Country Brief: Hungary

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About the *eHealth Strategies* study

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

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Executive summary

For Hungary the key roadmap for eHealth is currently the "New Hungarian Development Plan 2007-2013", as it includes the "Social Infrastructure Operational Programme" (TIOP) and the "Social Renewal Operational Programme" (TAMOP). In April 2009, the "Modification No.1"[1] of TAMOP was published and eHealth was specifically addressed in terms of the "[m]odernization of the health related IT-systems, with special regard to establishing the conditions for e-health and telemedical services and controlling the entitlement to services".

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

Health service providers use individual electronic health records. Data are not collected in a systematic way, across the health system; an interoperable record that could be accessed across the healthcare system or a general record that integrates all relevant data is not currently in use at a national level. In order to start connecting these local systems, a regional pilot was launched in 2006 where an inter-institutional electronic exchange system (IKIR), connected 38 healthcare institutions and participating GPs in the regions of Southern Transdanubia, Northern Hungary and Northern Great Plain.[2] The current focus is now on the integration of hospital information systems.

ePrescription in Hungary is presently at the planning stage. It has been designated, in various strategic documents, as a future task, but no action has been taken so far.

In order to meet international health standards Hungary introduced a standard EN 13606:2007-1, based upon the standard issued by the European Committee of Standardization (CEN), in 2007 under the direction of the Hungarian Standards Institution. The standardisation process is currently ongoing in Hungary, which is related to the state of the associated eHealth applications which are not yet in use.

In terms of telemedicine remote consultation and consultation videoconferences between healthcare professionals and call centres are currently in operation in Hungary. However, these are mostly at the local or regional level and are often used offline whereby the data is then transferred manually into the hospital information system. The development of telemedicine applications has been stalled by the lack of interoperability of systems and other issues.

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[1] The Government of the Republic of Hungary 2009

[2] BT Group 7 October 2008; Bennett 2009

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1   Introduction to the report

1.1   Motivation of the eHealth Strategies study

Following the *Communication* of the European Commission (EC) on "eHealth – making healthcare better for European citizens: An action plan for a European eHealth Area",[3] 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*[4] 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.[5]

On the more specific aspects of electronic health record (EHR) systems, the recent *EC Recommendation on cross-border interoperability of electronic health record systems*[6] 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.[7] 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)[8] - and a project on "Good eHealth: Study on the exchange of good

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[3] European Commission 2004

[4] European Commission 2007

[5] European Communities 2007

[6] European Commission 2008

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

[8] eHealth Priorities and Strategies in European Countries 2007

practices in eHealth"[9] 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 Hungary summarises the main findings and an assessment of progress made towards realising key objectives of the eHealth Action Plan. It presents lessons learned from the national eHealth programme, planning and implementation efforts and provides an outlook on future developments.

1.2   Survey methodology

After developing an overall conceptual approach and establishing a comprehensive analytical framework, national level information was collected through a long-standing Europe-wide network of national correspondents commanding an impressive experience in such work. For Hungary, Renata Anna Jaksa provided information on policies and initiatives and examples for specific applications. Currently, she is the director of the ICEG European Centre[10]. The Centre is an independent research institute, based in Budapest, providing economic research and consultancy services. In addition, a handbook containing definitions of key concepts was distributed among the correspondents to guarantee a certain consistency in reporting. For Hungary relevant information on policy contexts and health system situation, policies and initiatives as well as examples for specific applications was collected by the overall project lead - empirica in Bonn, Germany.

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

    A.   National eHealth Strategy

    B.   eHealth Implementations

    C.   Legal and Regulatory Facilitators

    D.   Administrative and Process Support

    E.   Financing and Reimbursement Issues

    F.   Evaluation

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

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

[10] ICEG European Center

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 Hungary 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 *Hungarian* 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[11]

Hungary is a Republic with four levels of government: The Central State Level (CSL) consists of the national parliament, central government, government departments and a range of central offices. Hungary is divided into seven regions, 19 counties, 22 cities with county rights and the capital city, Budapest. Finally, the local level consists of over 3.200 local governments. Hungary joined the European Union in 2004.

The organisational base of the current Hungarian healthcare system was created at the end of the 1980s as a result of the political, social and economic changes brought about by the collapse of the communist regime. The 1989 amendment to the Hungarian Constitution defined the principles and basic democratic structure of the new republic, the framework in which the healthcare system operates.

The box below summarises the key facts about the Hungarian healthcare system:

Key facts about the Hungarian healthcare system:[12]

Life expectancy at birth: 73.0 years

Healthcare expenditure as % of GDP: 7.4% (OECD 2007)

WHO ranking of healthcare systems: rank 66

Public sector healthcare expenditure as % of total healthcare expenditure: 70.6% (OECD 2007)

2.2 Healthcare governance[13]

For a long time discussions focused on the decentralisation of the healthcare system and the reform of the health insurance system. Now, the overall responsibility for state social welfare and healthcare provisions are assigned to the national level while the responsibility for local health services is assigned to local governments[14]. Consequently, the national government is the dominant regulator of health services, exercising statutory supervision over the Health Insurance Fund (HIF) and controls the National Health Insurance Fund Administration (NHIFA). In addition, it provides capital grants and delivers public health and some tertiary care services.

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[11] Gaál 2004; eUser 2005

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

[13] Ministry of Health and Social and Family Affairs 2004, Due to the Parliament elections of April, 2010, the governmental structure has changed, there are new ministries, but the change is very new, roles and competence areas are not fully defined yet.

[14] Local Government Act of 1990 and Act CLIV of 1997 on Health,

Decision making bodies, responsibilities, sharing of power

In Hungary, the healthcare system was managed and supervised by the Ministry of Health until May, 2010. Published on 25 May 2010, the Act of XLII of 2010 defined the new governmental structure and set up the Ministry of National Resources that took over the combined roles of the previous Ministry of Health, Ministry of Education and Culture, Ministry of Social Affairs and Labour (except for Labour Policy roles).

The activities of the Minister include the fulfilment of the health policy-related tasks of the Government. In this work the Minister manages, coordinates and organises the healthcare system, the scientific and research activities in the sector, health relating to social insurance (in cooperation with the Minister of Finance) and also manages the National Health Insurance Fund Administration, as well as performs all tasks related to them, established by law.

The Minister sets out the public hygiene and public health tasks, and is in charge of the public health programme aiming at the prevention of diseases, and all other tasks relating to health promotion. Furthermore, he controls the National Public Health and Medical Officer's Service, the agencies of healthcare with national competence, national institutes, health services provided in higher education institutions, health improvement research activities, and the Office for Authorisation and Administrative Procedures of the Ministry. The Minister also operates the National Health Council, the National Disability Council, and he exercises regulatory supervision over the Hungarian Medical Association and Hungarian Chamber of Pharmacists. In order to fulfill his social policy and family policy tasks, the Minister defines tasks related to social care, child protection, and ensuring equal opportunities for disabled individuals, develops the system of social institutional care and services and identifies development trends for them, and also elaborates a system of family benefits and child raising support.

The National Public Health and Medical Officer Service[15], operating as a public administration agency, performs mostly state tasks and implements a unified health administration system, with the following responsibilities: public health and epidemiology, regulatory licensing; sector neutral professional supervision; organisation, monitoring and control of prevention and health improvement (health protection, health education, health promotion). The NPHMOS has enforcement authority in the entire territory of the country concerning all natural and legal entities, as well as companies without legal entity (with the exception of armed forces and law enforcement agencies, but not the penal institutions, however, it has the right to perform sanitary inspections in these institutions, too).

The National Health Council is an organisation responsible for maintaining the continuity of long-term health policy and enforcing the rights of users of health and social services. The Council is a body involved in the development of the Government's health policy and decision making relating to the policy, by making initiatives and proposals, reviewing documents and giving advice, and analysing and evaluating the process of implementation of decisions. It has a very important role in identifying health improvement priorities, in which a professional consensus must be achieved.

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[15] Állami Népegészségügyi és Tisztiorvosi Szolgálat - Országos Tisztifőorvosi Hivatal [Public Health and Medical Services - The Chief Medical Office]

Healthcare service providers

In 1992, the district general practitioner's system of Hungary was replaced with the family practitioner's service, with two main objectives. In basic terms one of the objectives was the change of the relationship between the physician and patient with the introduction of the option to choose the family practitioner freely, and linking the remuneration of family practitioner to the number of patients on their lists. From 1992 residents of other districts could also apply into the practice of a particular family practitioner, while a patient living in the district of a family practitioner may choose the family practitioner of another district too.

As a result of this change, family practitioners have to compete for patients and for retaining their patients, and trust and satisfaction of patients with medical activities have become more and more important. Although free selection of the family practitioner can practically not take place in sparsely inhabited rural areas, the impact for the majority of the country's population was clearly positive.

The other main objective was to make family practitioners responsible for what is known as gatekeeper functions, as they became the first meeting point between the patient and the healthcare system, providing as much definitive care as possible, enabling family practitioners (in agreement with the patient) to decide on the use of the specialist services, thus making patient pathways more rational. For the time being the family practitioners' system cannot effectively fulfil its gatekeeper functions. Practices which have joined the managed healthcare model experiment (1999-2005) are exceptions from this general rule.

The middle level of the healthcare system is outpatient specialist care. It has two types: general and more specialised outpatient care. General outpatient care must be provided for patients near their place of residence, so that they can have access to it without endangering their health, and using public transport. In the framework of general outpatient care the patient, upon family practitioner referral (or referral by another physician providing continuing care to the patient), or upon patient self-referral, receives single or occasional specialist healthcare, involving continuous specialist care in the case of chronic diseases not requiring inpatient care. Special outpatient care is a health service organised for the treatment of diseases, that require special expertise or special financial, material and professional skills (special diagnostic background).

One of the most important objectives of the health reform is to reduce the flow of patients to hospitals through definitive services provided in primary care, and specialist outpatient care. However, the increase of performance of outpatient care has not reduced the use of inpatient care, which cannot be explained with changes in the age composition of the population, with the reasons being in the special features of the financing system. Not only hospitals operate ambulatory units, but facilities qualifying as outpatient institutions can also provide inpatient care services, or one-day surgery interventions.

Home care, which involves skilled nursing care by the physician's order in the patient's home or place of residence, has been financed by the National Health Insurance Fund Administration since 1996, and it has generally spread since 1998-99. The health policy objective of its development is to replace much more expensive hospital care.

In Hungary there are three levels of inpatient care. The lowest level of hospital care includes normal/territorial hospitals with basic departments, available for everyone within a 25-30 km range from their place of residence. The next level consists of county hospitals which, together with several Budapest hospitals, operate as regional centres for some disciplines. The national institutes and university clinical departments have both regional and national competences. The national institutes of health are responsible for curative, methodology and health policy tasks. The national medical institutes and university clinical departments are tertiary care facilities in their special areas. The county level hospitals, the national institutes and the university clinical departments formed the basis for the appointment of the "priority" hospitals during the 2006 reform measures.

Figure 1: Important features of primary healthcare organisation in Hungary

Political/administrative unit responsible for primary healthcare	Municipal responsibility.
Consumer Choice	There is a free choice of GPs. In terms of specialists, there is a mixed system.
Financing	Financing is based on health insurance contribution and tax. The funds are transferred to the health institutions by the NHIFA (National Health Insurance Fund Administration) GP-s are paid in a dominantly per capita based system
Public or private providers	Combination of publicly employed primary care providers and GPs in private practices. With strong predominance of private practices
Gatekeeping function of the GP	In earlier years, GPs did function as gatekeepers, but this function has been slightly modified. The Act CLVI par.89 states that the patient can visit a specialist either as being transferred there by a GP or upon his/her own decision.
Integrating health: initiatives for coordination	There is a National Public Health Programme, aiming at preventing from drug, alcohol and tobacco abuse, disseminating information on healthy diet and health safety issues. The programme also provides incentives for sporting, wellness and developing ergonomic workplaces.

2.3 Recent reforms and priorities of health system/public health

The Hungarian health sector is waiting for an overall and comprehensive reform for more than 20 years now. In the socialist period, the Hungarian healthcare system was run and financed by the state. After 1990 various reform measures were introduced. Although private service providers were able to enter the field, the healthcare system is still predominantly publicly-owned and state-organised. With the exception of GPs, the majority of healthcare provider institutions are own by local authorities. The most important problems faced by the health sector are: inequalities in the quality of service, uneven availability of trained professionals (and the challenge of brain drain), and the common use of informal payments for health professionals in order to receive better healthcare. Because of lack of a clear policy for distribution of funding for modernisation

and development, the level of health and eHealth services and infrastructure differs widely among Hungarian hospitals and even between departments in the same hospital.

The overall reform of the health sector has started; major steps have been introduced but sometimes later on changed or eroded, due to political distortions and disagreement among the various stakeholders. The reform process has not been completed, leaving the system vulnerable, with uneven problems of service provision and funding.

Currently ongoing reforms in the health and social care systems

Various changes, reforms steps have been taken in recent years[16], the most relevant ones regarding eHealth issues are the followings:

Hungarian hospitals are divided into two main categories: priority and normal/territorial. Priority hospitals take a central role, get more funding and have more specialists than normal (smaller, local) hospitals. A good collaboration of the two level would require a strong and integrated informatics and eHealth system to be introduced on a regional and then on the national level (not in use yet).

The reform measures started in 2006 focused at the following steps:

- A more systematic control over the social security status of patients (checking if insurance benefits are available for the given case), being possible only after having a good and reliable national database of eligibility (which is now fully put in use).

- Re-structuring the number of hospital beds (more in terms of chronic inpatient care, less for acute inpatient care) and an overall decrease in hospital beds. In the future, it was expected to raise the importance of good collaboration among various hospitals and a stronger emphasis on the application of telemedicine, home care tools. On the other hand, experiences indicated rivalisation rising over collaboration and political influences and choices distorting the optimal allocation of hospital beds and resources.

Some reform measures were later recalled, for example the introduction of "co-payments per visit" – a symbolic (approx. 1 - 1,50€) price to be paid at every out-patient visit or for each day spent in hospital. This amount could significantly increase in the outpatient service if further consultations or diagnostic procedures were needed. Political debate was very strong regarding the reform of the healthcare system, and the public – on a referendum on 9 March 2008 – voted against the above-mentioned co-payments and also blocked further reform measures, including privatisation efforts in the health sector. It is important to note that the Hungarian policy scene cannot be divided into two groups, "pro-reform" and "anti-reform", rather, the different political parties and the various stakeholder groups have different ideas about the steps necessary to take. The most common conflict takes place between health professional values and economic reality.

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[16] See for example: "The 2007-2009 Reform of the Hungarian Health Insurance System", available online at: Mihályi 2007, http://www.eum.hu/download.php?docID=1318.

2.4   ICT use among 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[17].

In terms of infrastructure, 100% of the Hungarian GP practices use a computer. However, only 49% of Hungarian GP practices make use of an Internet connection. Broadband connections have not yet fully arrived in Hungary. Only 36% of the Hungarian GP practices make use of this type of internet access.

More recent Hungarian survey data published by the Prime Minister's Office in 2009 found that 99.6% of GPs had an internet connection. This is partly due to regulatory measures: the tax authority as well as health authorities require reporting in an electronic way. Also, the validation of the Social Security card number requires access to the central database.

Electronic patient data storage is quite common in Hungary. The storage of medical and administrative patient data are the eHealth applications most frequently used in Hungary.

At least one type of medical patient data is stored in 99% of GP practices.

A computer is available in the consultation room in 83% of the Hungarian GP practices. It is actually used for consultation purposes with the patients in 65% of the practices. In Hungary, 83% GP practices use a Decision Support System either for diagnosis or prescription purposes (50% on average in the EU27).

In Hungary the electronic exchange of patient data via the Internet or other dedicated networks on the other hand is not yet well established. Only 12% of the GP practices receive results from laboratories. Even less, that is 2% of GP practices, exchange medical data with other healthcare providers electronically. ePrescribing is also used by only 1% of the Hungarian GP practices.

Only 1% of the Hungarian GPs exchange administrative data with other care providers. Hungary has a use rate of 5% for the exchange of administrative data with reimbursers.

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

Figure 2[18]: eHealth use by GPs in Hungary
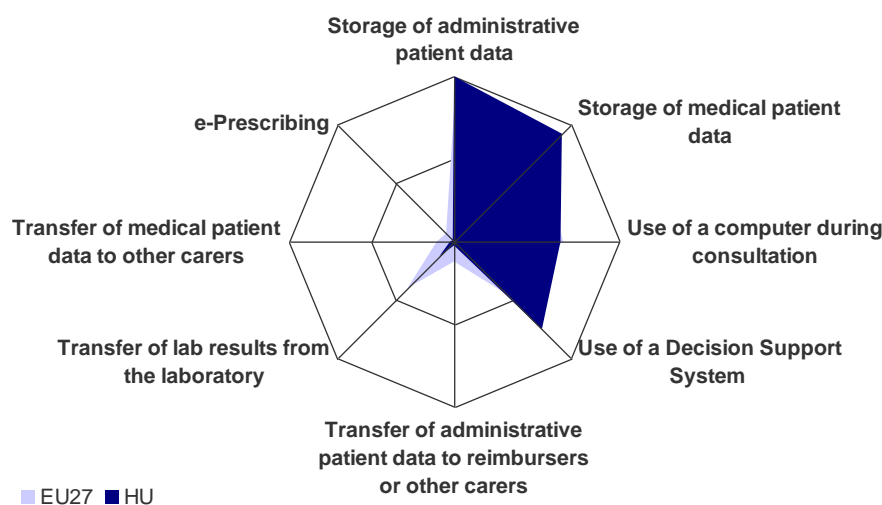
Indicators: Compound indicators of eHealth use (cf. annex for more information), % values. Source: empirica, Pilot on eHealth Indicators, 2007.

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 Hungary 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 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.

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[18] The notion of „compound indicator" designates an indicator built 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.

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

In Hungary, the field of eHealth is covered through different documents regarding administration, development or social renewal and mostly from an infrastructural perspective.

New Hungarian Development Plan 2007-2013, including TIOP and TAMOP

Out of these different documents, the key roadmap for eHealth is currently the "New Hungarian Development Plan 2007-2013", as it includes the "Social Infrastructure Operational Programme" (TIOP) and the "Social Renewal Operational Programme" (TAMOP). Thereby, TIOP defines the physical infrastructure and development strategy as well as funds for health and eHealth, while TAMOP describes the human infrastructure[19].

In April 2009, the "Modification No.1"[20] of TAMOP was published. Under the infrastructural chapter on the healthcare system, eHealth is specifically addressed in terms of the "[m]odernization of the health related IT-systems, with special regard to establishing the conditions for e-health and telemedical services and controlling the entitlement to services". In general, the modernisation or action plan for the operational programme has a more direct focus on eHealth. An important central project is the further development of a central electronic registry of health insurances. The electronic health insurance card was only planned in the Action Plan but not yet applied (see section 3.4.3 unterhalb).

Former National Development Plan, including HEFOP

Another important strategic planning document is included in the *former* "New Hungary Development Plan 2004-2006"[21], called "Human Resources Development Plan" (HEFOP). HEFOP is a counterpart of TAMOP in the earlier period of the use of Structural Funds. Among many elements that focused on improving health conditions, the most important to emphasise was an initiative "HEFOP 4.4.1", building a first regional pilot case for inter-institutional integrated hospital information system. In three regions (South-Danubia – 9 institutions, Northern Hungary – 20 institutions, North Plains – 9 institutions) started to run the pilot, which included:

- building integrated inter-institutional informatics infrastructure model system
- development and integration of various components of intra-institutional hospital information system
- ICT literacy and special IT trainings for the health professionals.

Rather related to infrastructural aspects of eGovernance are the documents from 2008: the "Framework Strategy for Informatics"[22] and the "ePublic Administration Strategy"[23].

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[19] The two go hand in hand, as they needed to be separated due to a European rule of a 10% limit of co-funding between European Social Fund and the European Regional Development Fund.

[20] The Government of the Republic of Hungary 2009

[21] The Government of the Republic of Hungary 2007

[22] Foreword of the Government Commissioner responsible for IT

The measures included in the documents focus mainly on electronising the administration of social and health obligatory payments and administrating health insurance coverage.

HISS Strategy targeting IT development in healthcare

Additional earlier documents are the "Hungarian Information Society Strategy"[24] (HISS) from 2003 in combination with a sub-strategy called "Health and Social Services".

HISS addresses the field of health by emphasising that IT development is seen as crucial element of healthcare and that it is aiming to create and operate:

- information sources, knowledge bases and expert systems supporting healthcare and the performance of workers in this sector;
- IT systems for the storage and processing of healthcare data;
- systems enabling the online transmission of data and information between healthcare institutions;
- systems enabling online contact between members of the public and healthcare institutions;
- IT support systems facilitating both healthcare and the administrative tasks of healthcare institutions;
- internal IT systems for social security;
- systems for online contact and data supply between the general public, the business sphere and social security institutions.

The above mentioned sub-strategy (2003), directly addresses eHealth. It provides a SWOT[25] analysis of technology deployment in the field of health, summarises the legal environment and refers to EU initiatives, such as the eHealth conference in 2003[26] and the "eEurope 2005 An Information Society for All"[27] document.

At regional level, there have not been any policy activities regarding eHealth, as regional governments have a rather limited role in policy-making.

In sum, various steps towards eHealth have been taken in recent years, but due to the election held on 11 April and 25 April 2010 the implementation of the current policy strategies can be changed and new strategies and policy directions may be identified.

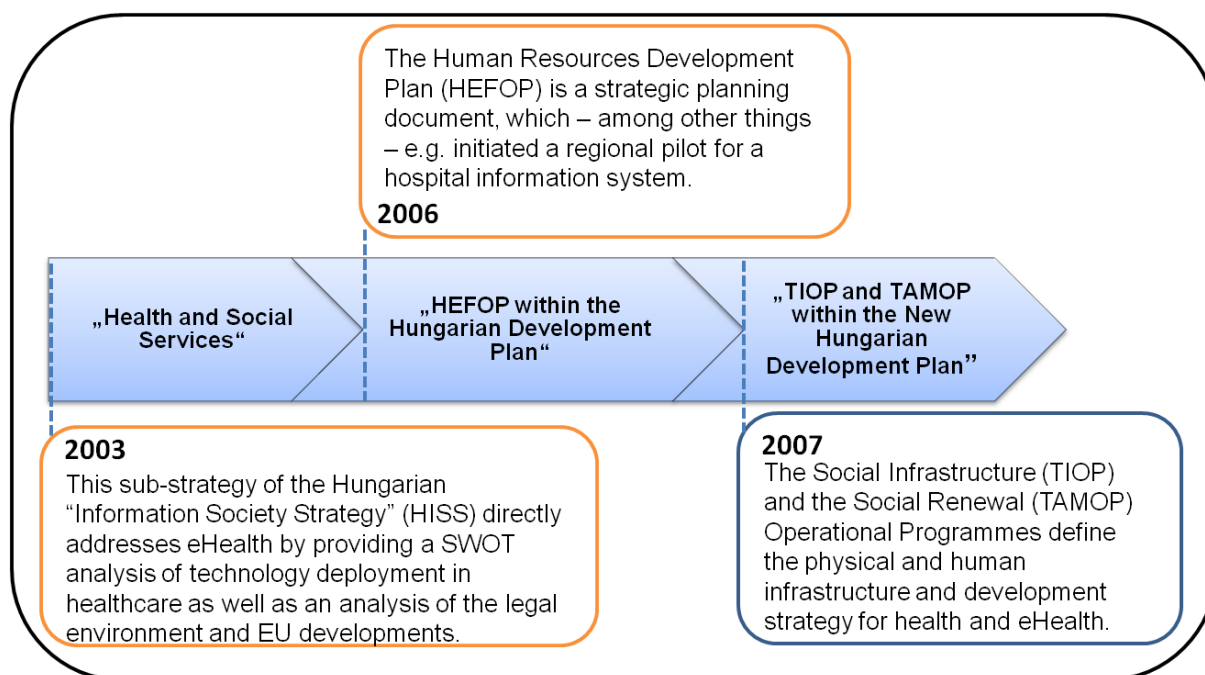
[23] The Prime Minister's Office 2008

[24] Ministry of Informatics and Communications 2003

[25] SWOT stands for Strengths, Weaknesses, Opportunities and Threats.

[26] European Commission 2003

[27] Commission of the European Communities 2002

Figure 3: Hungarian policy documents related to eHealth

The Human Resources Development Plan (HEFOP) is a strategic planning document, which – among other things – e.g. initiated a regional pilot for a hospital information system.
2006

„Health and Social Services"

„HEFOP within the Hungarian Development Plan"

„TIOP and TAMOP within the New Hungarian Development Plan"

2003
This sub-strategy of the Hungarian "Information Society Strategy" (HISS) directly addresses eHealth by providing a SWOT analysis of technology deployment in healthcare as well as an analysis of the legal environment and EU developments.

2007
The Social Infrastructure (TIOP) and the Social Renewal (TAMOP) Operational Programmes define the physical and human infrastructure and development strategy for health and eHealth.

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3.2 Administrative and organisational structure

In Hungary, there is no specific stakeholder responsible for eHealth – neither on the national nor on a regional level. Health and eHealth policy is formulated by several stakeholders: Until May 2010, the Ministry of Health[28] was the main responsible body for sectoral strategies. From May 2010, the Ministry of National Resources takes over these responsibilities. As far as central databases and services to citizens are concerned, the Office of the Prime Minister[29] is also a stakeholder in eHealth policy, mostly interested in the social security database and development of an eCard.

Ministry of Health, Office of the Prime Minister and Health Councils

On the regional level, Health Councils are responsible for (among other tasks) the coordination of health policy and stakeholders within a specific area, the distribution of the state-set normative of various domains of health services among healthcare units in the region, measurements of patient's satisfaction with health services, a yearly evaluation of regional health programmes and the provision of suggestions for health service improvement. All in all, there are 7 regions in Hungary: Central Hungary (that includes the capital, Budapest), Western Transdanubia, Central Transdanubia, Southern Transdanubia, Northern Hungary, Nothern Great Plain, Southern Great Plain.

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[28] Ministry of Health

[29] The Hungarian Prime Minister's Office

As eHealth is seen to a large extent as a technology aspect of health, further institution related to eHealth development include:

- National Development Agency
- National Institute for Strategic Health Research
- National Health Insurance Fund Administration
- Health Insurance Supervisory Authority
- Hungarian Chamber of Doctors
- Health service providers

The funding of eHealth initiatives by these institutions is ensured through structural funds from the European Union. Therefore, policy roles for financing are concentrated at the agency responsible for structural funds: the National Development Agency[30].

eHealth initiatives by these institutions financed through Structural Funds

Regarding the issue of stakeholder integration, various groups exist – from national and local policy makers to association of professionals and organisations to protect patient's rights. Their further involvement in eHealth activities depends on the restructuring and reform plans by the newly elected government. Before the election in 2010 there was no wide-range systematic consultation going on about the integration of the views of these stakeholders and these groups have often been in conflict with the Ministry of Health and its modernisation plans, this is starting to change.

The main barrier that eHealth development faces is a lack of strong and dedicated political support for health reforms in general. Reforms of the health system are ongoing and eHealth is often seen as only a technical part of it. Therefore, there is a need for a strong health policy that would help to achieve more financing, the integration of stakeholders and a commitment to the reforms in order to further develop eHealth.

3.3 Deployment of eHealth applications

3.3.1 Patient summary and electronic health record (EHR)

In this study, the epSOS project's definition[31] 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

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[30] National Development Agency

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

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.

Health services providers not connected to an integrated information system

In Hungary, there is no general, overall patient summary, as health service providers are not all connected to an integrated health information system. At the moment, the following data types – administrative information, medication records, medical history, laboratory, radiology results, etc – are stored in an electronic format to some extent. But in case of many health service providers, the information is not integrated even within the institution itself. The most common case is that hospitals run a hospital information system while running parallel a laboratory and/or PACS system, and there is no direct data transfer among them. The situation is even more complicated when several institutions are taken into account (nation-wide system) and several types of institutions should use the system (from high prestige clinics to GPs).

In sum, health service providers use individual electronic health records which may stay only on a character-based level or can also integrate picture-based information as well. Nevertheless the data are not collected in a systematic way, across the health system; therefore a general record of the patient that would integrate all relevant medical information is not in use at a national level.

Regional Pilot 2006 within EU initiative

In order to start connecting these local systems, there has been a regional pilot in 2006 under the EU initiative "IT Development in Healthcare in the Disadvantaged Regions" (HEFOP[32] 4.4.1 initiative). Here, an inter-institutional electronic exchange system (IKIR), based on Hungarian healthcare standards, connected 38 healthcare institutions and the participating GPs in the regions of Southern Transdanubia, Northern Hungary and Northern Great Plain.[33]

Currently, the focus of the developments and the main trend in policy is the integration of hospital information systems, where various diagnoses, treatments can be traced back and used by health service providers at various locations (with many limitations, for example regarding medical areas). It is stated that medical professionals would prefer storing and managing health information created in their institution in their own information system, and sharing only what is necessary with other actors/institutions. Their trust in the safety of their own recording is much higher than the trust in a central database where they lose the control over the data.

One of the main challenges for patient summary deployment in Hungary is standardisation and data transfer among different systems: Many health institutions use several information systems and among these systems there are Hungarian versions of

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[32] MAG - Hungarian Economic Development Centre Ltd 2009

[33] BT Group 7 October 2008; Bennett 2009

internationally used HIS, but also programmes developed by domestic actors. Furthermore, continuous updates of the HIS programmes are an obstacle to healthcare providers, as technical or physical IT does not always match a newer version of the HIS and medical staff then tends to use the old and the new versions in parallel.

These procedures result in the fact that every time a patient moves a new set of data is recorded in the health institution at a new location, which leads to various sets of records in five to six institutions which are impossible to track back or integrate electronically.

All in all, hospitals in Hungary require a freedom of choice regarding their HIS to match the IT system already available and to apply integrated data management. Furthermore, isolated electronic records need to be integrated into the overall structure in order to compose a systematic set of information.

At the moment, there are legal incentives to migrate character-based HIS to graphic ones. As PACS and laboratory modules are often used separately from the general hospital information system.

Figure 4: Patient summary in Hungary
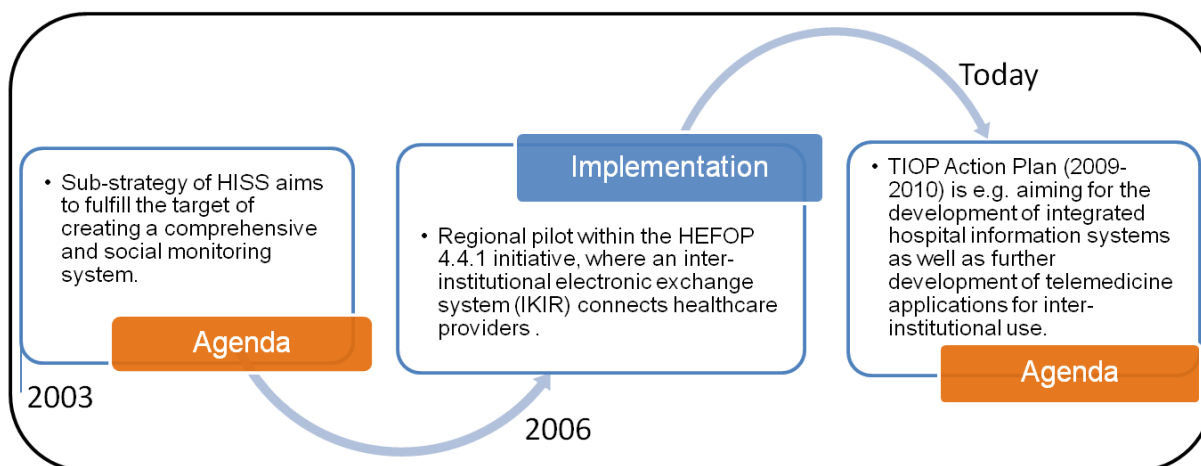
© empirica 2009

3.3.2 ePrescription

In the framework of this study and following work in epSOS[34], 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.

At the moment, ePrescription use is at a planning stage in Hungary. It is addressed in different long-term strategic documents for example in the "Hungarian Information Society Strategy" (2003) as a future task. But a launch of this eHealth application in the near future does not seem within reach, as recent policy document do not include ePrescribing as a feature of the eHealth infrastructure.

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

Development of standards for ePrescription

As the above mentioned HEFOP initiative also aimed to design protocols and standards for interoperability of the electronic data and services of the various regional players in the health and social care services, standards for ePrescriptions were elaborated in 2004. But due to management programmes of the project, not all originally planned functions of the HEFOP initiative were realised and – among others – the ePrescription solution was not introduced.

In April 2009, the format of the traditional paper-based prescriptions was changed and several hospitals had IT problems due to not having the appropriate printers to print the new version of the prescription. This shows that the implementation of an electronic system is far from realisation at the moment.

Figure 5: ePrescription progress in Hungary
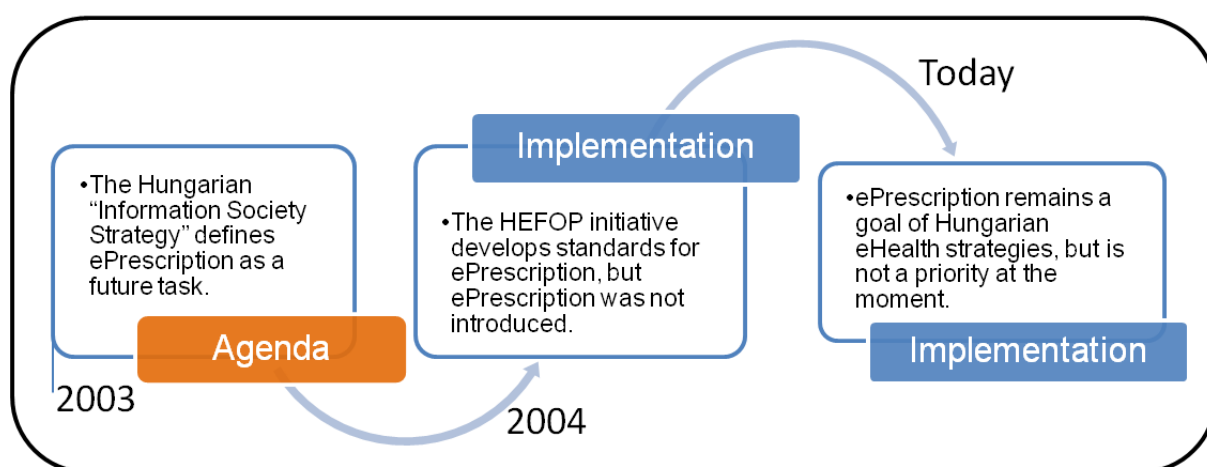
© empirica 2009

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.

Hungarian Standards Institution

The Hungarian Standards Institution[35] is responsible for the development of eHealth standards. From 2003 to 2006, the eHealth Programme Office, in the framework of the eHealth Programme, was in charge of standards related to health and eHealth. The Office was working under the auspices of the ESKI (National Institute for Strategic Health Research[36]). The status of ESKI and the eHealth Programme Office can be best described as a government mandated competence centre. The standards that have been developed can be purchased now from the Hungarian Standards Institution.

During the time, when the eHealth Programme Office was in charge, different pre-standards have been developed (MSZ E 22800) that focused on defining the data model

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[35] Hungarian Standards Institution

[36] National Institute for Strategic Health Research

used in information transactions among various health actors without defining the necessary data warehouses, actual data transmission channels or any aspects of the informatics infrastructure of the above mentioned actors.

Based on these pre-standards, the following standards were developed:

Hungarian eHealth standards[37]:

eMedical Records (MSZ E 22800-2:2004): an electronic standard defining the set of data that may be created and used by a wide range of health professionals including GPs and hospital medical staff.

eConsultation (eConsilium, MSZ E 22800-3:2004) is a set of data allowing for request of consultation from one health professional by another. The standard includes the necessary identification and management of the medical data.

eFindings (MSZ E 22800-4:2004) is a data set of examination findings.

ePrescription standard (MSZ E 22800-5:2004) aims to provide the necessary data set in order to allow the patient to purchase the prescribed medicine or medical equipment or services.

eFin (MSZ E 22800-6:2004) is a standard for a data set providing and transferring information about the costs of the health service regarding a patient by the health service provider.

Due to the need to follow international trends and to realise further improvements on health standards, in 2007 a standard EN 13606:2007-1 was introduced in Hungary, based upon the standard issued by the European Committee of Standardization (CEN).

Despite the development of standards, the Hungarian Standards Institution, which has the status of "body of public interest"[38], has the following tasks:

- Information service on general issues of standardisation, and the process, methodology and liaisons of Hungarian, European and international standardisation;

- Implementation of European and international standards as national standards, and development, reconciliation and publication of Hungarian national standards;

- Information on national and European laws related to standardisation;

- Dissemination by request of documents and information on Hungarian, European and international standardisation and standardisation in foreign countries;

- Direct involvement of market participants in European and/or international standardisation via the Hungarian Technical Committees for National Standardisation, in order to make possible the promotion of interests and to provide the forwarding of up-to-date information;

- Development of specifications for professional sectors;

The technology domains covered by the organisation spread from mechanical engineering to labour safety and quality management, and it also includes healthcare, telecommunication and information technology.

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[37] These standards were set in accordance with the pre-standard working documents of CEN TC 251 (prEN 14822-1:2003 (E)TC 251 WI 168, prEN 13606-1:2004 (E) and 13606-5:2004 (E)) and the Reference Information Model (RIM v2.02) of the HL7 organisation (US), meanwhile it also reflects the solutions of the open EHR (Reference Model and Archetype Model).

[38] According to the Law XXVIII of 1995 on national standardisation.

With respect to specific international and European standards used in Hungary, the following assessment applies:

International standards in Hungary:

HL7 v2 – is taken into account;

HL7 v3 – is taken into account;

Snomed CT – a Hungarian version based upon the 3rd version of US Snomed CT is available;

ICD 9 – is used under the local name: BNO-9;

ICD 10 – also used under the local name BNO 10 (this standard is the main coding used on for all prescriptions, etc.);

ICPM – is in use, local name is: OENO;

EN/ISO 13606 – accepted, with slight differences,

Other: open EHR /EHR Data Object

In sum it can be stated that the standardisation process is ongoing in Hungary, especially in terms of international standards, but as long as the related eHealth applications are not in use, these procedures cannot be validated.

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"39. 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[40].

Use of telemedicine to a limited extend – mostly in asynchronous solutions

In general the average number of telemedicine services available in one hospital is 3.8[41], whereas there is no connection between the location of the hospitals (in terms of more or less developed regions) and the number of services. To a limited extent the following telemedicine applications are available: remote consultation, consultation/ videoconferences between healthcare professionals and call centres. Due to a high level of independence of healthcare providers in Hungary, most telemedicine applications are in use at a local or regional level and are not connected through a national initiative. Furthermore, most tools are used offline and the collected data is then transferred manually into the hospital information system.

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[39] Europe's Information Society 2009

[40] European Commission 2008

[41] ICEG European Center has carried out a detailed survey on hospital information systems and telemedicine in Hungarian hospitals (publication forthcoming). The data presented below is based upon this research exercise. Twelve different telemedicine services were analysed (teleradiology, telecardiology, telepathology, electronic storage of laboratory findings, teleneurology, internet based consultation, telemonitoring, online access for family doctors, use of mobile equipment, online appointments, online access to documents and online access for patients).

In sum, it can be stated that in Hungary running distant diagnosis without seeing the patient face-to-face is not possible at the moment, as there is no appropriate set of examination findings electronically available.

There are some locally developed solutions, which are not centrally organised:

For example, within the framework of the Human Resources Development Operational Programme (HEFOP 4.4) in 2003 – a complex modernisation programme – the development of telemedicine infrastructure and the transfer of knowledge of how to use them were supported. Specifically, the telemedicine services of the pilot system were patient oriented: internet based equipment and methods were made available for patients suffering form chronic illnesses at home, using the eHealth Record as an anchor.

As the most important challenges for telemedicine in Hungary, the following issues were identified:[42]

> **Challenges for telemedicine in Hungary:**
>
> The development stage of the IT infrastructure;
>
> Lack of interoperability and standardisation;
>
> Unresolved legal and technical problems.

Generally, it can be stated that one reason for the relatively infrequent use of telemedicine is the low level of infrastructure. Compared to other services and manufacturing sectors, healthcare and social care have worse than average and deteriorating IT infrastructure indicators. The case is even worse because the existing IT infrastructure is very old and the average age of PCs, printers and electronic health tools are rather high. Because of fiscal and financial problems, the upgrading of IT instruments is postponed in many hospitals, which acts as a major bottleneck for the development of telemedicine. Further investments are also needed for getting broadband internet access, as slower internet causes problems in the speed and quality of transmission of the information, due to the large size of radiology files. In addition, funding is needed for software, required for the operation of the various telemedicine branches. In some cases, lower priced software is bought, which is not compatible with those required by telemedicine.

Another problem arises from the lack of interoperability. Within a hospital, laboratory findings are generally accessible, storable and transmittable between departments, but this is quite rare between hospitals. Hospitals use different informatics systems, which in itself poses problems in data and file exchange. Furthermore, incompatibility, lack of standards for the electronic format of laboratory and other findings also causes problems in the flow of information between hospitals and other healthcare institutes.

A further challenge is the lack of IT skills. Medical workers have relatively narrow professional IT skills and knowledge[43]. They can get through with their tasks and they are able to use the hospital information system and other informatics tools which are

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[42] Interview series carried out by ICEG European Centre in Hungarian hospitals (publication forthcoming)

[43] see above

necessary for their work. However, they are only familiar with small sections of the system; they do not have an overview of the whole process.

Regarding the problems with legal-technical issues, the most often mentioned barriers to telemedicine solutions is the issue of data protection (the use of safe transmission channels in case of those hospitals/institutions that are not connected directly) and the protection of data quality (especially in case of picture-based medical records – the zipping and copying of files may cause a decrease in resolution and can serve as a basis for medical mistakes).

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 Hungary and for which purpose.

3.4.1 Unique identification of patients

There are two ways to identify a Hungarian patient at the time. First, there is the national citizen-patient social insurance ID for social security (and consequently also health) purposes. It is called TAJ (Társadalombiztosítási Azonosító Jel[44]). Secondly, then there is an ID in the health system to identify specific patients with severe illness and low income or pension. This belongs to a special card called "Közgyógyellátási igazolvány", which can be translated as public health provision card.

The TAJ or social insurance ID number was introduced in 1992 and consists of a 9-character-code, which is given to every newborn and normally the same for the rest of your life. The number is generated by the NHIFA, who also keeps the data linked to the number: family name, given name, data of birth and the signature of the user. The ID is documented in a paper-based form, but also registered in an electronic database maintained by the National Health Insurance Fund Administration (Országos Egészség Pénztár, OEP). The paper social security card is valid together with the personal identification document. In the electronic database the citizen can and the healthcare provider must cross-check the validity of the health insurance of the patient before starting any treatment (except for emergency cases).The system is available online, in two ways: by direct registration and logging on to the OEP system, or (favoured by citizens) by using the "Client Gate", a one-stop-shop portal for public eServices in Hungary. In order to access the Client Gate, one must go once for a personal identification to a public office.

The OEP was, since transition, associated with different Ministries: First, it belonged to central state organisation and local governments (1993-1998), the Prime Ministers's Office (1998-1999) and the Ministry of Finance (from 1999) until finally it was put under the direction of the Ministry of Health in 2001. OEP is a central body, led by a director general appointed by the Minister of Health. The OEP is responsible for the operation of

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[44] Social insurance identification

the registry. The registry is in full use, being the first eGovernment-eHealth services introduced by the state.

ID connected to a health provision card

The second ID, which is given to patients with severe illness or low income/pension, is only connected to the special health provision card, not the holder. It is similar to the Medically Indigent Care Card (US) or to the Prescription Exemption Certificate (HC2 Certificate) in England. The card allows the holder to obtain medicine or special health/wellness services (e.g. thermal baths) for free up to a certain financial ceiling.

3.4.2   Unique identification of healthcare professionals

In Hungary, there is a non-electronic way to identify doctors, which is the ID number of their professional stamp, received after finishing university. This 5-character-long code is kept throughout their whole professional life and does not identify the hospital or the employer of the health professional, only the person. These numbers are also included in a nation-wide register, which also stores all prescriptions, medical findings on paper, or any documents issued validated by this stamp, besides the signature of the given doctor. The professional ID numbers of health professionals are registered at the Office of Health Authorisation and Administrative Procedures[45].

Identification of doctors through number on professional stamp

In addition, the stamp represents the right for practicing medical services. Doctors sentenced to shut down their activities are required to submit their stamps to the relevant authorities. Lost or stolen stamps must be immediately reported. Nurses and other health professionals – apart from doctors – do not have such a stamp and therefore such an ID number.

Furthermore, various health service provider institutions may use an independent ID number for their health professionals, most commonly to track the use of hospital information systems and to see who is entering what into the documentation.

Due to variety in central registers for doctors, non-consistency is often a problem after a while. The Hungarian eHealth strategy therefore intends to harmonise the central registers and to build a Certified Public Registry.

Chamber of Hungarian Doctors offers a member card with a chip

Regarding ID cards for health professionals, the Chamber of Hungarian Doctors[46] (MOK) introduced in 2006 a multi-functional professional doctors' card, equipped with PKI capabilities, the multifunctional Smart Card for Doctors (MSDC). In 2007, the obligatory membership in MOK for doctors was however abolished; due to which not all doctors have such a card today. MOK states that altogether 43 thousand chip cards have been distributed (although not all are in use).

The functions of the card are that 1) it certifies the membership in MOK and 2) offers authentication for entering the online information system of MOK. It was envisaged that the card could combine the functions of payment credit card with other functions like the storage of educational data, a digital signature, insurance data and a list of credit points regarding trainings. However, this idea to include a bankcard function was already abolished in 2006.

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[45] Egészségügyi Engedélyezési és Közigazgatási Hivatal

[46] Magyar Orvosi Kamara

3.4.3   The role of eCards

As basic health cards, Hungary has introduced the above mentioned public health provision card and the EHIC card, although the European one is not applied and not planned to be applied in domestic health relations[47].

eCard implementation as a political priority

A Hungarian eCard has not yet developed or deployed by now, but has been on the political health agenda for several year. The potential date of the introduction of such a card is a moving target: already in 2004 there were pilot projects regarding the use of the card, and latest information foresaw the introduction of the card by early 2010 – a date already passed.

Since there were elections for a new parliament in Hungary in April 2010, a new governmental set-up will most likely bring forward new, changed plans regarding the eCard issue.

No agreement so far on the card functions

One of the most important challenges and a reason why the eCard was not introduced to the health system is the existence of various, parallel ideas about the main functions of the card. There are no clear guidelines on what type of medical information a citizen should carry with him/her. It is advisable for people with special diseases, with allergies to have this information carried with them, written down somewhere, but it does not exist in an (electronic) card format. Furthermore, there is no central legislation or set of guidelines regarding information to be carried that can be useful in case of emergency, people rather tend to collect these advices, suggestions from health web portals, forum, blogs. Given this situation, some argued it should simply be a card holding the ID number, and no sensitive information should be stored on a chip. Health professionals complain[48] that patients forget to bring their paper-based health ID card, therefore it is not useful to store information on the card itself.

Others suggested that the card should have more than one function, using it as an electronic identification method for entering public eServices. This would require a wide consensus among all those actors and stakeholders providing these public (central/local) eServices.

The health insurance card plan has been cancelled, more precisely it is postponed until a standard European health insurance card will be fully specified

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[47] Some countries (like Austria) were capable of matching their EHIC with their domestic health ID card.

[48] Interview series undertaken by ICEG European Centre (publication forthcoming)

Figure 6: eCards in Hungary
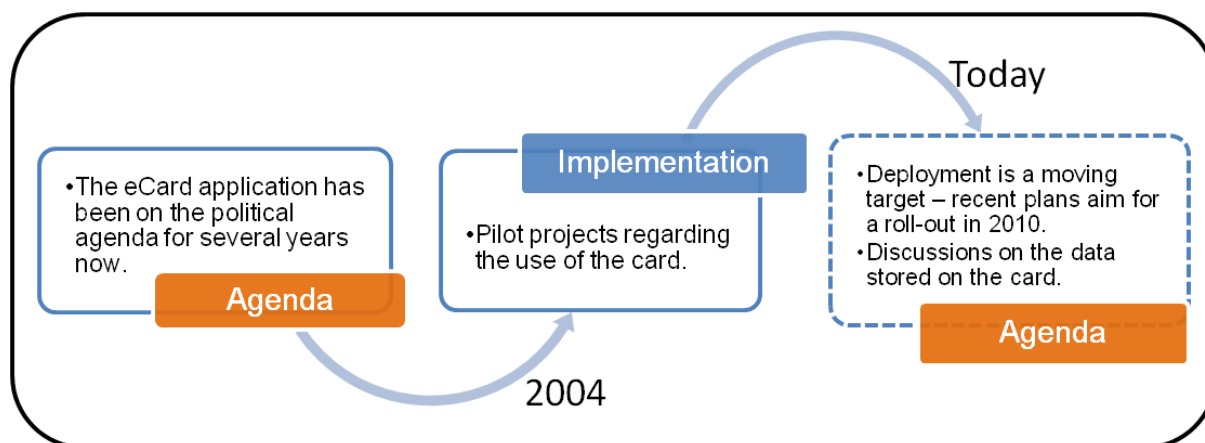
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3.5 Legal and regulatory facilitators

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.

Hungary does not yet have specific legislation on Electronic Patient Files, telemedicine nor ePrescription. Consequently, for example the division of responsibilities between doctors/specialists preparing a medical record/examination/picture and doctors/specialists analysing it from distance (e.g. teleradiology, teleneurology, telecardiology) is still an open question. Hungary does dispose of legislations on data protection and patient rights.

The most important national Acts in terms of patient data recording and management in Hungary are:

- Act LXIII of 1992[49] on the protection of personal data and the disclosure of data of public interest ensures the rights of the citizens to make decisions on the data stored about them.

- Act XLVII of 1997[50] on the Handling of Medical and Other Related Data describes in detail the methods of medical data recording and management.

The Hungarian data protection regime can be classified as one of the most rigorous in Europe and the regime was for a large proportion already in place before Hungary became a member of the European Union. In order to be fully in line with European legislation, Hungary did modify the Act of 1992 in 2003[51], when becoming a member.

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[49] Parliament of the Republic of Hungary 1992,

[50] Parliament of the Republic of Hungary 1997

[51] Council of Europe 1997

The main Hungarian data protection principle is the right to informational self-determination. In order to protect that right, the legislation requires that the patient is asked to consent, is appropriately informed about the management of his/her medical data and personal data related to it and has control over these data. The Act from 1992 defines that "personal data: shall mean any data relating to a specific (identified or identifiable) natural person (hereinafter referred to as 'data subject') as well as any conclusion with respect to the data subject which can be inferred from such data. In the course of data processing such data shall be considered to remain personal as long as their relation to the data subject can be restored". The law also states regulations for special data, data management, data transfer and deletion.

Another important aspect is the protection of the data while it is transferred. This is addressed in the second act mentioned above: the Handling of Medical and Other Related Data. In general, it defines that safe technology must be applied while handling sensitive data and the information about the transfer of any data that is not required by law has to be recorded and safely stored.

Furthermore the law from 1997 separates the procedures of data collection and management for various sub-sectors of the health system: for e.g. healthcare service providers, health treatments, public sanitation, epidemiology, research and development, health service/insurance administration it defines the rules of transfer of health related personal information from the health sector to any outsider. Further, the re-use of data is possible in some forms. As this is not defined in an integrated way, different institutions – and their R&D centres – sit on different data sets. Regarding health issues, clinics are in a very good position.

At the national level in Hungary, two basic sets of patient data are stored: 1) the health insurance status and 2) codes and short descriptions (e.g. place, doctor's name) of the health service actions, examinations carried out and medicine taken under the coverage of the national health insurance system. The results of the examinations and the diagnosis as medical data of the patients are at this moment not stored in a specific national patient data record system, but mainly at the individual health service provider where the data was created (a hospital, an in-patient service, a GP, etc.). In different pilots, medical data has been shared among various health service providers, though there is no nation-wide, integrated solution or database for this.

Decentralised/institutional registers are in charge of data protection and storage

In terms of data storage, Hungarian legislation specifies that data should be stored at the health service provider where the data was created. These decentralised or rather institutional registers are then in charge of protection and storage of those data. The head of the institution must nominate a person to be in charge of data management, storage and protection. The database at a national level covers all medical actions covered by health insurance and can therefore serve as a reference directory, pointing at the localisation of patients' data. However, this does not include medical data taken and stored at private health service providers.

The modified Act on personal data (Act XLVIII of 2003) states that pictures prepared and archived during medical services are defined as medical data and as such, can be transferred within health service institutions unless the patient prohibits that. In case of teleradiology services, the patient must be informed about the reason and place of transfer as well as of the medical staff who will access the picture.

3.5.1 Patient rights

In Hungary, patients have read-only access to their (full) medical records in form a paper-based copy (upon own costs) or on an electronic data tool[52]. This includes medical judgements and results of medical examinations.

Generally, the access to *electronic* patient records falls under the same rules as access to any patient record (paper-based). Thereby, the following security rules apply: The copy of the records must be safe enough to protect data, which implies that data cannot be transferred via email, only copied on e.g. CD, DVD, etc. and in case of picture-based medical data; these copies cannot be used again for diagnostic reasons, due to potential loss of information.

Patients have read-only access to their medical data

Access to medical data by others than the medical staff and the patient is very limited. On the one hand it is forbidden for any other person than those who are delivering the care or the medical service to the patient to access the data. On the other hand it is allowed for a representative of the patient to access the data during ongoing treatment or service, when they can provide a written authorisation only. After the end of the given health service, this representative must be entrusted by a private document providing full evidence issued by the patient to access the medical data, including the electronic ones of the patient.

Furthermore, there is a specific rule that allows the access of medical information by a spouse, a registered partner, a direct descendant/relative or siblings without the patient's approval. This applies when the information is needed for the diagnosis or treatment of a relative – for example if people living in the same household may be exposed to similar infections or poisoning, or because of identifying health problems with genetic background. Data of children or patients, who have a legal guardian, can also be accessed without consent.

In case of death, the legal representative, a close relative and heir of the patient can – based on a written request – ask for the documentation containing information about the treatment before the death, cause of death and any health information that is related to the loss of the patient. Upon their on costs, they can also ask for a copy of these documents.

3.6 Financing and reimbursement issues

As mentioned in earlier sections (3.2, 3.3.1), structural funds play a major role in Hungarian eHealth financing. As other domestic funds are limited, the financing – and therefore the strategic role – of the structural funds is crucially important for development of infrastructure and building eHealth solutions.

Structural Funds are crucially important for eHealth funding

The recent programming period of funds is set out for 2007 until 2013 and covers the following eHealth-related operational programmes: 1) Social Renewal Operational Programme 2007-2013 (Társadalmi Megújulás Operatív Program, TAMOP) and 2) the Social Infrastructure Operational Programme 2007-2013 (Társadalmi Infrastruktúra Operatív Program, TIOP).

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[52] Article 24, Act CLIV of 1997.

The latter operational programme, **TIOP**, is performed in parallel to TAMOP and one of its priority areas is the infrastructure of health with a distributed amount of €1148 million between 2007 and 2013. The action plan for the period 2007-08 focused on modernisation of hospitals (and within that, giving a special attention to emergency units). Besides old-building renovation, applicants were able to acquire digital medical tools, especially diagnostics, to set up internal IT systems together with integrated hospital management systems (or parts of that). In case of emergency units, electronic health monitoring tools at distant use, and other telemedicine infrastructure was highly priorised. In the Action Plan for 2009-10, further measures with a more direct eHealth focus were included. An important central project is the further development of a central electronic registry of health insurances.

TAMOP, the other operational programme, focuses on various social development targets, among them health and eHealth. One of the 6 priority areas addresses health, the "health preservation and human resource development in the healthcare system", which is representing about 5,4% of the OP budget (total: 4097 million EUR) for 7 years.

Domestic development funds

Further sources of financing in Hungary are domestic development funds, which are mostly needed as co-funding for the Structural Funds and the health fund. Another fund, which was made available by the European Union and supported Hungarian development is the PHARE[53] financing.

In terms of financing eHealth, a main challenge is the fact that fiscal imbalances of Hungary worsened as the recent economic crisis created serious funding problems. Furthermore, the demographics of the country are not in favour of collection of funds: apart from the overall-European issue of aging society, Hungary also has to face problems emerging from the low level of employment causing a case where a relatively small set of the society pays social security contributions.

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.

Structural Funds require strong evaluation activities

Generally, the Structural Funds given by the European Union require strong ex-ante, interim and ex-post evaluation to be applied in Hungary. This led to the assessment of the HEFOP, which build up a first regional pilot case for inter-institutional integrated hospital information system (see section 3.3.1 above) The final evaluation[54] in 2009 of this operational programme shows that some problems occurred during project realisation, which also showed in the fact that many planned application were not carried

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[53] Poland and Hungary: Assistance for Restructuring their Economies (PHARE) programme was created in 1989 to assist Poland and Hungary in their preparations for joining the European Union.

[54] Aquilis 2009

out in the end. Some of the concluding policy recommendations of the report are the following:

-   Finding a solution in order to maintain this level of health funding;

-   Establish a communication infrastructure, which is made public and people are encouraged to use it;

-   Higher involvement of the beneficiaries and professional preparation;

-   Define measurable parameters, which allow a detailed impact assessment and improvements as well as evaluate effectiveness;

For the recent period of Structural Funding, 2007-2013, the ex-ante evaluation of the health and eHealth related issues does not include any evaluation of projects carried out. The mid-term evaluation is currently ongoing, but results are not yet available.

It can be stated that a general policy problem in Hungary is that policies and strategies often lack the necessary follow-up and monitoring or evaluation, unless assessment is mandatory.

4   Outlook

In recent years, Hungary has had several initiatives, which were related to or directly addressed eHealth applications in terms of electronic patient records or the electronic health card. These were mainly financed through Structural Funds and co-financed through Domestic Development Funds. Thereby, political action is defined in Operational Programmes targeting different priorities – from the basic infrastructure for health services to the development of an integrated health information system.

Overall, it is apparent that in order to fully implement any eHealth application in Hungary, a basic healthcare reform has to be applied. This is related to the training of personnel and the update of the legal and technical framework.

In sum, there are unsettled decisions that have to be reached in order to proceed with eHealth deployment. These decisions are put on hold as Hungary has elected a new parliament on April 11th and 25th 2010. At that time, it can not be foreseen how the new political formation will affect the Hungarian healthcare system and further eHealth developments.

5   List of abbreviations

CSL	Central State Level
DRG	Diagnosis Related Group
EC	European Commission
EEA	European Economic Area
EHIC	European Health Insurance Card
EHR	Electronic Health Record
EMR	Electronic Medical Record
ERA	European Research Area
ESKI	National Institute for Strategic Health Research
EU	European Union
GDP	Gross Domestic Product
GP	General Practitioner
HCP	Healthcare Provider
HEFOP	Human Resources Development Plan
HIF	Health Insurance Fund
HISS	Hungarian Information Society Strategy
HPC	Health Professional Card
ICT	Information and Communication Technology
ID	Identification (e.g. number, card or code)
IHTSDO	International Health Terminology Standards Development Organisation
IKIR	Inter-institutional electronic exchange system
IT	Information Technology
MOK	Chamber of Hungarian Doctors
MSDC	Multifunctional Smart Card for Doctors
NHIFA	National Health Insurance Fund Administration
NPHMOS	The National Public Health and Medical Officer Service
OECD	Organisation for Economic Co-operation and Development
OEP	Országos Egészség Pénztár [National Health Insurance Fund Administration]
PACS	Picture Archiving and Communication System

PC	Personal Computer
PHS	Personal Health System
PKI	Public Key Infrastructure
R&D	Research and Development
SWOT	Strengths, Weaknesses, Opportunities and Threats
TAJ	Társadalombiztosítási Azonosító Jel [Social Insurance ID number]
TAMOP	Social Renewal Operational Programme
TIOP	Social Infrastructure Operational Programme
WHO	World Health Organization

6   Annex

6.1.1   Annex 1: Compound indicators of eHealth use by GPs

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

Dobrev, Haesner et al. 2008

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