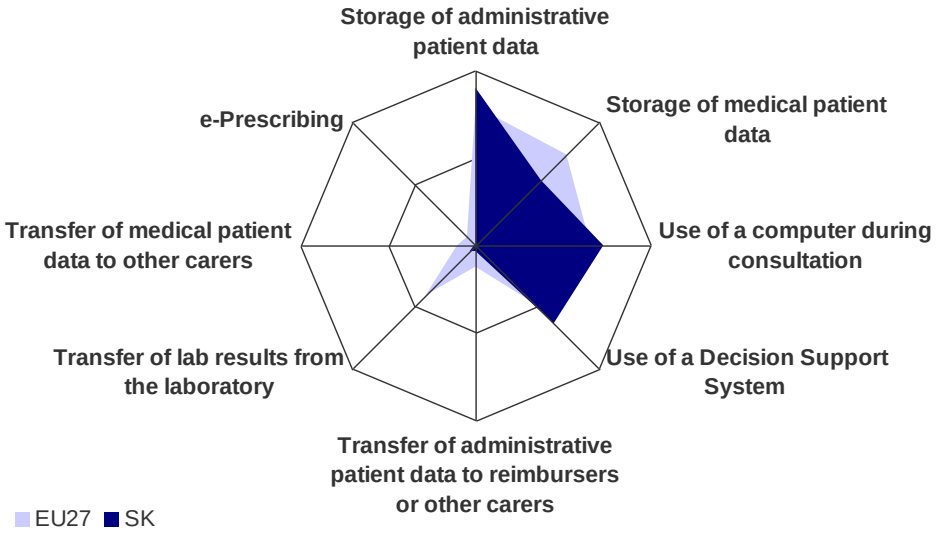
[18] ICT and eHealth use among General Practitioners in Europe 2007

"availability versus use" gap.

Networked EHRs are not yet very common; neither in Slovakia, nor in Europe as whole. Only 5% of Slovakian GPs use network connections for the reception of analytical results from laboratories and only 1% of GPs exchange medical data with other care providers.

2% of Slovakian GP practices exchanging administrative data with other carers. As far as the networked exchange of administrative data with reimburses is concerned, Slovakia is in a similar position: Networks are used for this purpose by 4% of GP practices.

Figure 4[19]: eHealth use by GPs in Slovakia



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

[19] 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.

3 eHealth strategies survey results

The following sections present the results of the eHealth Strategies country study. In a first section, the eHealth policy actions undertaken in Slovakia 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 an outlook on eHealth activities in Slovakia (4).

3.1 eHealth policy action

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

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

3.1.1 Current strategy/roadmap

In Slovakia, there is the citizen-centric eHealth strategy in place. The objective of the strategy is not only to develop the services, but also to support the health of citizens. The document called “Strategic Goals of eHealth – key tool of public governance informatisation in the area of healthcare”[20] specifies the main strategic goals to be obtained through putting the main eHealth applications into work. The document has been published by the Ministry of Health and approved by the Government of the Slovak republic on 16.7. 2008.

“Strategic Goals of eHealth”

The *goa*l of the document is the creation of conditions for the realisation of the Program declaration of the Government of SR, vision of eHealth and vision of the modern healthcare. This will contribute to the expectancies of the citizens in the area of higher quality of offered healthcare, in the area of more effective system of public health and in the area of more accessible healthcare services.

[20] Ministry of Health 2008

Within the document, there are references to the documents from the European level:

- „i2010 – a European Information Society for Growth and Employment“
- „eHealth – making healthcare better for European citizens: An action plan for European Health Area“
- Decisions adopted jointly by the European Parliament and the Council- Decision No 1350/2007/EC of the European parliament and the council of 23 October 2007 establishing a second programme of Community action in the field of health (2008-13)

The document “Strategic goals of eHealth” defines the following four strategic goals:

Strategic eHealth goals:

Creation of a legislative and normative framework for eHealth services

Creation of a secured infrastructure for realisation of the eHealth vision and mission

Informatisation (information systems implementation for the area) of processes and services in the healthcare system, which is financed from the public resources

Support of new processes and forms of healthcare and health services using eHealth services.

Regarding the **first strategic goal** on a legislative and normative framework for eHealth services, the following set of sub-objectives was mentioned:

- To harmonise national eHealth legal and normative processes with eHealth legal and normative processes at EU level.
- To assure legal adaptations and changes, which are necessary for fulfilling both the mission and vision of eHealth.
- To define, approve and implement binding standards for needed technical infrastructure, interoperability, health informatics and statistics in line with norms and standards of EU.
- To work out a process-functional analysis of healthcare in respect of eHealth requirements, to identify processes with greatest benefits after being informatised, to identify and classify risks, avoidable or reducible by using eHealth services.
- Based on previous analysis to work out a high level process model of provision of health services financed from public resources in actual status and final status.
- To work out a high level architectonic design of eHealth based on a high level process model.

Regarding the **second strategic goal** on secured infrastructure, the following set of sub-objectives was mentioned:

- To create a networked infrastructure based on IT to ensure secure and highly accessible communication between all providers of healthcare services.
- To create the infrastructure for identification, authentication and authorisation of the obtainers and providers of the healthcare services using electronic token (for example chip card).
- To create the infrastructure for creation and saving of highly accessible and secure electronic health records of patients and also for the exchange of healthcare information inside the Slovak republic.
- To create the platform infrastructure for all parts of eHealth (including National health

information system and National healthcare portal).

- To create infrastructure for secure back – up and archiving of electronic data, which were created in the system of the provision of healthcare services with the guarantee of their integrity and availability.
- To support the process of migration of the health records already in place in paper and film form into the electronic health records.

Regarding the **third strategic goal** on informatisation of processes and services in the system of healthcare, which is paid for by public sources, the following set of sub objectives was mentioned:

- To build-up National health information system, which will contain the information systems of National Health Information Centre, Health Surveillance Authority, information system working for public health and for other institutions.
- To build-up the presentation level of eHealth in the form of National Health portal and offer the related services.

Regarding the **fourth strategic goal** on support of new processes and forms of healthcare, the following set of sub objectives was mentioned:

- Mobility: to secure the international availability of patient's data, mobility of healthcare and to connect the National eHealth system of SR to international European electronic systems supporting cross border healthcare.
- Self-serving forms of healthcare.
- Telemedicine (diagnostics, monitoring, therapy) including teleprescription-prescription of drugs from a distance.
- On-line monitoring: to limit the possibility of wrong decisions of physicians during diagnosis and during healthcare.
- Personal genomics- individualised healthcare based on genomic scan.

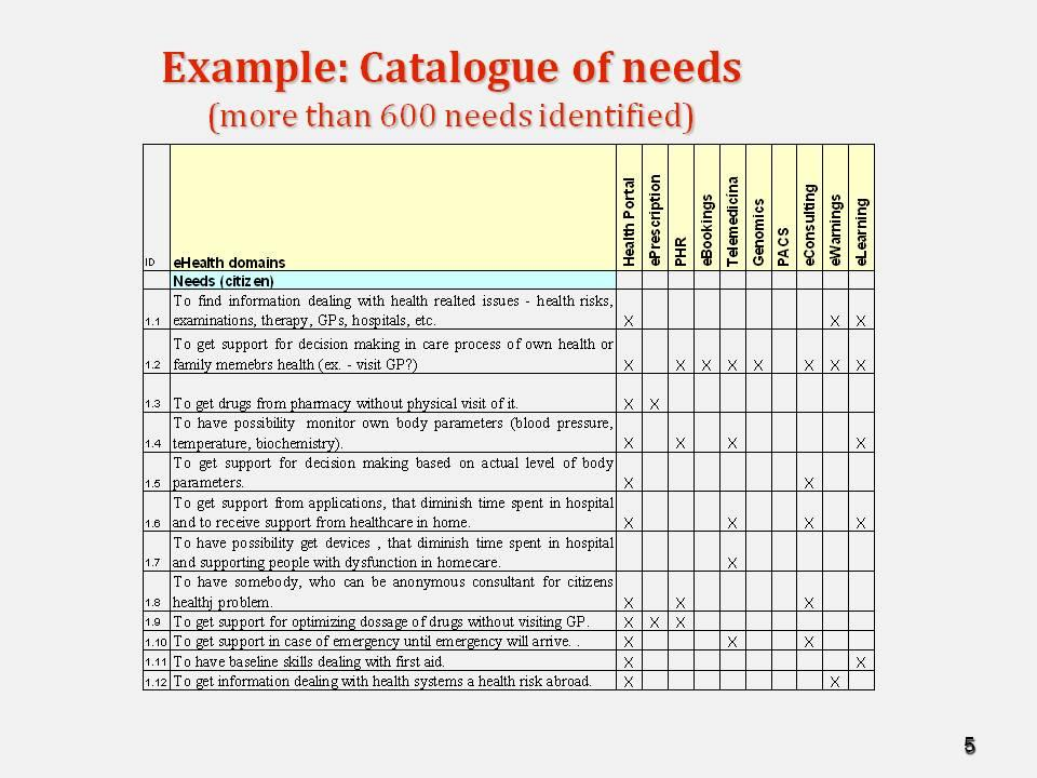
Also other strategic goals are worked out in very detailed way in the following text of the mentioned document. The detailed description was later used for the creation of next important documents related to eHealth services in Slovakia.

In the further chapters of the document, base for the realisation of the mentioned strategic goals is described in detailed way, Also the proposal of the organisational provision of the implementation of the strategic goals is described in the detailed way and at the end you can find the detailed proposition of the financial provision of the implementation of strategic goals.

Based on the mentioned document all other related activities were coordinated by Ministry of health- the most important was the National eHealth programme.

In the preparation phase, the following documents were created:

- Catalogue of eHealth needs and services,
- Proposal of the Concept of progress of ISs in the area of public governance,
- Feasibility study on eHealth projects.
- Feasibility study on architectural framework and implementation of eHealth programme for all 3 eHealth waves.



Example: Catalogue of needs

(more than 600 needs identified)

ID	eHealth domains	Health Portal	ePrescription	PHR	eBookings	Telemedicina	Genomics	PACS	eConsulting	eWarnings	eLearning
	Needs (citizen)										
1.1	To find information dealing with health realted issues - health risks, examinations, therapy, GPs, hospitals, etc.	X								X	X
1.2	To get support for decision making in care process of own health or family memebrs health (ex. - visit GP?)	X		X	X	X	X		X	X	X
1.3	To get drugs from pharmacy without physical visit of it.	X	X								
1.4	To have possibility monitor own body parameters (blood pressure, temperature, biochemistry).	X		X		X					X
1.5	To get support for decision making based on actual level of body parameters.	X							X		
1.6	To get support from applications, that diminish time spent in hospital and to receive support from healthcare in home.	X				X			X		X
1.7	To have possibility get devices , that diminish time spent in hospital and supporting people with dysfunction in homecare.					X					
1.8	To have somebody, who can be anonymous consultant for citizens healthj problem.	X		X					X		
1.9	To get support for optimizing dossage of drugs without visiting GP.	X	X	X							
1.10	To get support in case of emergency until emergency will arrive. .	X				X			X		
1.11	To have baseline skills dealing with first aid.	X									X
1.12	To get information dealing with health systems a health risk abroad.	X								X	

5

In the first phase, the following document was created:

- Feasibility study on electronic services of healthcare- eHealth services for citizens,

In general, several national documents relate to eHealth, the most important being:

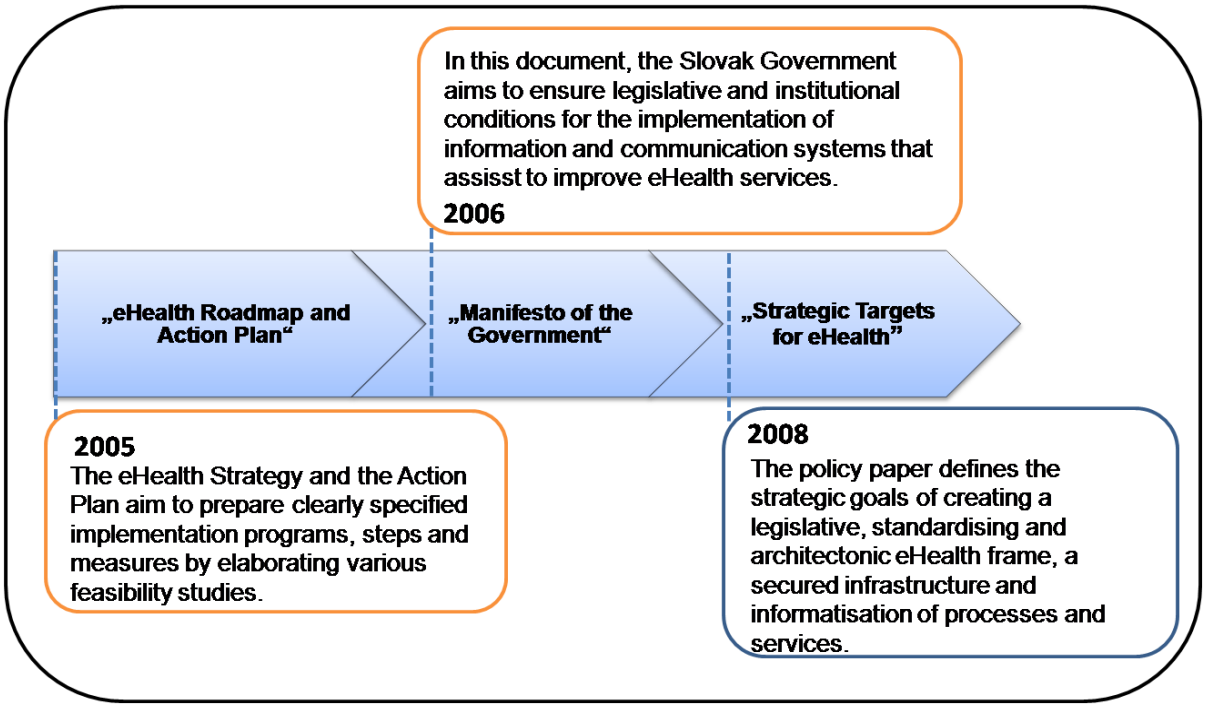
- "Manifesto of the Government of the Slovak Republic"[21] from August 2006. In this document the Government states that it "will ensure legislative and institutional conditions for implementation of information and communication systems that will essentially assist in improvement of quality, cost, efficiency and time availability of services"[22]. In this area the Government will support the project of healthcare in informatisation and gradually implement the objectives of the national eHealth strategy.
- "Strategy of Governance Informatisation" (Resolution of Government SR , No.131, 27/02/2008)
- "Report on the Status of Informatisation in the Branch of Health Services" (Resolution of Government SR, 26/03/2008), in which there was the task for Minister of Health of SR to put forth the material "Strategic goals of eHealth ..." to the government until 30.6.2008.
- "National Concept of Governance Informatisation" (Resolution of Government SR, No.331, 21/05/2008)
- "Strategic Goals of eHealth – key tool of public governance informatisation in the area of healthcare"[23] (Resolution of Government SR, 16/7/2008)
- "National Strategy for Information Security" (Resolution of Government SR, 27/08/2008)

[21] Government of the Slovak Republic 2006

[22] see above, p.35/36

[23] Ministry of Health 2008

Figure 5: Slovakian policy documents related to eHealth



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3.2 Administrative and organisational structure

The administrative and organisational structure supporting eHealth activities in Slovakia is based on the National eHealth programme. The main **managing body** for the National eHealth programme in Slovakia is the sponsor of the eHealth program in Slovakia – Minister of Health of the Slovak Republic. The main **executive body** of the National eHealth program in Slovakia is Director of the unit of Ministry of Health in Slovakia, who is responsible for the information system inside the healthcare sector in Slovakia. The main **monitoring body** on the same level as the main executive body is the eHealth working group, established as the advisory board for Minister oh Health of Slovak republic.

Members of the eHealth working group are institutions representing all stakeholders related to eHealth activities.

List of members of the eHealth working group:

- Ministry of Health represented by the Director of Unit of informatics, who is also the head of the eHealth working group.
- Healthcare Surveillance Authority.
- Public Health Authority.
- State Institute for Drug Control.
- Slovak Medical Chamber.
- Slovak chamber of pharmacists.
- Association of Faculty Hospitals.
- General Healthcare Insurance company,

- Association of private healthcare insurance companies.
- Slovak Hygiene University.
- National Health Information Centre and others.

Slovakia has a competence centre called “National Health Information Centre”[24] (NHIC), that is responsible for all production activities inside the National eHealth Programme in Slovakia, mainly for eHealth implementation activities regarding the National eHealth program. NHIC is defined as a state contributory organisation, which was established by the Ministry of Health in February 2006.

National Health Information Centre

The National Health Information Centre covers the following tasks:

- Realisation of the National eHealth program,
- The role of National eHealth operator,
- National centre for healthcare informatics standards,
- Management of the health information,
- Support of the education in the healthcare area

The National Health Information Centre collaborates – within its activity field – also with other institutions, such as the Statistical Office, , the Institute of the Slovak Academy for Sciences, as well as experts within the field of health (e.g. hospitals, health insurance companies, medical faculties and professional health companies).

National eHealth program has its preparation phase and next 3 waves (phases), which are planed from 2008 to 2013. First wave represents the core of eHealth services, second wave is dedicated to the integration of national eHealth services with the IS of healthcare providers and the third wave is dedicated to the integration with the eGovernment services.

National eHealth program was divided into the components and domain areas. There are 45 components of the program and 16 domains. The domains are as follows:

- Integration,
- Program and project management,
- Medial activities – PR,
- Infrastructure,
- Security,
- Norms and standards,
- Legislative framework,
- National healthcare portal,
- Electronic healthcare book for citizens,
- eAllocation,
- ePrescription and eMedication,
- telemedicine,
- unitary data reference base (national terminology, administrative registers, register of healthcare efforts, list of pharmaceuticals and other),

[24] National Health Information Centre

- management of the healthcare information,
- epSOS,
- Genomics.

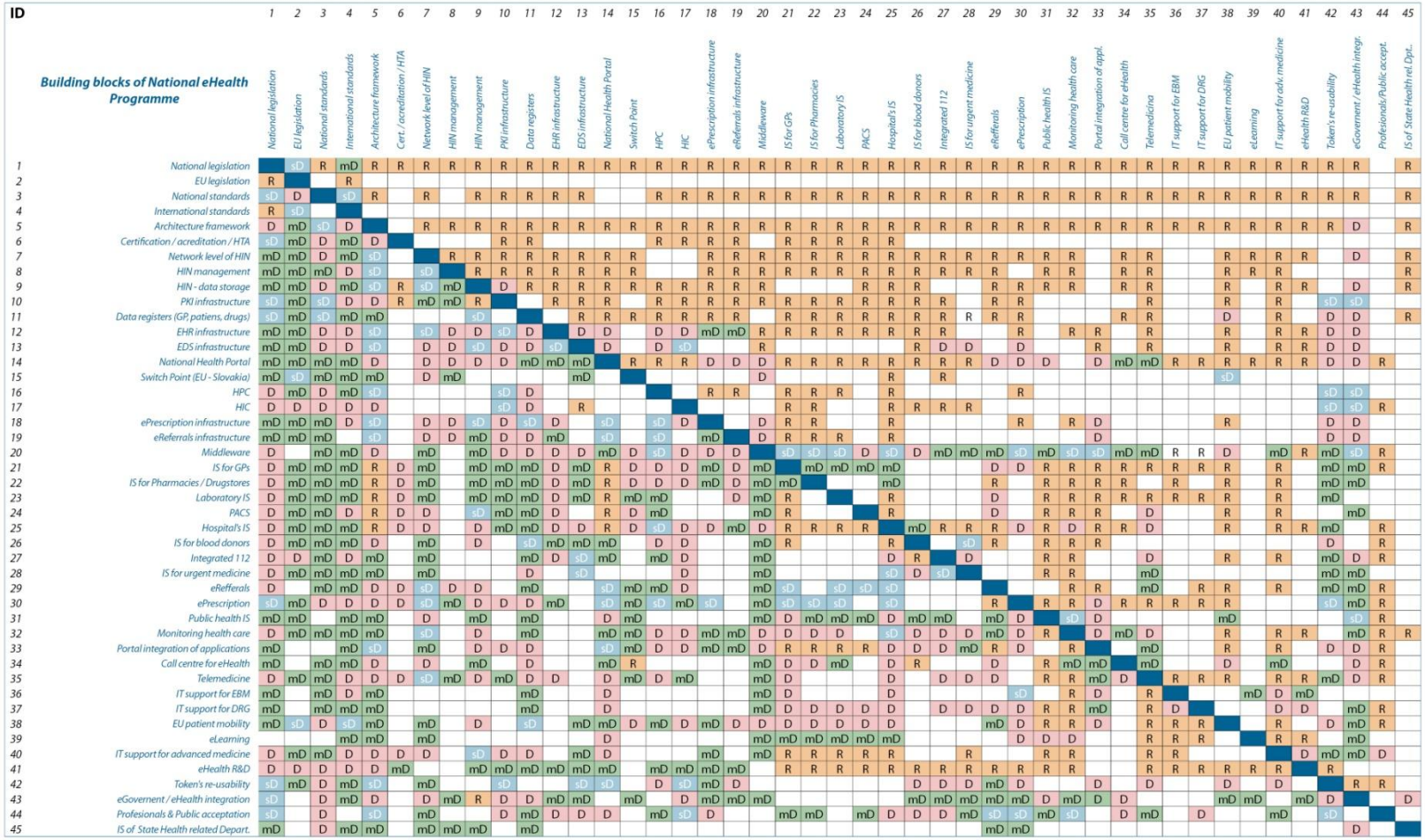
Related to mentioned domains, in the preparation phase the preparation of National Health Information Centre for the role of national eHealth operator was finished and also some feasibility studies were completed as mentioned above. The preparation phase is now over and the Phase 1 (wave 1) has started with the eSO1 project. The Phase 2 (Wave 2) is in the preparation phase.

Slovak eHealth Programme

sD - strongly depends on
D - depends on
mD - small dependance
R - receives requirements from

Example 1: National legislation strongly depends on EU legislation

Example 2: National legislation receives requirements form PKI infrastructure (example: how to long-time archive revocations of certificates)

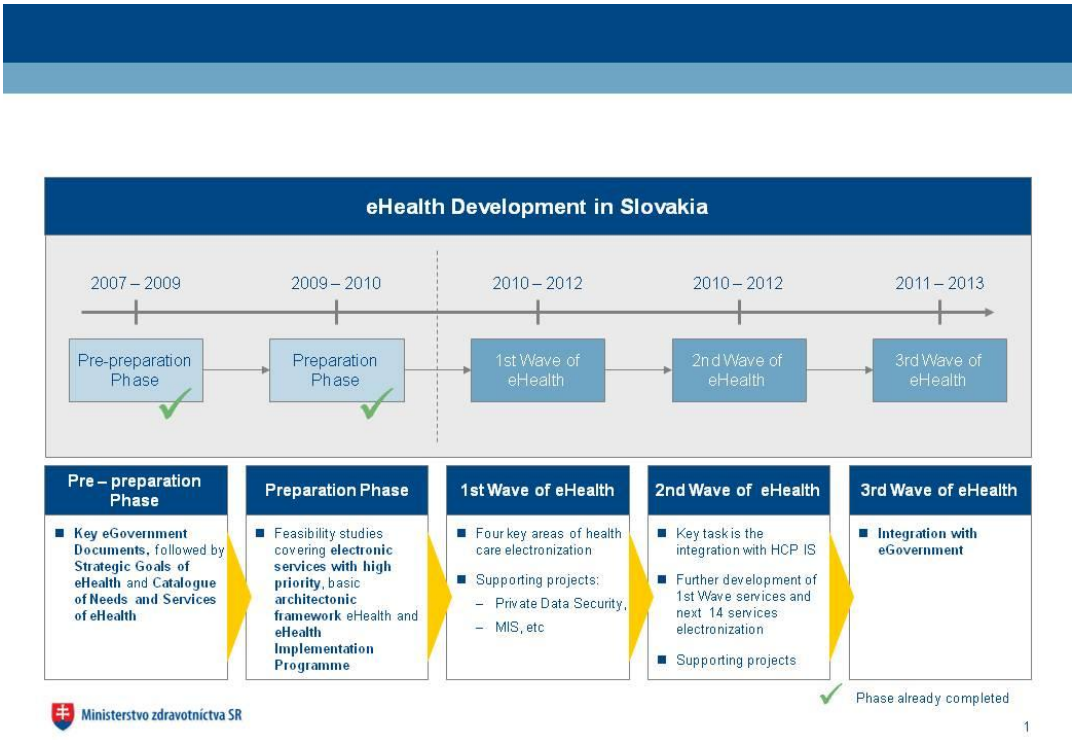


3.3 Deployment of eHealth applications

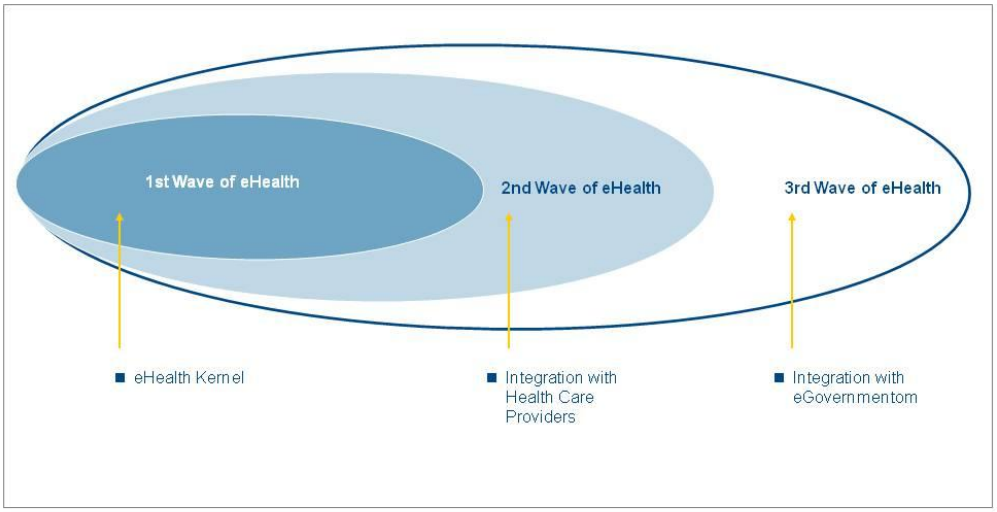
eHealth deal with US company for further implementation

In order to implement the first phase of the Slovakian electronic healthcare system, the Ministry of Health has signed a €40m deal with the consortium of companies[25] in April 2010. "The two year deal will provide the following projects:

- National healthcare portal,
- ePrescription,
- Electronic healthcare book for citizens
- eAllocation.
- Legislative projects,
- Projects dedicated to security.



[25] Ness Technologies Inc.



Ministerstvo zdravotníctva SR

2

Time Schedule of the eHealth Implementation

ID	Processes and activities	2008	2009	2010	2011	2012	2013
1	Starting up Programme						
2	Initiating Programme						
2.1	Establishing the infrastructure and programe organisational structure						
2.2	Developing the architecture and models						
2.3	Creating feasibility studies for each phase						
3	First phase						
3.1	Creating a National project for 1.priority area						
3.2	Procuring for 1. priority area						
3.3	Realising projects of 1. priority area						
3.4	Realising early benefits of the first phase						
4	Second phase						
4.1	Creating a National project for 2. priority area						
4.2	Procuring for 2. priority area						
4.3	Realising projects of 2. priority area						
4.4	Realising early benefits of the second phase						
5	Third phase						
5.1	Realising early benefits of the third phase						

Ministerstvo zdravotníctva SR

4

In sum, Slovakia is aiming to create the basic pillars of healthcare computerisation through this eHealth deal.

3.3.1 Patient summary (EHR)

In this study, the epSOS project's definition[26] 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.

Emergency data set developed in 2008

At this time, Slovakia does not have a fully developed patient summary, but it is taking part in the European epSOS project, where the specification for patient summary has been done. Patient summary defined by epSOS will be the base data set for collecting patient data into the Electronic healthcare book for citizens. This dataset will be enlarged in the future to obtain the full EHR. Within epSOS the clinical elements of the patient summary include information on allergies, medical alerts, current medications, medical devices and a list of current medical problems with a relapsing character, such as asthma for example.

A national registry of elementary health data has been created (Act No. 576/2004) and the extension of it is in a planning stage. For now, the registry contains the following information:

National registry of elementary health data:

- Name and surname, surname at birth
- Personal number, identification of the health insurance provider
- Code of residence, address
- Data related to the informed consent
- Patient History (including risk factors of the person and its family)
- Illness related data
- Results of preventive check-ups

[26] European Patients Smart Open Services

- Course of treatment (including data related to the health and diagnosed condition, summary of the health condition, epidemiologically important data)

- ICD codes

- Data on the provided healthcare

(- Date of death, cause of death)

Due to the planned amount of collected data, there is no fully developed patient summary, but more or less a summary on health data, which is planned to be collected from every citizen in Slovakia.

Also in a planning stage is the development of condition-specific summaries regarding cardiac summary, diabetes and other chronic diseases, such as lung disease or heart disorder. A current list of these health registries is determined in Annex 2 of Act No. 576/2004 on healthcare. Examples for condition-specific registries are cardiovascular diseases, arthroplasty or brain vascular and oncologic diseases.

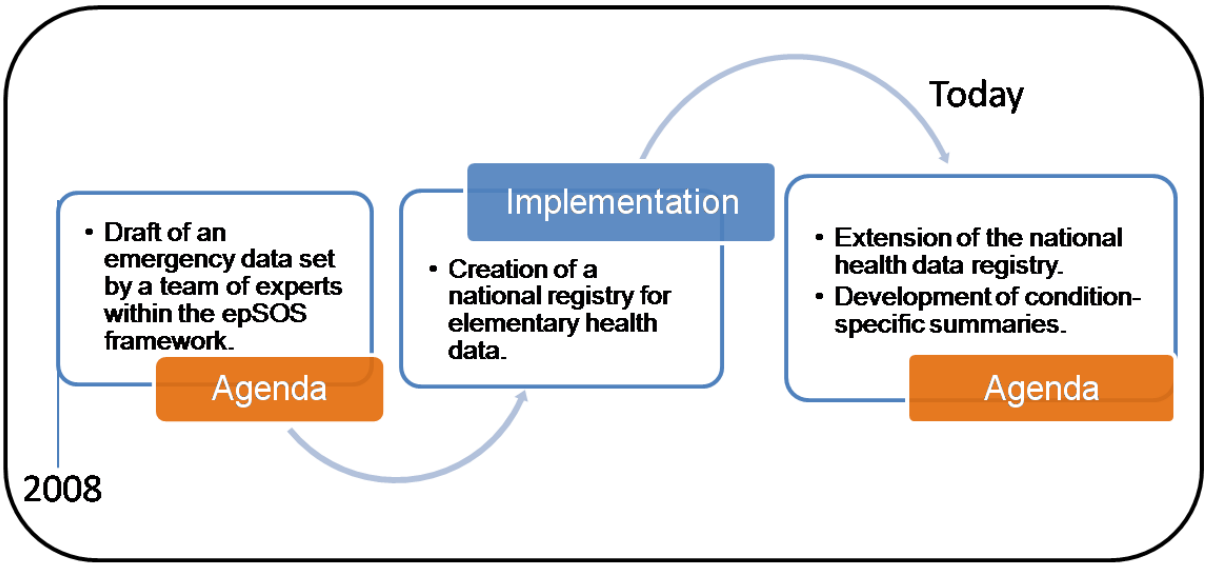
Challenges are of technical and organisational nature

The main challenge of the electronic health record development is of technical and organisational nature: The cost for building up the necessary IT infrastructure (centralised) and the equipment, which is needed by healthcare providers, are implementation barriers. Further concerns are related to the legislative situation in Slovakia at that time. The centralisation of a huge amount of sensitive data causes a great deal of discussion, whether this collection of individual data is necessary and where the limits for collection will be set. People, who oppose the creation of such data sets, are concerned with the danger of data theft and accidental disclosure of private information.

Some portion of the ICT professionals doubt that such project will be accepted by the population. Another problem is that there has been no broader discussion about the security of the solution. The presented concepts focused on the central data storage, while the individual computers used to access/create content of the central storage are omitted. Potentially number of such computers could be in the 10.000's range. Recently NBU the National security authority responsible for protecting of classified information has been hacked by teenage hackers after they discovered trivial passwords. The present setting of the data collection scope includes any and all health related data which is a major concern that this is far more than necessary data collection. This may be even in the violation of one's constitutional right to privacy. Further aggravating circumstance is the fact that there is currently no opt-in model for the creation of an electronic healthcare record.

Another issue in debate is the possible "digital exclusion" of certain groups, e.g. disabled, low-educated, elder people and marginal social groups.

Figure 6: Patient summary in Slovakia



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3.3.2 ePrescription

In the framework of this study and following work in epSOS[27], 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.

Currently no ePrescription services in Slovakia

During the first wave of eHealth projects (as mentioned above), the introduction of ePrescription, with the full set of functionality, is planned.

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.

Today, the Slovak version of ICD 10 is routinely used in Slovakia. The use of CEN EN 13 606 (electronic health record communication), HL7 (health level 7) and DICOM (digital imaging and communications in medicine) are recommended.

[27] European Patients Smart Open Services

As mentioned above, in Slovakia NHIC is also responsible for the standards inside the eHealth area. The project connected to that responsibility is called Unified Reference Data Base and covers all activities regarded to eHealth standards.

Slovakia is from the beginning of the year 2010 a member of the IHTSDO organisation and prepares for the translation of the first SNOMED CT data set, defined as the part of the epSOS reference terminology (value set).

In the future, NHIC plans to start with the translation of SNOMED CT translating comprehensive data sets connected with the concrete use-cases, in the first step in the area of oncology.

In Slovakia, the tasks of the above mentioned National Health Information Centre (see 3.2) also foresee responsibility in the field of standards: It is defined that the NHIC is assigned to the following tasks related to standards:

Tasks related to standards of the NHIC:

Definition of standards, integration tools (code lists, classifications, protocols and interfaces) and rules of communication between health information systems

Update and administrate the catalogue of standards, as well as standardisation and methodical activity in the area of standards

Implementation and application of international standards and norms

Executing project coherence related to information and communication technology in health service

Provide integration and cross-connection of information systems, such as cross-border communication of healthcare providers

Routine use of ICD 10

At this stage, ICD 10 is routinely used in Slovakia and the use of CEN EN 13 606 (electronic health record communication), HL7 (health level 7) and DICOM (digital imaging and communications in medicine) are recommended.

For the exchange of information in general, standard document formats are listed in a Ministry decree (MF/013261/2008-132). Mandatory file-types are:

- Text files and files containing tables: RTF, HTML, PDF, ODT, TXT
- Graphic files: GIF, PNG, JPG, TIFF, SWF, SVG
- Audio and video files, including streaming: MPEG, OGG, WMA DRM 10 – only in the case when for the provision licensed content is required)
- Data compression: ZIP, TAR, GZIP

Challenging aspects of standard deployment are the analysis and early adoption of appropriate formats. Here as well, a legislative framework is needed to develop further in this field.

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"[28]*. 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*[29]*.*

Ad hoc consultations between health professionals

Broader introduction of Telemedicine services in Slovakia is planned for during the second wave of the National eHealth programme.

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 Slovakia and for which purpose.

3.4.1 Unique identification of patients

For citizen's identification, the National Citizen ID has been used as a routine procedure in Slovakia (since 1948). The ID is called "Občiansky preukaz" and was introduced by the Act No. 198/1948[30]. The Citizen ID contains the following data:

Slovak Citizen ID data

- Name, surname (surname at birth)
- Sex, citizenship, date and place of birth
- Personal number ("rodné číslo" (birth number) – unique ID assigned to the person upon birth)
- Place of residence
- Date of issue, date of expiry, place where the ID has been issued
- Special remarks (e.g. blood group – can partially be selected by the citizen)

Essential for the identification of a citizen or patient is the personal number, which was given at birth. For health purposes, an additional (paper) health insurance card and a numerical code (defined by the health insurance companies) are applicable. These procedures are monitored by the Health Care Surveillance Authority (HCSA), which was enacted in

[28] Europe's Information Society

[29] European Commission 2008

[30] On Citizen ID (in force 1949-1953), later replaced by Act No. 61/1958 Coll., Act No. 75/1957 Coll., Act No. 162/1993 Coll. and finally by the Act No. 224/2006 Coll. on Citizen ID.

2004[31].

Every health insurance company maintains a register of persons to which it provides public health insurance and issues to a health insurance ID card to them. The insurance ID card is a plastic or paper card (passive card) with personal data and a unique ID printed on it. The two companies, which provide public health insurance use a different format for the unique number, but follow the same pattern: For example “Dôvera” and “Apollo”[32] use NNNNLLNNNN. In this case, N is a number and L stands for a letter. This code or number is assigned by the company itself. For identification purposes outside of health insurance; the National Citizen ID is used.

Inside the National eHealth program it is planned to use EHIC (and later eEHIC) cards for patient identification. This will be probably partly influenced by the further epSOS specifications for this area.

3.4.2 Unique identification of healthcare professionals

Health Care Surveillance Authority assigns code

The above mentioned Health Care Surveillance Authority also assigns a unique code to every healthcare provider (e.g. physician, pharmacist, nurses, midwifes, assistant, laboratory worked). These numbers or codes are available online in form of a list[33].

This ID is used for offline identification – for example in medical records or prescriptions. Furthermore, basic precondition for licensing physicians and other categories of medical workers is their registration pursuant to chapter III of the Providers Act[34]. The registration is legally defined as the inclusion of a medical worker to the register and the issue of confirmation of registration. A Registration fee of max 13 € is charged.[35] The respective professional chamber maintains the register of the medical workers it affiliates. The register[36] formally is a list of medical workers, maintained by the medical profession.

The respective chamber progressively updates the register according to data supplied by the registered healthcare providers. Medical workers are charged maximally 4€ per year for maintenance of the register by the chamber. If details of systematic education are missing e.g. in the case of a medical workers, which is an employee, the chamber sends a notice demanding elimination of ascertained deficiencies. The notice is also sent to the HCSA Registration ID assigned by the respective professional association and logger in their register servers in particular for the identification of the healthcare worker e.g. in life-long education. The Act No. 576/2004 Coll. on Healthcare as amended introduces the national register of healthcare workers which provides the legal framework to set up another register at national level.

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[31] Act No. 481/2004 Coll.

[32] These two companies merged as of January 1, 2010, At the present stage, there are only 3 health insurance companies in Slovakia.

[33] A complete list of codes assigned to physicians is available online in tabular format (Slovakian): http://www.udzs.sk/buxus/docs//web/METODIC_USMER__c_1_3_2007.pdf

[34] Act. No. 578/2004 Coll. on healthcare providers etc. (21.10.2004).

[35] see § 63 (4) of the act 578/2004 Coll.

[36] The register for medical workers contains: registration date, registration number, details comprising part of the notice, other details announced in the notice, documents supplied with the registration notice.

Basically, the register contains the following data of healthcare workers:

Registered data of healthcare providers:

- Personal number
- Name, surname, academic title
- Data of birth, (date of death)
- Nationality
- Address
- Years of professional praxis
- Category of healthcare worker
- Code of the physician or selected medical worker assigned by HCSA
- Registration numbers assigned by respective professional associations
- Start and end of registration
- Data related to the contract of the respective healthcare worker
- Qualification, Profession
- Location where the person provides healthcare

The national health services related identifiers are already in daily use. In general, Slovakia has a national citizen ID; there are centralised databases of healthcare providers, healthcare professionals and people with mandatory health insurance (every Slovak national).

Plans to reform ID system

All these people have been assigned unique identification. There are plans to reform personal numbers format, as in the present form it is not strictly anonymous as one can recognise sex and date of the birth directly from the respective person's personal number used as National ID.

Inside the National eHealth programme it is planned to use HPRO cards for the identification of healthcare professionals. This will be probably partly influenced by the further epSOS specifications for this area.

3.4.3 The role of eCards

As mentioned above, the National eHealth programme plans in its second wave the introduction of eCards. The use of eEHIC for identification of the patient and the use of HPRO card for identification of the healthcare professional is planned.

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.

Legislation concerning EHR has been enacted

In Slovakia, a legislation concerning electronic health records has been enacted. The principal legislative act related to this matter is Act No. 576/2004 on healthcare, healthcare related services and on the amendment and supplementing of certain Acts as amended (hereinafter "Act on Health Care 2004"). On February 15th a major amendment of the Act No. 576/2004 Coll. has entered the initial stage of the legislation process. The main focus of the proposed amendment is to create a legal framework for eHealth. However, the proposal will not reach the parliament before the general election. A provision which shall force GPs a duty to digitalise medical records of his/her patients between 2013 and 2017 is a key obstacle to progress of the amendment.

Act on Health Care (2004)

The Act on Health Care itself does not contain explicit provisions on the way of medical record storage in the present wording. Article 20 enables the maintenance of health records in written or electronic form. If opted for an electronic form, qualified electronic signatures need to be used and a backup system needs to be in place[37].

It is defined that the content of the medical record is the following:

Medical Record Content in Slovakia:

- Patient's personal data in a scope necessary for the identification and anamnesis
- Data related to the provision of information and informed consent
- Data on the patient's diseases, course and results of examinations, treatment and other significant circumstances connected with the patient's health condition and processes of healthcare provision
- Data on the scope of provided healthcare,
- Data on healthcare-related services
- Data on temporary work incapability due to illness or injury and circumstances significant for appraisal of the capability for performing work
- Epidemiological significant circumstances,
- Identification data of the pertinent health insurance company,
- Identification data of the provider.

The patient's general practitioner maintains the medical record as a whole, while other healthcare professionals only maintain records regarding the treatment provided by them[38]. The records need to be stored for 20 years, starting from the moment of death of the patient[39].

The Act on Health Care also states that maintaining medical records is an integral part of the healthcare provision and therefore, medical records – in material or electronic from – do not need any consent from the patient to be created.

This is in accordance with article 8 §9 (1) of the Slovak Data Protection Law[40] which

[37] For the exact requirements to the back-up system, see §20 (3) Act on Healthcare

[38] §18 (3) Act on Healthcare

[39] §22 (2) Act on Healthcare

[40] Act No. 428/2002 Coll. On Personal Data Protection, available in English at: http://www.dataprotection.gov.sk/buxus/docs/act_428_2002_01_09.pdf

provides that the written consent of the data subject is required for the processing of data concerning health, unless (amongst other exceptions) a special Act provides otherwise.

The Data Protection Law does entitle the patient or his representative and certain close relatives to examine his medical records. The entitled person has the right to make excerpts or copies of the medical record. Healthcare providers are furthermore also obliged to provide other physicians or specialists who take the initiative to a medical examination with an excerpt[41].

3.5.1 Patient rights

The rights and duties of patients and healthcare providers are regulated in the Act on Health Care[42]. This act contains a comprehensive regulation of the patient – healthcare provider relationship.

The Act on Health Care regulated first of all the rights of access to the medical record. Those persons who have the right to access the patient's medical file are enumerated in §11 and §24. The healthcare provider is allowed to refuse access to a medical file if the patient is provided with the healthcare in the specialised field of psychiatry or clinical psychiatry and the access to the medical records would negatively affect his treatment. Each person who has the right to access the medical file also has the right to make extracts or copies to the extent that he has access. It can even grant a power of attorney to someone for access – this Power of Attorney should be notarised.

Electronic and offline medical records are subject to the same legislation

A husband or wife, a child or a parent (or their legal representative) has the right to fully access the medical file of the patient after his death. In case there is no such person, the right to access the medical file is exercised by an adult person living with the patient at the time of his death or a relative (or their legal representative). The person who is entitled to access the medical records after the patient's death also has the right to make extracts or copies from the medical file.

In special cases the publication of specific data can be prohibited by the patient: For example, if a woman signs a written application for nondisclosure of her identity in connection to child birth, this medical record will be considered as "special". These special medical records do not contain any personal data necessary for identification. Personal data is then kept separately from special medical records together with the written application for anonymous childbirth. Access to the special medical records is restricted and special medical records are generally excluded from enabling access to medical records and providing data from medical records[43].

Correction of a report in the medical file is accomplished by a new entry consisting of the correction date, the corrected information and the identification of the attending medical professional who corrected the entry. Only the author of the original entry is entitled to

[41] §24 Act on Healthcare

[42] Act No. 576/2004 Coll. On healthcare, health-related services and on the amendment and supplementing of certain laws

[43] Furthermore, the provider is obliged to deliver without undue delay the special medical records within six weeks after the childbirth to the Ministry of Health if the woman by the said term did not withdraw her application for nondisclosure of her identity in writing, see §19 (4).

correct his report. It is specifically required that the original entry must remain legible after the correction.[44]

Basically, electronic and general medical records are subject to the same rights and duties, regardless which form it has.

After being inspired by epSOS, the National eHealth project will accept all rules regarding the patient consent specified by epSOS. To save the lives of patients after heavy accidents the Emergency data set will be available for every patient as soon as possible.

3.6 Financing and reimbursement issues

Central government as main source of funding

In Slovakia, the main source of funding for government projects is the central government with State Budget. Funds coming from the EU are implemented through State Budget item called OPIS. Co-financing comes from the State Budget itself in the amount of 10% of whole project amount. For the years 2009-2013 three implementation phases were planned and the total amount of financial sources was set up to 252,3 million euro split between three phases as follows:

Preparation phase- 10 mil. euro

The main portfolio of the 1st Wave (already in place)- 40 mil. euro.

The main portfolio of the 2nd Wave (currently in public procurement phase) – 49 mil. euro.

The main portfolio of the 3rd Phase (currently under preparation) – 45 mil. euro.

After full eHealth implementation it is expected to save up to 5% of costs dedicated to healthcare in Slovakia. These savings will be used to improve quality of healthcare provided to patients as well as to finance modernization of healthcare providers' equipment and.

4 Outlook

The real start of eHealth activities was the day 16.7.2008, when the Government of the Slovak Republic approved the document "Strategic goals of eHealth ...". This document gave mandate for establishment and realisation of National eHealth Programme for the years 2009-2013. In Slovakia, eHealth is firmly anchored on the policy level. Closely aligned with the eHealth Action Plan, the government started in 2005 to set out strategic objectives for eHealth. In order to understand correctly the stakeholder needs in the process of citizens healthcare and not to replace them with the technical needs of certain eHealth application, RUP methodology was used to run detailed needs and requirements analysis. Based on such analysis, a Catalogue of eHealth Needs and Requirements consisting of more than 1,640 items was prepared. A dedicated agency, the National Centre for Health Information, prepared for the position of National eHealth operator, accompanies eHealth work on a daily basis.

[44] §20 (4) Act on Healthcare

On the level of eHealth implementation, Slovakia has in place a system of identifiers for both patients and healthcare professionals. A national registry of elementary health data is also being established. At the moment, it is not yet filled with content. Only the legal acts establishing the registry are in place. However, eHealth progress in Slovakia still struggles with open legal issues regarding the central storage and collection of personal health data and appropriate security mechanisms. During the preparation phase as well as during the first phase of the eHealth implementation, many issues are discussed and solved. One of the key discussions is regarding the security of collection and storing personal data. The next issue in debate is the possible "digital exclusion" of certain groups, e.g. disabled, low-educated, elder people and marginal social groups.

The cost for building up the necessary IT infrastructure (centralised) and the equipment, which is needed by healthcare providers, are implementation barriers. Even if the costs for IT infrastructure are relatively high, due to the fact that it should be reliable, secure and enabling central data collection and storage with enough backlog for increased approach from the user's side and increased data volume. Based on currently valid regulations, each doctor should have his / her own PC with broadband Internet connection. Overall "Internetization" is the next ongoing project financed from OPIS. Anyhow, even if the Internet connection is available in many parts of Slovakia, take-up among GPs is low.

Many issues lead to the implementation plan, where prototypes 1 and 2 will be prepared for each key domain and will be given for public discussion. After collecting and implementing valuable comments, alpha and beta versions will be prepared and given for public discussion again, in order to "catch" remaining potential failures or problems. Only then will the product be released. Such an approach gives the potential to solve all open issues and to give professionals and citizens the possibility to comment on development. On the other hand, the described approach put full transparency on all eHealth related activities.

Slovakia has the eHealth strategy and the managing entity responsible for the implementation of the eHealth projects in place. Slovakia is now in the beginning of the eHealth implementation process.

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
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
NHIC	National Health Information Centre
OECD	Organisation for Economic Co-operation and Development
PHS	Personal Health System
R&D	Research and Development
SNOMED	Systematized Nomenclature of Medicine-Clinical Terms
UDZS	Health Surveillance Authority
WHO	World Health Organization

6 Annex

6.1.1 Annex 1: Compound indicators of eHealth use by GPs

Compound indicator name	Component indicators	Computation
Overall eHealth use	1. Electronic storage of individual medical patient data 2. Electronic storage of individual administrative patient data 3. Use of a computer during consultation with the patient 4. Use of a Decision Support System (DSS) 5. Transfer of lab results from the laboratory 6. Transfer of administrative patient data to reimbursers or other care providers 7. Transfer of medical patient data to other care providers or professionals 8. ePrescribing (transfer of prescription to pharmacy)	Average of component indicators
Electronic storage of individual medical patient data	9. A2a - Symptoms or the reasons for encounter 10. A2c - Medical history 11. A2c - Basic medical parameters such as allergies 12. A2d - Vital signs measurement 13. A2e - Diagnoses 14. A2f - Medications 15. A2g - Laboratory results 16. A2h - Ordered examinations and results 17. A2i - Radiological images 18. A2j - Treatment outcomes	Average of component indicators
Electronic storage of individual administrative patient data	19. A1 - electronic storage of individual administrative patient	A1 value
Use of a computer during consultation with the patient	20. B2 - Computer use during consultation	B2 value
Use of a Decision Support System (DSS)	21. B3a - Availability of DSS for diagnosis 22. B3b - Availability of DSS for prescribing	Average of component indicators
Transfer of lab results from the laboratory	23. D1e - Using electronic networks to transfer prescriptions electronically to dispensing pharmacists?	D1e value
Transfer of administrative patient data to reimbursers or other care providers	24. D1a - Using electronic networks to exchange of administrative data with other health care providers 25. 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	26. D1c - Using electronic networks to exchange medical data with other health care providers and professionals	D1c value
ePrescribing (transfer of prescription to pharmacy)	27. D1d - Using electronic networks to transfer prescriptions electronically to dispensing pharmacist	D1d value

Dobrev, Haesner et al. 2008

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