

eHealth in Europe: Towards higher goals



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Abstract

Significant events are unfolding in the field of eHealth in Europe. eHealth has been a strategic priority of the European Commission in both the eEurope 2002 and 2005 Action Plans. But how are developments on the national level progressing? The authors contrast the status-quo of eHealth in the EU-15 with the latest trends and key action priorities in the EU-25 after the Union's latest enlargement in May 2004. The initiatives and actions of the European Commission are presented vis-à-vis those of national Member States, particularly in terms of strategic priorities and implementation actions. The review is accompanied by an analysis of expert feedback on eHealth drivers and barriers.

Health has become a prominent topic. Either in its own right or in the broader context of the Information Society it has attracted the attention of researchers, decision makers and policy advisers on both national and international levels¹⁻⁵. eHealth is a key focus area in both eEurope 2002 and 2005 Action Plans, developed by the European Commission and endorsed by the European Council⁶. The underpinning rationale has been that health care services, as an essential need of all European citizens, should be provided efficiently and made accessible to all, independent of geographical boundaries.

For more than a decade, a considerable amount of effort and resources has already been invested to advance European eHealth development, implementation and research. How much progress has been actually achieved and in which areas? What are the strategic goals for the future? Which barriers still remain to be overcome and what is being done to surpass them?

In the context of the MEDITRAV project,⁷ the Centre of Excellence in ICT in STAKES led a study that had the task of providing answers to these questions. The stage of eHealth development in Europe was investigated during the first quarter of 2003 through a review of available literature and policy documentation and complemented with a survey targeted at national experts in the field of health care

information and communication technologies (ICT). In our study we proposed the definition of eHealth as 'the use of information and communication technologies, in combination with computer networks, intended to promote health and support health care services delivery and use beyond organisational boundaries'⁸.

We present here a concise overview of the state of eHealth in the EU prior to the latest enlargement in May 2004, as well as of the most significant developments and trends that have been observed since.

Mapping eHealth in the EU-15

National Strategies

The development of a national strategy addressing broadly the application of information technology in health care began in several European countries around the mid-1990s. Reviews or updates have followed since (the list of relevant sources is available upon request). In most countries, the initiative has been led by the central government, with Ministries of Health and Social Affairs being most often the responsible body.

The following points are worth noting:

- Concomitant, although not necessarily co-ordinated initiatives frequently originate also from other departments of the government, such as Ministries of

Research and Development or Ministries of Education, Telecommunications, Public Administration and Finance.

- Some countries, due to their political-administrative system, have delegated responsibility of strategy development to the regional authority level (e.g. Belgium, Germany, Spain).
- A number of other stakeholder groups such as university and research groups, private companies and voluntary organisations and forums complement or substitute central government initiatives.

National strategies generally evolve around the following main targets or themes:

- a. electronic Health Records;
- b. communication infrastructures and networks;
- c. standardisation;
- d. security and privacy;
- e. research, national and international collaboration.

The focus towards applications addressed to citizens and patients, which by many has been perceived as one of the core elements of eHealth, was identified in the strategies of only a few countries (e.g. Denmark, Germany, Iceland, Ireland and the UK)⁹.

Infrastructure Networks

The provision of eHealth services is largely dependent on the presence of a suitable (i.e. secure, interoperable and technologically advanced) infrastructure. In 2003, national or regional secure networks were available in several countries. Regional health care networks were operational in countries such as Sweden, Norway and Germany. In Spain and Finland, regional projects utilised link directories to inter-connect distributed legacy systems. These were typically implementations based on closed private networks, using dedicated lines. Solutions using the public Internet were rare and often only limited pilots. Denmark, France, Iceland, Luxembourg and the UK had implemented a national secure network for health care. At the time of the study, seven of the EU Member States and (at that point) Candidate Countries did not possess a regional or national secure infrastructure for health care: Greece (with the exception of the island of Crete), Latvia, Lithuania, Malta, Portugal, Poland, Slovenia. Cyprus, the Czech Republic, Italy and the Netherlands, had various sector-specific networks (e.g. for banking, government etc).

Security Frameworks, Tools and Standards

A national security policy regarding the utilisation of information and communication technology had been introduced in most EU-countries. Member states had

Country	Status	National Strategy for health IT	Infrastructure (networks)	eHealth R & D Funding source*	eHealth services Reimbursement	Security Infrastructure	Standards
1. Belgium	CC	NO	Regional	Government †	N/A	YES	CEN
2. Cyprus	CC	YES	Regional	Government	NO	YES	DICOM, CEN
3. Czech Republic	CC	YES	Regional	Government	SOME	In progress	DICOM, HL7, national
4. Denmark	MS	YES	National	Industrial – Private	SOME	YES	DICOM, HL7, CEN, ISO
5. Estonia	CC	NO	N/A	Limited or no funding	NO	YES	DICOM, HL7
6. Finland	MS	YES	Regional	Government	SOME	YES	DICOM, HL7, ISO
7. France	MS	YES	National	Government	NO	YES	DICOM, CEN
8. Germany	MS	YES	Regional	Government	NO	YES	DICOM, HL7, CEN, ISO, regional communication standards
9. Greece	MS	NO	Regional (in progress)	N/A	NO	NO	DICOM, HL7
10. Hungary	CC	YES	N/A	N/A	In progress	In progress	DICOM, CEN, ISO (planned), HL7 (planned)
11. Iceland	EEA	YES	National	Government	SOME	N/A	ISO
12. Ireland	MS	YES	N/A N/A	N/A	YES	N/A	
13. Italy	MS	YES	Regional	Government	SOME	YES	DICOM, HL7
14. Latvia	CC	N/A	NO	N/A	N/A	N/A	N/A
15. Lithuania	CC	NO	NO	N/A	N/A	N/A	N/A
16. Luxembourg	MS	YES	National	Industrial – Private	NO	YES	DICOM, HL7
17. The Netherlands	MS	In progress	Regional	Industrial – Private	SOME	In progress	DICOM, HL7, ISO, IBIZ (local)
18. Norway	EEA	YES	Regional	Government	YES	YES	N/A
19. Malta	CC	NO	NO	Government	NO	N/A	N/A
20. Poland	CC	NO	NO	Limited or no funding	NO	NO	DICOM, ISO, HL7 (in progress)
21. Portugal	MS	NO		N/A	NO	NO	DICOM, HL7
22. Slovenia	CC	YES	NO	Government	NO	In progress	ISO, CEN
23. Spain	MS	YES	Regional	Government	NO	In progress (regionally)	DICOM, HL7
24. Sweden	MS	YES	Regional	Government	NO	YES	CEN
25. United Kingdom	MS	YES	National	Government	NO	YES	N/A

Figure 1: Overview of review key findings per country [status in first quarter of 2003]

Expected Benefits	Perceived Risks	Drivers	Barriers*
Information and Data; Increased: - Accessibility - Availability - Speed Impact on: • Professionals - optimise performance (accuracy, knowledge, expertise) • Citizens – Patients - optimise experience (empowerment, freedom of choice) • Health care systems - optimise resource use (quality – cost-effectiveness)	• Security • Privacy - Confidentiality • Risks of the online setting • Financial risks • Digital divide • Organisational inability to adapt	NATIONAL LEVEL • Progress towards unified Europe • Needs - preferences of future generations • Anticipated increase in citizen mobility • Country-specific characteristics (technology uptake) EU-LEVEL • EU as a unifying force - vision - co-ordinating bodies • Health care system changes - Integration - Cost-containment • Industry push • Citizens' needs	• Leadership - management strategy - harmonisation – co-ordination • Financial aspects - funding - reimbursement • Technology related - user friendliness - infrastructure - interoperability • Health care systems - professionals' resistance - heterogeneity • Cultural problems - relation to IT - organisational - linguistic differences • Legal - ethical issues - outdated legislation - variable legislation - ethical perceptions
<small>¹ Based on a questionnaire survey of 38 national experts in 18 EU Member States and Candidate Countries * Results on barriers are not distinguished on national and EU level since the same main themes were identified, only at a different level of complexity.</small>			

Figure 2: eHealth survey of national experts – Results Overview¹

implemented the Directive 95/46/EC on Data Protection¹⁰ and set up a corresponding office or authority. A law defining the framework for the use of digital signatures and certification services in accordance with EU guidelines had also been approved in most countries.

Only few EU-countries had defined a national security policy specific to health care: Denmark, Iceland, Luxembourg and the UK. Finland had launched a national project to develop requirements for the secure e-health communication platform and Germany had begun drafting a national security policy for health care. Finland and the UK had also started defining a national Public Key Infrastructure for Health Care. There was no harmonisation process of security policies in progress on the EU-level. The most commonly adopted standards in the reviewed countries are those presented in Figure 1.

Economic aspects of eHealth

Some form of funding for research and development of health-related ICT applications (but not necessarily for eHealth) existed in several countries. The primary source of funding per country can be seen in Figure 1, often however there is a mix of public and private funding.

The picture that emerged regarding reimbursement of eHealth services was rather discouraging: in most countries, there was simply no reimbursement available. An exception to the rule, Norway became in 1996 the first country to implement an official telemedicine fee scheme, making all telemedicine services reimbursable by the national health insurer. Few other countries were attempting to address the issue, primarily at the level of General Practice activities (as in Denmark and Finland). Further, limited examples existed in some countries (e.g. in Germany, Italy, the Netherlands,

Poland) and discussions or debates on the subject were underway in others (e.g. Estonia, Hungary and Luxembourg – primarily for reimbursement of radiological services).

Results of the national expert survey

In the 2003 survey the experts expected the benefits of eHealth to emerge as a result of accessibility and availability of data and increased speed of data exchange. Possible risks to data security and the potential infringement on citizens' rights to privacy and confidentiality were overarching concerns.

On the EU level, the vision of a united Europe, the need for health care system integration and cost-containment and industry push were perceived as main driving forces. The drivers identified on the national level were rather limited and national strategies were not always deemed commensurate to the challenges ahead (for a more detailed overview of the survey results, please see Figure 2).

Current trends – the EU-25

EU Developments

As of May 2003, the European Commission has launched the concept of the eHealth High Level Conferences that have been organised in collaboration with the country chairing the rotating EU presidency, as well as other Member States¹¹. These annual events are aimed to function as a reference meeting point for ministers and senior stakeholder group representatives, while a parallel exhibition showcases the latest achievements in eHealth applications across the EU. The 2003 conference in Brussels culminated with a declaration of the Health Ministers indicating their commitment to eHealth¹². In the 2004 conference in Cork, Ireland the Action Plan for a European eHealth area was

introduced. The Action Plan outlines specific targets to be achieved up to 2008 and beyond by both the European Commission and the Member States¹³.

Another important EU-level policy document also published in 2004 is the Communication on patient mobility¹⁴. In addition, there has been a working group activity concerning the use of ICT solutions in organising reimbursement of health care services when patients travel abroad in Europe.

The latest development concerns the launch of the 'i2010: European Information Society 2010' initiative, adopted by the Commission on 1 June 2005. The initiative concerns three main focus areas:

- a European information space, innovation and investment in ICTs and inclusion
- better quality of life with the aim of promoting the growth of the digital economy.
- Member States have been asked to define national Information Society priorities by mid-October 2005, in order to contribute to the objectives of i2010¹⁵.

National Developments

The third High Level eHealth conference co-organised by Luxemburg and Norway in Tromsø in May 2005 provided a follow-up point to the Action Plan implementation progress¹⁶

In the last few years there has been a clear shift from pilot projects towards nationally coordinated roadmaps aimed at the full development of ICT-supported health care systems. Regional networks have merged or evolved into national networks, as in Sweden and Norway. Further, initial pilots of cross-national networks have been launched, such as the Baltic Network between Denmark, Sweden, Norway, Estonia and Latvia, expected to be operational as of August 2005¹⁷.

It has been acknowledged that interoperability questions such as standards for health data messages and electronic health records need to be solved before there can be further advancement in the integration of European health information systems. An 'eTEN' development project called i2Health has been launched to promote trans-national co-ordination on interoperability matters¹⁸. Concrete application areas where interoperability challenges and their solutions are keenly explored are e.g. health smart cards and e-prescribing.

In the context of the European Health Insurance Card introduction, since June 2004 European travellers can access health care services while visiting another Member State on the basis of a plastic card that substituted the previously used paper forms. In parallel, the Netc@rds project is carrying out work towards the introduction of a common electronic card system¹⁹. During its current phase (2004–2007) pilot demonstrations and verification of interoperability amongst existing national card procedures are being undertaken with the participation of 10 countries. The proposal is to gradually upgrade current eye-readable cards to an electronic card starting in 2007 or 2008. Many countries are working intensively on the use of smart cards as security tools, such as France, Germany, Hungary and Slovenia. Typically, smart cards are used for identification of

patients and professionals both, but there are also plans to use chip-cards as portable means for patient data storage.

E-prescribing has also been a target area of interest for several Member States. Denmark and Sweden are leading the implementation field, with respectively over 70% and 45% of prescriptions being transmitted electronically. Finland, Germany, Norway, The UK, Slovenia and Spain are in various phases of piloting and planning further implementation.

Confidentiality and security concerns have come stronger to the foreground and it has been acknowledged that further development of eHealth will be hindered if the related problems are not solved^{19,20}. The questions of patient safety and quality of care have also been identified as issues that should be discussed together with eHealth²¹.

In terms of applications for use by citizens and patients, some progress has also been achieved.

The Commission's Directorate-General Health and Consumer Protection has arranged financing to support the development of the European Union public health portal that is expected to be launched by the end of 2005. In addition, national health portals for citizens and patients are already in operation or under development in several Member States.

Discussion

Several years after its original appearance, eHealth is still an evolving concept, meaning different things to different people^{22,23}. As the potential of networked and Internet-enabled healthcare is gradually unveiled, a radical change in delivering and eventually perceiving health and health care is also emerging. The emphasis is on a new concept of services, offered beyond geographical or other borders, for and by increasingly mobile citizens, patients and health care professionals, as well as health service providers. The longer term vision and aspiration is to make eHealth an inseparable part of daily health care practices.

Different levels of progress have been achieved across the reviewed countries in accomplishing these new goals. Overall, however, it can be said that European eHealth has not yet reached its full stage of maturity. National strategies and priorities need to be updated in order to encompass the requirements for meeting the challenges ahead. Substantial investments and efforts are required to bring the available infrastructure – technical, conceptual and regulatory– to the level of preparedness necessary for the support of future eHealth applications. In that context, co-ordination and collaboration are of the essence. A recently launched co-ordination Action, the eHealth ERA project addresses that need by offering support to the harmonized development of national eHealth implementation and Research and Technology Development roadmaps and promoting joint Member States' activities in the eHealth field²⁴.

Further, our knowledge on virtual eHealth services needs to be expanded, primarily regarding their feasibility, cost-effectiveness, acceptability and organisational and societal impact. The ways healthcare delivery is posed to transform in the future affect and should be of interest to us all. □

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