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**COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE
EUROPEAN PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL
COMMITTEE AND THE COMMITTEE OF THE REGIONS**

**e-Health - making healthcare better for European citizens: An action plan for a
European e-Health Area
(Text with EEA relevance)**

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COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

e-Health - making healthcare better for European citizens: An action plan for a European e-Health Area

1. INTRODUCTION

e-Health matters. It can improve access to healthcare and boost the quality and effectiveness of the services offered. e-Health describes the application of information and communications technologies across the whole range of functions that affect the health sector.

e-Health tools or solutions include products, systems and services that go beyond simply Internet-based applications. They include tools for both health authorities and professionals as well as personalised health systems for patients and citizens. Examples include health information networks, electronic health records, telemedicine services, personal wearable and portable communicable systems, health portals, and many other information and communication technology-based tools assisting prevention, diagnosis, treatment, health monitoring, and lifestyle management.

When combined with organisational changes and the development of new skills, e-Health can help to deliver better care for less money within citizen-centred health delivery systems. It thus responds to the major challenges that the health sector – which employs 9% of Europe's workforce – is currently facing.

e-Health is today's tool for substantial productivity gains, while providing tomorrow's instrument for restructured, **citizen-centred health systems** and, at the same time, respecting the diversity of Europe's multi-cultural, multi-lingual health care traditions. There are many examples of successful e-Health developments including health information networks, electronic health records, telemedicine services, wearable and portable monitoring systems, and health portals. Today, at least four out of five European doctors have an Internet connection, and a quarter of Europeans use the Internet for health information.

European Community research programmes have been supporting e-Health for the last fifteen years. The co-financing allocated since the early 1990s has reached €500 million, with a total budget about twice that amount. Many research results have now been tested and put into practice. This has put Europe in a leading position in the use of electronic health records in primary care and deployment of health (smart) cards. These developments have contributed to the emergence of a new "e-Health industry" that has the potential to be the third largest industry in the health sector with a turnover of €11 billion. By 2010 it could account for 5% of the total health budget. At present, the e-Health industry in Europe – mainly made up of small- and medium-sized enterprises – has a competitive advantage, but it still needs to enjoy a more favourable business environment.

Member States have shown that they are keen to take an e-Health agenda forward[2], drawing on best practices and experience from across the Union. This should enable a move towards a "European e-Health Area"; a framework built on a wide range of European policies and initiatives. In describing this European e-Health Area, an emerging framework for concerted actions and synergies in e-Health is envisaged that provides a favourable environment for the integration of related policies at a Community level. Since the health sector in Europe is a predominantly public sector service, most of the challenges and actions described in the Communication on 'The Role of eGovernment for Europe's future'[3] also apply here.

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[2] Ministerial Declaration at Ministerial e-Health 2003 Conference.
   http://europa.eu.int/information_society/eeurope/ehealth/conference/2003/index_en.htm.
[3] *The Role of eGovernment for Europe's Future*, 2003.

e-Health plays a clear role in the European Union's *e*Europe strategy, and is key to achieving stronger growth and creating highly qualified jobs in a dynamic, knowledge-based economy - the vision set out by the Lisbon European Council in March 2000[4] [5]. To move ahead, action will be required within several important policy areas that range from research and the roll-out of broadband networks in telecommunications, to action in public health, and work in Member States that promotes mobility and assesses the implications of European ageing on healthcare systems.

2. CHALLENGES AND EXPECTATIONS FACING EUROPE'S HEALTH SECTORS AND THE ROLE OF E-HEALTH

Healthcare systems around the globe face major challenges[6], even if their nature and scale varies significantly between industrialised and developing countries. For the Union these challenges include:

- rising demand for health and social services, due to an ageing population and higher income and educational levels. In particular, by 2051, close to 40% of the Union's population will be older than 65 years old[7];

- the increasing expectations of citizens who want the best care available, and at the same time to experience a reduction in inequalities in access to good health care;

- increasing mobility of patients[8] and health professionals within a better functioning internal market[9];

- the need to reduce the so-called 'disease burden'[10], and to respond to emerging disease risks (for example, new communicable diseases like SARS);

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[4] European Council (2000), *Presidency Conclusions*. Lisbon European Council. 23-24 March, 2000.

[5] COM (2002) 263 final. *eEurope 2005: An information society for all: An action plan to be presented in view of the Sevilla European Council, 21/22 June, 2002*. Brussels, 28.5.2000.

6 COM (2001) 723 final 05.12.2001, *The future of health care and care for the elderly: guaranteeing accessibility, quality and financial viability;*(6528/03, 20.02.2003) and *Joint report by the Commission and the Council on supporting national strategies for the future of health care and care for the elderly*. Within this context, the focus is on access to healthcare to everybody in an ageing society, with a high quality of health services and systems under conditions of higher expectations by citizens and shortages of health professionals, but with the necessary financial viability and sustainability of national health systems among all Member States in the long term.

[7] Braun, A; A. Constantelou, V. Karounou, A. Ligtoet, & J-C. Burgelman (2003) *Prospecting ehealth in the context of a European Ageing Society: Quantifying and qualifying needs. Final report*. November 2003. IPTS/ESTO: Sevilla, Spain.

[8] Patient mobility is addressed specifically in a Communication from the Commission, COM(2004), entitled *Follow-up to the high level reflection process on patient mobility and healthcare developments in the European Union*.

[9] Regulation 1408/71 that co-ordinates social security legal schemes has recently been amended to streamline and modernise access to health care across borders, particularly when undue delays occur in the patient's home Member State. In January 2004, the Commission adopted a proposal for a Directive on services in the internal market (COM(2004)2 final) which lays down a framework for the provision of services in the internal market, including health services, and for their reimbursement by the relevant health insurance institutions when healthcare is provided in another Member State. It should also be noted that, in March 2002, the Commission made a proposal on the recognition of professional qualifications (COM(2002)119 final) which includes medical professions.

[10] The disease burden is a measure of the health of a population and quantifies the total impact of disease in terms of incidence of mortality, disability, and the cost of illness.

- the difficulties experienced by public authorities in matching investment in technology with investment in the complex organisational changes needed to exploit its potential;

- the need to limit occupational accidents and diseases, to reinforce well-being at work and to address new forms of work-related diseases[11];

- management of huge amounts of health information that need to be available securely, accessibly, and in a timely manner at the point of need, processed efficiently for administrative purposes, and

- the need to provide the best possible health care under limited budgetary conditions.

This focus on e-Health is part of a broader recognition of the added value of action in the health field at a European level. This is reflected in the Community Public Health Programme referred to in Decision 1786/2002/EC[12]. In addition, the Commission has proposed further steps to support Member States in the on-going reform of health care systems. Progress should be monitored and benchmarked and the Commission has proposed applying the open method of coordination to health care and care for elderly persons[13].

The Spring Report 2004 offers further support for the *e*Europe action plan 2005, and the Lisbon strategy in improving health care and obtaining efficiency gains[14]. Although, according to Article 152 of the Treaty, and particularly its paragraph 5, Community action in the field of public health must fully respect the competence of the Member States in the field of health care, other developments – such as e-Health systems and services – can have an impact on health systems.

2.1. e-Health: systems and services that benefit the health sector

e-Health systems and services combined with organisational changes and the development of new skills are key enabling tools. They can deliver significant improvements in access to care, quality of care, and the efficiency and productivity[15] of the health sector. A recent large-scale survey identifies the very different ways in which different Member States systems and enterprises are addressing how the e-business aspects of e-Health can become key drivers for change, and productivity gains, in such areas as infrastructure and skills development, internal

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[11] The costs of accidents at work and occupational diseases are between 2.6% and 3.8% of national gross domestic product in the various European Member States. For further details, see Communication from the Commission on the practical implementation of the provisions of the Health and Safety at Work Directives. COM(2004) 62 final, February 2004.

[12] Decision No 1786/2002/EC of the European Parliament and of the Council of 23 September 2002 adopting a programme of Community action of public health (2003-2008), OJ L 271 of 9.10.2002.

[13] See the Spring Report 2004: *Delivering Lisbon*, COM(2004), 21.1.04. The Commission is taking forward these ideas in a Communication on the open method of co-ordination in the area of health care in 2004. The open method of co-ordination is designed to help Member States to develop progressively their own policies, and involves fixing guidelines, establishing quantitative and qualitative benchmarks, translating European guidelines into national and regional policies, and monitoring, evaluation and peer review – see European Council, 2000. *Presidency Conclusions.* Lisbon European Council, 23-24 March, 2000.

[14] Spring Report 2004: *Delivering Lisbon*, COM(2004), 21.1.04.

[15] eHealth systems and services can reduce costs and improve productivity in such areas as i) billing and record-keeping, ii) reduction in medical error, iii) alleviation of unnecessary care, and iv) savings achieved by business-to-business e-commerce, cited in P.M. Danzon and M. Furukawa, e-Health: Effects of the Internet on Competition and Productivity in Health Care (2001) In *The Economic Payoff from the Internet Revolution*, the Brookings Task Force on the Internet, Brookings Institution Press: Washington.

business processes, procurement procedures and supply chain management, marketing and sales, and functions of the extended business[16]. As a public sector service industry, around 80% of the cost of the sector is human resources. In both the old and new Member States, 75% of all expenditure comes from public sources[17].

The amount and complexity of health-related information and knowledge has increased to such a degree that a major component of any health organisation is information processing. The health sector is clearly an information intensive sector which increasingly depends on information and communication technologies. These technologies are supporting progress in medical research, better management and diffusion of medical knowledge, and a shift towards evidence-based medicine. e-Health tools support the aggregation, analysis and storage of clinical data in all its forms; information tools provide access to the latest findings; while communication tools enable collaboration among many different organisations and health professionals.

2.2.   Empowering health consumers: patients and healthy citizens

Both as patients and as healthy citizens, people can benefit from better personal health education and disease prevention. They need support in managing their own diseases, risks – including work-related diseases – and lifestyles. A growing number of people are looking proactively for information on their medical conditions[18]. They want to be involved actively in decisions related to their own health, rather than simply accepting the considerable discrepancy ('asymmetry') in knowledge between themselves and health professionals. e-Health services provide timely information tailored to individuals in need. Specialised online resources are available for health education, safety and security at work,[19] and lifestyle management. The Commission has been active in establishing quality criteria for Health related websites[20] and accessibility of web sites[21].

Personalised systems for monitoring and supporting patients are also currently available – examples include wearable or implantable communication systems for continuous monitoring patients' heart conditions. These systems can help shorten or completely avoid the stay of patients in hospitals, while ensuring monitoring of their health status.

Having access to comprehensive and secure electronic health records has been shown to improve quality of care and patient safety. This will facilitate appropriate treatment of patients in providing health professionals with a better knowledge of the patient's history and of

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[16] Stroetmann K.A. and V.N. Stroetmann (2004) *Electronic business in the health and social services sector – Sector Impact Study No. 10-I (draft). The European e-business W@tch 2003/4*, European Commission, Enterprise Directorate General: Brussels/Bonn, February 2004.

[17] See footnote 15.

[18] Detmer, D.E., P.D. Singleton, A. Macleod, S. Wait, M. Taylor, and J. Ridgwell (2003), *The Informed Patient: Study Report*, Cambridge University Health, Judge Institute of Management: Cambridge, UK. March 2003.

[19] The European Agency for Safety and Health at Work offers a wide range of web resources on accident and diseases prevention and guides of best practices for both employers and employees. See http://europe.osha.eu.int/.

[20] Communication on *e*Europe 2002: Quality Criteria for Health related Websites http://europa.eu.int/information_society/eeurope/ehealth/index_en.htm.

[21] COM(2001) 529. *eEurope 2002: Accessibility of Public Web Sites and their Content*. http://europa.eu.int/information_society/topics/citizens/accessibility/web/wai_2002/cec_com_web_wai_2001/index_en.htm

previous interventions by other colleagues. If interoperable, given patient mobility, electronic health records will also improve conditions for treatment in other European Union countries.

2.3. Assisting health professionals

The priority of medical professionals is to offer best quality care within available resources and, above all – according to the Hippocratic oath – while doing no harm to the patient (*primum non nocere*). However, unfortunately, medical errors still occur. Some of these might be avoided[22] by making good use of e-Health systems that can provide vital information, alerts, and make best practices, expert advice and results of clinical treatment more widely available.

e-Health tools and applications can provide fast and easy access to electronic health records at the point of need. They can support diagnosis by non-invasive imaging-based systems. They support surgeons in planning clinical interventions using digital patient specific data, provide access to specialised resources for education and training, and allow radiologists the possibility to access images anywhere. Thus, the workplace is being redefined and extended. Digital data transfer enables more effective networking among clinical institutions across Europe, and the creation of a European network of centres of reference – as is planned in the Communication on patient mobility, which provides for this initiative. Electronic health records also enable the extraction of information for research, management, public health or other related statistics of benefit to health professionals.

e-Health can benefit not only health professionals but all the staff employed in the health sector including nursing, care, and administrative staff (in 2002, this was 17.5 million persons in the prospective European Union of 25 Member States or 9.3% of total workforce)[23]. Furthermore, e-Health can contribute to achieving a safer working environment for health practitioners. (In the European Union, health and social services have an accident rate which is 30% above the average by sector of accidents recorded[24]. Most accidents relate to infectious diseases and dangers, back injuries, and shocks and hazards associated with electrical equipment or compressed gases.)

2.4. Supporting health authorities and health managers

Health authorities and managers are responsible for the proper organisation and running of health systems. They do this against the background of increasing budgetary pressures and rising patient expectations. e-Health systems can play a major part in meeting those pressures by making the health sector more productive, and delivering better results with fewer resources. Unfortunately, the currently available paper-based information aggregation and processing has major limitations.

A proper management of public health and clinical health can be undertaken only on the basis of comprehensive and high-quality administrative and clinical data. Health authorities in Member States would benefit from better access to more comparable data on health issues.

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[22] Silber, Denise (2003) Comment améliorer le système de santé? Harvard University Colloquium, August 2003. *Espace Européen*, October 17, 2003.

[23] Labour Force Survey 2002, published in 2003. See also Employment in Europe 2003: http://europa.eu.int/comm/employment_social/employment_analysis/employ_en.htm.

[24] Communication from the Commission, *Adapting to change in work and society: a new Community strategy on health and safety at work 2002-2006*, COM (2002) 118 final, March 2002.

There is a need for data, and an underlying infrastructure, that help health authorities to collaborate – for example, on how to tackle communicable diseases.

Integrated and comprehensive data can be provided in good time using e-Health tools, such as electronic health records and support for care flow management. Automatic data extraction from electronic health systems that operate according to Europe's legal requirements on data protection and privacy[25] could provide missing data that facilitates proper evaluation of much-needed resources and eradicates the huge administrative burden of filling in separate forms for reimbursement – a clear example of a productivity gain to be achieved through e-Health systems and services. These initiatives form a definite trend in the aim to modernise healthcare systems[26].

Increased networking, exchange of experiences and data, and benchmarking, is also necessary at the European level in the health sector. Drivers for this include the need for improvements in efficiency, and the increased mobility of patients and health professionals under an emerging internal market in services. The situation requires the integration of clinical, organisational, and economic information across health care facilities, so as to facilitate virtual enterprises at the level of jurisdictions and beyond[27].

e-Health systems can empower managers by spreading best practices and helping to limit inefficient and inappropriate treatment. This is the single most important step in releasing resources and ensuring broad access for everyone to quality care. In addition, e-Health opens new opportunities for people who live in remote areas with only limited healthcare services, as well as marginalised groups (such as persons with different degrees of disability, whether minor or more severe[28][29]). e-Health is already proving in Europe and in the developing world that it can provide a platform for telemedicine services such as tele-consultations (second medical opinion); telemonitoring; and telecare, either in the home or the hospital[30][31].

2.5.   e-Health: the third largest industry in the European health sector

According to a recent study[32], e-Health is emerging as the new "industry" alongside pharmaceuticals and the medical devices sector. By 2010, e-Health spending may account for up to 5% of the total health budget of the 25 Member States from just 1% in 2000 (for 15

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[25] Data Protection Directive 95/46/EC. OJ L 281 of 23/11/1995.

[26] Spring Report 2004: *Delivering Lisbon*, COM(2004), 21.1.04.

[27] A. Rossi Mori. *Integrated clinical information systems: an essential resource – an opportunity for international cooperation*. Draft in preparation February 11, 2004 for publication in the Swiss Medical Informatics Journal. Spring edition 2004.

[28] Employment and Social Dimension of Information Society, eInclusion working paper, 2003.

[29] Braun, A; A. Constantelou, V. Karounou, A. Ligtoet, & J-C. Burgelman (2003) *Prospecting ehealth in the context of a European Ageing Society: Quantifying and qualifying needs. Final report*. November 2003. IPTS/ESTO: Sevilla, Spain.

[30] See L. Beolchi (editor) (2003) *Telemedicine glossary, 5th edition, 2003 working document. Glossary of concepts, technologies, standards and users*. Information Society Directorate-General: Brussels, Belgium, September 2003 for a wide variety of definitions particularly with regard to medically-based homecare.

[31] A number of best practices in the tele-consultation and telecare field were submitted as candidates to the eHealth 2004 conference, and are included within the associated exhibition. See, http://www.ehealthconference2004.ie and http://www.e-europeawards.org/.

[32] Deloitte and Touche (2003) eHealth. *Health Information Network Europe. Final report*.

Member States)[33]. European businesses have every opportunity to become leading global players in this new industry.

Information and communication technologies have played a key role in the pharmaceutical and medical device sectors. In drugs research, new technologies are helping scientists to simulate and aggregate data from clinical trials and to test new theories. The newest medical devices are equipped with powerful software that aids their performance and safety – for example, through remote monitoring of functions - and that provides decision support to health professionals and/or patients.

3. STATE OF PLAY

3.1. Examples of e-Health and its benefits

Fifteen years of regional, national, and international research and development in funding for e-Health in Europe have resulted in a wide number of applications that have been implemented in several Member States[34]. There are many good examples of e-Health initiatives at a national and regional level within the European Union[35]. Forty out of the over 180 real-life e-Health solutions submitted were exhibited at the e-Health Ministerial conference in 2003. Some support the use of smart cards, others are large-scale health information networks supporting services such as MEDCOM in Denmark, EVISAND in Spain, SJUNET in Sweden, and HYGEIANET in Greece[36].

There is considerable demand from Member States for further action to promote best practices and share experience in this area. Currently, for example, the Employment and Social Dimension of the Information Society collects best practices on the employment and social inclusion aspects of e-Health and healthcare in the knowledge society[37].

MEDCOM – Danish health information network

MEDCOM currently handles over 80,000 messages daily. 100% of hospitals, pharmacies, emergency doctors, 90% of general practitioners, 98% of laboratories, 55% of specialists, and 20% of municipalities are connected to it. MedCom enables hospitals to use electronic referrals, and avoid data re-entry. The professional quality of referrals has risen, and discharge letters are stored directly. The monthly status and number of

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[33] *The European e-Business Report - 2002/2003 edition. A portrait of e-business in 15 sectors of the EU economy* - 1st Synthesis Report of the e-Business W@tch. Luxemburg: Office for Official Publications of the European Communities, 2003. ISBN 92-894-5118-1; Empirica, SIBIS, *Benchmarking Highlights 2002: Towards the Information Society in Europe and the US*, May 2003. See http://www.empirica.biz/sibis/.

[34] A*pplications relating to health. Fifth research and development framework programme 1998-2002*. Final report. April 2003 edition. Information Society General-Directorate: European Commission, 2003.

[35] The proven benefits of regional (community, district, county) health information systems are discussed in the guide to the exhibition of the Ministerial e-Health 2003 conference.

[36] Silber, D (2003) *The Case for eHealth*. Presented at the European Commission's first high-level conference on eHealth, May 22/23, 2003. EIPA, Netherlands.

[37] To date, the High Level Group on the Employment and Social Dimension of the Information Society (ESDIS) has focused on the safe and healthy usage of information and communication technologies at work (SEC(2002)372 and (SEC(2003)652), as well as on the potential opportunities of online health services for disadvantaged groups (SEC(2001)1428), that is also referred to in a Council Resolution on e-Inclusion adopted in October 2001.

messages per month can be monitored at www.medcom.dk.

First studies suggest that MEDCOM has delivered substantial savings. In terms of human resources, more than 25 thousand person-months are saved. Given the average monthly employee salary of €3,350, this translates into savings of €22.5 million.

As the penetration of personal computers and use of the Internet in Europe increases, a critical mass of users - general practitioners, patients and citizens - is being created for the provision of online health care services. Eurobarometer surveys have shown a steady rise in the rate of Internet connections by general medical practitioners[38]. The 2002 Eurobarometer survey[39] showed that an average of 78% of EU medical general practitioners were online, with - at the highest levels - 98% in Sweden and 97% in the United Kingdom.

Internet and Health
% Medical Practices connected to the Internet. June 2002

	S	UK	FIN	DK	F	NL	I	A	IRL	LUX	B	E	D	P	EL
	98%	97%	94%	89%	76%	72%	65%	57%	57%	54%	50%	48%	42%	40%	24%

Source: European Commission (Eurobarometer, June 2002)
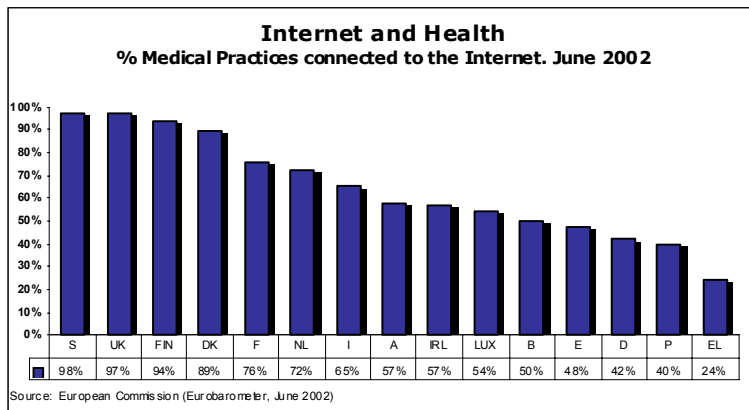
The use of networks, including the Internet, to deliver patient care is also growing. On average in the European Union of 15 Member States, 48% of medical practitioners use electronic health care records, and 46% use the Internet to transmit patient data to other care providers for the purposes of continuity of care. But a fully interactive use of the Internet to deliver care to patients through the provision, for example, of e-mail consultation (12%) or to enable patients to book appointments online (2%) appears to be only in its early stages. Figures ranging from 2000 to 2002 show the different levels of Internet connection among Europe's general practitioners, and the high levels of use for continuing education with low levels of use for telemedicine services.

Eurobarometer EU 15	2000	2001	2002
GPs with internet connection	44%	77%	78%
for continuing education	34%	70%	72%
to transfer patient medical data	9%	37%	46%
to offer telemedicine services	5%	7%	12%

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[38] Eurobarometer 2001-2003.
[39] Eurobarometer, 2002 http://europa.eu.int/comm/public_opinion/.

Health professionals are benefiting increasingly from applications that improve the services they offer and reduce medical risks in Europe. These include online registers or databases for cancer prognosis, and fully integrated hospital information systems such as COHERENCE in Paris, access to electronic 'libraries', archives or databases containing data on evidence-based medicine, electronically-assisted prescription reducing error and cost, and teleconsultation in a range of areas such as neurology, pathology, and psychiatry. Other examples of systems which can be used by patients and citizens, and other health consumers, include applications related to rare diseases, mental health forums and services, and primary healthcare call centres and kiosks such as NHS Direct in the UK.

NHS Direct Online

NHS Direct Online, http://www.nhsdirect.nhs.uk/ established in 1999, provides health information online and access to a 24-hour nurse helpline via telephone. Six million people have accessed NHS Direct Online website in about two years. There were half a million visitors in January 2003. The website has been available since July 2000. It gives information on over 70,000 physical national health service (NHS) sites providing health services to the public. NHS Direct call centres direct people to these physical offices. NHS Direct has also put 200 touch screen kiosks in popular locations, equipped with printers and accessible to wheelchair users. Locations include NHS centres, chemists, libraries, and supermarkets. Around 300 people use each kiosk every month, which adds up to around 60,000 users a year.

Systems such as these are giving patients more information about their condition and choices, so that they can take more responsibility for healthcare decisions. The March 2003 Eurobarometer survey[40] on health information sources shows that 23% of Europeans use Internet for health information. 41% of the European population considers that the Internet is a good source of information on health.

3.2. Major challenges for wider implementation

Despite the availability and proven benefits, e-Health systems and services are not yet widely used in real-life medical or health situations. In many places, development is still at a pilot phase, often financed through research grants. The speed of organisational change is often slow, and it can take up to twenty years to achieve full implementation. A broad range of challenges remain to wider implementation[41].

- **Commitment and leadership of health authorities**, in particular related to financial and organisation issues, are essential elements for the successful deployment of e-Health. For e-Health to improve the way healthcare is provided, it must be combined with organisational changes and the development of new skills in users. e-Health was often traditionally perceived by health authorities as a low spending priority. However, it is now seen as a matter of substantial importance within public health policies. There has been rapid progress over the last few years and many Member States – such as the United Kingdom and Slovenia – have now adopted strategic plans for the deployment of e-Health. Moreover, **organisational and cultural approaches** relating to the way health care is delivered varies between Member States and between organisations. Typically, in the

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[40] Eurobarometer 58.0, March 2003.
[41] I. Iakovidis (1998) Towards Personal Health Record: Current situation, obstacles and trends in implementation of Electronic Healthcare Records in Europe, In *International Journal of Medical Informatics*, vol. 52, no 123, pp 105 –117.

health area, the introduction of new applications, techniques, and medicines has been slow, yet – in organisational terms – the introduction of information and communication technologies has developed relatively fast. Hospitals too will be important players in the evolution towards e-Health, and their involvement in adoption will be central to new forms of healthcare delivery.

- **Interoperability of e-Health systems**. Interoperability should enable the seamless integration of heterogeneous systems. This will allow secure and fast access to comparable public health data and to patient information located in different places over a wide variety of wired and wireless devices. However, this depends on standardisation of system components and services such as health information systems, health messages, electronic health record architecture, and patient identifying services. Work has been launched within European standards organisations to answer this issue partly, but the take-up of e-Health interoperability standards has been slow and – in addition – to achieve actual interoperability is a separate task. Interoperable e-Health solutions should also support the technical platform for the implementation of such initiatives as the creation of a European network of centres of reference to promote co-operation across medical institutions across the Community[42].

- **User friendliness of e-Health systems and services**. A top priority for health providers in using an e-Health system is speed in getting the desired, high-quality results. There is an absolute need for fast connection, connectivity, and high speed. This highlights the importance of ensuring broadband connection for online health services and infrastructure for regional health information networks[43]. Configuring personal preferences to ensure usability is also key.

- **Lack of regulation and fragmentation of e-Health market in Europe**. Most e-Health solutions in the Union have either been designed by small- and medium-sized businesses or are developed internally by specific health organisations. The lack of standards and accreditation of products, together with different national regulations, have pushed up the cost of development and customisation. This has held the e-Health industry back from more substantial investment in e-Health solutions. Overall, health care systems are highly regulated through different forms of national regulation yet, at the same time, there is a need for improving legal certainty regarding the conditions for reimbursement of medical costs incurred in another Member State[44].

- **Confidentiality and security issues**. Firstly, the **confidentiality** and protection of patient data is governed by the general European Union rules of data protection, as well as by the requirements of ePrivacy legislation regarding communications infrastructure[45]. The requirement for confidentiality makes health information systems **security** critical. There is a provision within the general data protection directive to create a code of conduct for special domains such as health, but this has not yet been taken forward. Another important

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[42] These latter issues on centres of reference are addressed in a Communication from the Commission, COM (2004), entitled *Follow-up to the high level reflection process on patient mobility and healthcare developments in the European Union*.

[43] COM(2003) 65 final *Electronic Communications: the Road to the Knowledge Economy*.

[44] Article 23 of the Proposal for a Directive on services in the Internal Market (COM(2004)2 final, WP SEC(2003) 900 on the application of internal market rules to health services.

[45] See, for example, the *Data Protection Directive* 95/46/EC OJ L 281 of 23/11/1995; *Electronic Signatures Directive* 99/93/EC OJ L 013 of 19/01/2000; or the *Telecommunications Privacy Directive*, 02/58/EC OJ L281 of 31/07/2002 that replaced 97/66/EC.

legal issue is **liability** in the event of problems - such as technical malfunctions of the system, network, or provision of the service itself - that result in serious harm to a patient. While there are currently no specific guidelines or liability rules, as with any emerging or growing area of practice, only the increased use of e-Health applications and the performance of eHealthcare will make its potential fully visible as well as raising any remaining legal uncertainties[46]. The electronic commerce Directive[47], which creates a legal framework for the provision of information society services, also applies to the provision of online health services. The Directive, principally by virtue of its internal market clause, contributes to the legal certainty and clarity needed for the provision of online information society services throughout the entire Community. In particular, its provisions on information and transparency requirements, commercial communications, the liability of intermediary service providers, and the basic principles it establishes regarding electronic contracts, provide for high standards in the provision of online services in all Member States, thus also increasing consumer confidence. Further steps might be considered if they could show that even greater legal certainty would reinforce patient confidence in e-Health services. Similar safeguards for qualifications might also be useful. Building **trust** is a prerequisite to the development of an information society, in e-Health probably more than anywhere else. Citizens prefer services and information tailored to their needs and requirements, while knowing that their right to privacy is protected.

- Issues relating to the **mobility** of patients, including the cross border circulation of goods and services, among which e-Health services are of growing importance[48]. In this light, a European strategy is needed – which forms part of the current Communication on patient mobility - to ensure that citizens can exercise their rights to seek care in other Member States if they wish, and that European cooperation can help systems to work together to meet better the challenges they face. Regulation 1408/71 has been recently updated to take these issues into account: it provides a streamlined framework for the assumption of costs arising from cross border healthcare, based on the tariffs and fees in force in the Member State where the healthcare is delivered. However, to benefit from this equal treatment provision, the social security institutions may be allowed, in certain circumstances (most notably hospital care), to grant an authorisation prior to the delivery of the care. In addition, in January 2004, the Commission adopted a proposal for a directive on services in the internal market which deals with the cross border provision of health care services [49].

- Stronger cooperation among health providers across Europe is needed to enable wider implementation. Hence, the **establishment of European networks of reference**[50] - recommended by the high-level task force on patient mobility in its final report in 2003 – could provide healthcare services for conditions, in particular rare diseases, requiring a

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[46] Draft Commission Staff working document, *eEurope 2002: Legal issues in eHealth*. Unpublished.

[47] Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market (Directive on electronic commerce), OJ L 178, 17.7.2000, p.1.

[48] Patient mobility is addressed specifically in a Communication from the Commission, COM(2004), entitled *Follow-up to the high level reflection process on patient mobility and healthcare developments in the European Union.*

[49] See footnote 8. See also various European Court of Justice rulings such as Kohll C-158/96 (1998) ECR-1931 and Decker C-120/95 (1998) ECR-1831.

[50] These networks or centres for reference are envisaged as specialised care services to which patients from abroad are referred. See also, OJEU 15.3.2003 C 62/21. *Community action in the field of public health (2003 to 2008). Work Plan 200*3 (2003/C 62/07).

concentration of resources or expertise. Interoperable e-Health solutions will be needed to create the technical platform to implement such an initiative.

- **Needs and interests of users.** The take-up of e-Health systems and services would take place more rapidly were the needs and interests of the user communities (health professionals, patients, and citizens) to be taken on board. In general, these should be better integrated into the development and promotion of e-Health.

- **Access for all to e-Health.** The equal access of all groups of society to health services is an important goal in the public health policy field. There is a risk that certain parts of society - such as lone parents of families, isolated communities, inner city communities, individuals with literacy and numeracy challenges, groups of immigrants, homeless persons, elderly persons and disabled persons – could remain excluded from the possibilities offered by e-Health (including Internet-based health services) if special efforts are not made to counterbalance such trends. On the other hand, e-Health can offer considerable possibilities for the provision of health services to such individuals, groups, and communities.

- **Common understanding and concerted efforts by all stakeholders**. No single stakeholder can carry through implementation successfully on its own without the active co-operation of all the others. Each of the stakeholders, health authorities, professionals, consumers, industry, has the power to veto an implementation, if it is not perceived as beneficial**.** Only through concerted efforts by all stakeholders, can we ensure a successful implementation where all partners benefit, thereby creating a win-win situation.

4.   TOWARDS THE EUROPEAN E-HEALTH AREA: ISSUES AND ACTIONS

e-Health forms part of the European Union's *e*Europe strategy. It can play an important role in achieving stronger growth and creating jobs that require higher qualifications within a dynamic, knowledge-based economy. This vision was set out by the Lisbon European Council in March 2000[51]. Moving forward involves action over several policy areas ranging from research and the roll-out of broadband networks in telecommunications, to action in public health, and work in Member States promoting mobility of patients[52] and assessing the impact of ageing on healthcare systems. A number of the actions outlined in this document build on policy measures identified in the *e*Europe 2005 Action Plan – the reference point for commitment to advancing the information society at European level – especially in the areas of e-Health, e-Government, security, broadband, and development, analysis, and dissemination of good practices.

Though healthcare needs are different in scale and nature in developing countries, it is also worth noting that e-Health formed part of the results of the United Nations' World Summit on the Information Society in December 2003[53], and the World Health Organisation is now involved in a number of e-Health initiatives.

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[51] European Council (2000), *Presidency Conclusions*. Lisbon European Council. 23-24 March, 2000.
[52] See the Communication from the Commission, COM(2004), entitled *Follow-up to the high level reflection process on patient mobility and healthcare developments in the European Union.*
[53] World Summit on the Information Society, *Report* and *Plan for Action*, December 2003.

**4.1.	Action plan**

The actions outlined below should allow the European Union to achieve the full potential of e-Health systems and services within a European e-Health Area. There are three target areas:

- how to address common challenges and create the right framework to support e-Health,

- pilot actions to jump start the delivery of e-Health, and

- sharing best practices and measuring progress.

**4.2.	Issue 1: Addressing common challenges**

*4.2.1.	Health authorities leadership*

European Health Ministers have already shown e-Health leadership in their Ministerial Declaration[54] at the 2003 e-Health Ministerial conference. The ministers welcomed Commission initiatives to explore the possibilities to promote co-ordination at a European level. They proposed to meet the targets and objectives laid down in the eEurope Action Plan and in the Programme of Community Action in the field of Public Health (2003-2008) set out in decision 1786/2002, and liaise with other Community initiatives. The conference also highlighted the importance of monitoring and benchmarking progress by developing an open method of co-ordination in this area. These words must now be transformed into action on the basis of regional and national e-Health strategies.

By end 2005, each Member State is to develop a national or regional roadmap for e-Health. This should focus on deploying e-Health systems, setting targets for interoperability and the use of electronic health records, and address issues such as the reimbursement of e-Health services.

*4.2.2.	Interoperability of health information systems*

Member States have expressed the need to support actions that cover the development of standards addressing the interoperability of diverse systems and services and to explore in particular the possibilities of open source applications to achieve this objective. In this context, the need for future standards is clearly emphasised so as to solve interoperability concerns in a way which will benefit all stakeholders through the possible adoption of Open Source reference implementations for care services. In addition, an open and more free access to future and existing e-Health standards should be recommended, taking inspiration from models such as the World Wide Web Consortium[55]. The exchange of experience in the use of open standards and open source solutions among health administrations in Member States should be promoted.

4.2.2.1.	Patient identifiers

The need to identify a person unambiguously is an important component of the interoperability of health information systems. The *e*Europe2005 action plan already supports the development of standards for a common approach to patient identifiers and electronic health record architecture. The new European Health Insurance Card[56] includes a patient's

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[54] eHealth 2003, Ministerial Declaration, Brussels, 22 May 2003
	http://europa.eu.int/information_society/eeurope/ehealth/conference/2003/index_en.htm.
[55] http://www.w3.org/.
[56] OJEU of 27 October 2003.

personal identification number as part of the data allowing people to use the card to get treatment outside their home Member State.

By end 2006, Member States, in collaboration with the European Commission, should identify a common approach to patient identifiers. This should take account of best practices and developments in areas such as the European Health Insurance Card and identity management for European citizens.

4.2.2.2. Interoperability of electronic health records

Achieving a seamless exchange of health information across Europe requires common structures and ontologies[57] of the information transferred between health information systems.

By end 2006, Member States, in collaboration with the European Commission, should identify and outline interoperability standards for health data messages and electronic health records, taking into account best practices and relevant standardisation efforts.

4.2.3. Mobility of patients and health professionals

Within the European Union, patients and health professionals are becoming increasingly mobile. The Communication on patient mobility has made a number of proposals to manage the challenges resulting from this development. Recommendations include improving the exchange of information, and establishing specialised reference centres on health information.

The Communication on patient mobility is presented as part of an overall strategy on health care together with the present communication and that on the open method of coordination[58].

Work is already underway to improve information on patient mobility and mobility of health professionals at European level, and is being taken forward in particular through the health systems working party under the information strand of the public health programme.

4.2.4. Enhancing infrastructure and technologies

Building on *e*Europe's focus on accelerating the roll-out of broadband communications, full use should be made of broadband to support e-Health systems and services. Broadband networks carry large throughput and can also save critical time in accessing the network and give sub-second responses to information queries which can often be vital in the context of healthcare. They can bring considerable cost and performance benefits[59]. Availability and affordability are also key to wide deployment. Service level convergence (operators offering services on top of fixed lines or mobile telephony) opens up new possibilities for e-Health applications. Public authorities can play a role in stimulating both supply and demand for

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[57] An ontology defines the terms used to describe and represent an area of knowledge, and are used by people, databases, and applications that need to share domain information (a domain is a specific subject area, such as health or medicine). See http://www.w3.org/TR/2002/WD-webont-req-20020307/.

[58] The open method of coordination in relation to health care is addressed in the Communication from the Commission COM(2004) *Modernising social protection for the development of high-quality, accessible and sustainable health care and long-term care: support for the national strategies using the 'open method of coordination'* .

[59] GAO Highlights (2003) *Information Technology. Benefits realized for selected health care functions*. GAO-04-224, Report to the Ranking Minority Member, Committee on health, Education, Labor, and Pensions, U.S. Senate. United States General Accounting Office, USA. See http://www.gao.gov/cgi-bin/getrpt?GAO-O4-224

broadband, while Community funding may help to support broadband delivery in underserved areas. Programmes such as eTen[60] or the new IDABC[61] programme may also play a role in supporting e-Health applications and health information networks. The Commission actions will enable the deployment of Europe-wide computer-supported networks, based on broadband infrastructures and Grid[62] technologies.

> **During the period 2004-2008,** Member States should support deployment of health information networks for e-Health based on fixed and wireless broadband and mobile infrastructures and Grid technologies.

4.2.5. Conformity testing and accreditation for an e-Health market

There is need for a set of agreed attributes and norms beyond existing standards that define good quality products and services. Many countries have proceeded with accreditation of e-Health systems that are becoming models for other regions, such as those in the United Kingdom and Belgium. Another example of conformance testing and accreditation is the interoperability guidelines of Integrating the Healthcare Enterprise in Europe (IHE)[63].

> **By mid 2005,** the Commission should produce a summary of European best practices as guidance for Member States.

> **By end 2007,** a Member States should adopt conformity testing and accreditation schemes following successful best practices.

4.2.6. Leveraging investments

A shared approach among Member States to support and boost investment in e-Health is needed. Regional funding structures are already available[64] (for example, INTEREG III regional funds) in the European Commission, as well as a number of other international collaboration activities. Additional funding that could leverage e-Health developments could be sought at the European Investment Bank. The Bank is currently investing in a very wide range of eligible projects - if they represent cost-effective health policy gain. The World Bank also provides possibilities for funding international e-Health programmes both for the European Union and worldwide.

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[60] The primary objectives of the eTen work programme focus on the use of reliable information networks for health, public health, and prevention on a trans-European level. eTen concentrates on electronic health and insurance cards as part of reimbursement and management systems; paramedical support; online health systems; and homecare. Priorities in 2004 are to provide regional health authorities and health care providers with improved access to cross border health care through the use of 'smart' identification cards, electronic health records, cost-efficient health care, access to quality emergency medical data, and support to health authorities in assessing health needs and planning capacity. For more details, see http://europa.eu.int/eten/.

[61] COM(2004) 13 final, 2003/0147 (COD) *Common position of the Council on the adoption of a Decision of the European Parliament and of the Council on Interoperable Delivery of pan-European eGovernment services to Public Administrations, Business and Citizens* (IDABC). http://europa.eu.int/eur-lex/en/com/pdf/2004/com2004_0013en01.pdf.

[62] Grid technologies are defined as technologies that enable 'co-ordinated resource-sharing and problem-solving in dynamic, virtual organisations'. See Foster, I. and C. Kesselman (1999) *The GRID, blueprint for a new computing infrastructure*. San Francisco: Morgan Kaufman.

[63] See http://www.cocir.org/.

[64] See in particular, the provisions of the *Guidelines on criteria and modalities of the implementation of Structural Funds in support of electronic communications* (Doc. SEC(2003)895, 28.7.2003).

> **By end 2006,** a collaborative approach should be undertaken among Member States to supporting and boosting investment in e-Health.

4.2.7. *Legal and regulatory issues*

There needs to be a baseline set for a standardised European qualification for e-Health services in clinical and administrative settings. Furthermore, certainty of e-Health product and service liability within the context of existing product liability legislation would be beneficial. Information and communication technology developments should contribute to a safer working environment for practitioners; and greater legal certainty with regard to e-Health services within the context of freedom of movement of people, goods and services is increasingly necessary.

> **By end 2009,** the European Commission, in collaboration with Member States, should undertake activities to:
>
> - Set a baseline for a standardised European qualification for e-Health services in clinical and administrative settings.
>
> - Provide framework for greater legal certainty of e-Health products and services liability within the context of existing product liability legislation.
>
> - Improve information for patients, health insurance schemes and providers regarding the rules applying to the assumption of the costs of e-Health services.
>
> - Promote e-Health with a view to reducing occupational accidents and illnesses as well as supporting preventive actions in the face of the emergence of new workplace risks.

4.3. Issue 2: Pilot actions: accelerating beneficial implementation

4.3.1. *Information for citizens and authorities on health education and disease prevention*

In the context of its Public Health Programme, the Commission is preparing the establishment of a European Union-wide public health portal that will provide a flexible information technology platform to disseminate evidence-based information on public health relevant to European citizens, and to provide a single point of access to information on health.

The Commission is also co-funding the development of a set of quality criteria for health-related websites ('webseals'). Its aim is to increase transparency among health-related websites in the interest of serious service providers and users, ranging from citizens to health professionals.

Strengthening of the Health Surveillance System for Communicable Diseases, with a focus on the real-time collection of clinical and laboratory data and analysis, will enhance the capacity of early warning at national level and Community levels. It will improve the surveillance of diseases of major concern and potential bioterrorism threats.

Preparing valid and reliable statistical information on provision of health care at European level as requested by Member States and Commission Services alike will profit substantially

from the unique patient identifier, common standards, and protocols. Better information will then be made available to decision-makers and the interested public in a more timely way.

> **By end 2005,** a European Union public health portal will give access to European level public health information. Health portals shall offer dedicated information on safety at work and workplace health risks.
>
> **By end 2005**, there will be a strengthening of early warning, detection, and surveillance of health threats through enhanced information and communication technologies tools.

4.3.2. *Towards integrated health information networks*

Health information networks link hospitals, laboratories, pharmacies, primary care and social centres. Thus, they communicate in a secure manner. Examples include standardised messaging systems such as e-prescription and e-referrals or the provision of telemedicine services such as teleconsultation (the provision of second medical opinion) or telecare (the home monitoring of patients).

> **By end 2008,** the majority of all European health organisations and health regions (communities, counties, districts) should be able to provide online services such as teleconsultation (second medical opinion), e-prescription, e-referral, telemonitoring and telecare.

4.3.3. *Promoting the use of cards in health care*

There are two types of cards that may be used in the health care sector: health cards and health insurance cards. Health cards may carry emergency data (such as blood types, pathologies, treatments) or medical records, or may allow access to these data over a secure network. Health insurance cards allow access to health care and make management and billing easier.

In relation to the European health insurance card, decisions have been taken to kick off its deployment as from June 1st, 2004. It will replace all the current paper forms needed to benefit from medically-necessary care while on a temporary stay (for purposes of travel, posting abroad, study, and so on). On the health side, the *e*Europe 2005 Action Plan states that actions will be taken to build on the European health insurance card. Activities will be launched to support common approaches in Member States that are related to electronic health records, emergency data sets, and electronic patient identifiers.

> Promoting the use of cards in the health care sector. Adoption of implementation of an electronic health insurance card **by 2008**.

4.4. Issue 3: Working together and monitoring practice

4.4.1. *Disseminating best practices*

Success in developing a European e-Health Area will draw on sharing best practices and experience across the Union, as systems are deployed and organisations redesigned. The Commission must play a central role in spreading this activity. The experiences could be either bi-lateral or multi-lateral between or among Member States, since Member States may be at very different stages of development and implementation. Attention should be paid to

sharing experience in the use and impact of e-Health applications, and approaches to ensuring the interoperability of diverse systems and services, while respecting the multi-cultural and multi-lingual tradition of European health care systems. Open source applications may play an important role in achieving interoperability.

e-Health should be supported by the widespread dissemination of best practices. These should include the impact on access to healthcare and on its quality, assessments of cost benefits and productivity gains, as well as examples of addressing liability in telemedicine services, reimbursement schemes, and accreditation of e-Health products and services.

In 2004, a high level e-Health forum should be established, the role of which will be to support the Commission services. It should involve all necessary stakeholders, including at national, regional, or local hospital authority levels, thereby enhancing the understanding of the Commission services with regard to the current and planned status of development of e-Health in Member States. Its task should be to follow up the various roadmaps, and to identify further actions including a strong focus on users and access for all to e-Health, as well as to develop a strong evidence basis for the case for e-Health. The work of the e-Health forum will also be closely associated with the implementation of the Community Public Health Programme.

During the period 2004-2008, Member States with the support of the European Commission will organise special events such as high level conferences in order to disseminate best practices.

In parallel, **by the end of 2005**, the European Commission, with contributions from Member States, should establish an effective way of disseminating best practices and supporting actions within the European e-Health area.

4.4.2.   Benchmarking

Progress also needs to be measured. Appropriate benchmarking on citizens' awareness of e-Health, and how citizens are using e-Health effectively and efficiently is essential for future e-Health measures.

This means assessing and quantifying the added value that e-Health is expected to deliver. It also means reviewing how e-Health solutions are contributing to key health challenges, including in employment, access and equity. These measures should be accompanied by proper monitoring of e-Health's impact on health and health care in the Community. All stakeholders should have a role in this process which should feed in to further improvements in e-Health systems and services.

During the period 2004-2010, every two years, the European Commission will publish a study on the state of the art in deployment, examples of best practices, and the associated benefits of e-Health.

By the start of 2005, Member States, in collaboration with the European Commission, should agree on an overall approach to benchmarking in order to assess the quantitative, including economic, and qualitative impacts of e-Health.

4.4.3.   International collaboration

What we do in Europe on e-Health can have an important influence on meeting global health challenges within an information society. This can complement the work launched by the United Nations World Summit on the Information Society (WSIS) held in December 2003, as well as specific initiatives being developed by the World Health Organisation.

An assessment of e-Health developments should be completed ahead of the second part of the World Summit to be held in Tunis **in 2005**.

5.   CONCLUSIONS

e-Health offers European citizens important opportunities for improved access to better health systems. It can empower both patients and healthcare professionals. It offers governments and tax payers a means - through substantial productivity gains - to cope with increasing demand on healthcare services. It can also help to reshape the future of health care delivery, making it more citizen-centred.

The European e-Health Area will provide a framework for exchanging best practices and experience. It will allow common approaches to shared problems to be developed over time. This action plan focuses on specific actions to bring this about, so that by the end of the decade:

- The European Union will be well placed to measure the impact of e-Health in terms of better access and better, more efficient, services as well as on the overall productivity of the healthcare sector.

- e-Health will have become commonplace for health professionals, patients and citizens; and e-Health will be adequately resourced within healthcare budgets, and contribute to boosting wider objectives, such as competitiveness, jobs and cohesion.

Overview of actions

Action	Time	Responsibility
NB. Within each of the issues facing the e-Health sector (addressing common challenges, pilot actions, and working together and monitoring practices), we list the actions to be taken *sequentially*.		

Issue 1: Addressing common challenges		
The Communication on patient mobility is presented as part of an overall strategy on health care together with the present communication and that on the open method of coordination. Work is already underway to improve information on patient mobility and mobility of health professionals at European level, and is being taken forward in particular through the health systems working party under the information strand of the public health programme.	2004	Commission
By mid 2005, the Commission should produce a summary of European best practices as guidance for Member States.	Mid-2005	Commission
By end 2005, each Member State is to develop a national or regional roadmap for e-Health. This should focus on deploying e-Health systems, setting targets for interoperability and the use of electronic health records, and address issues such as the reimbursement of e-Health services.	End 2005	Member States
By end 2006, Member States, in collaboration with the European Commission, should identify a common approach to patient identifiers. This should take account of best practices and developments in areas such as the European Health Insurance Card and identity management for European citizens.	End 2006	Member States, Commission
By end 2006, Member States, in collaboration with the European Commission, should identify and outline interoperability standards for health data messages and electronic health records, taking into account best practices and relevant standardisation efforts.	End 2006	Member States, Commission
By end 2006, a collaborative approach should be undertaken among Member States to supporting and boosting	End 2006	Member States

investment in e-Health.		
By end 2007, Member States should adopt conformity testing and accreditation schemes following successful best practices.	End 2007	Member States
During the period 2004-2008, Member States should support deployment of health information networks for e-Health based on fixed and wireless broadband and mobile infrastructures and Grid technologies.	2004-2008	Member States
By end 2009, the European Commission, in collaboration with Member States, should undertake activities to: Set a baseline for a standardised European qualification for e-Health services in clinical and administrative settings. Provide framework for greater legal certainty of e-Health products and services liability within the context of existing product liability legislation. Improve information for patients, health insurance schemes and providers regarding the rules applying to the assumption of the costs of e-Health services. Promote e-Health with a view to reducing occupational accidents and illnesses as well as supporting preventive actions in the face of the emergence of new workplace risks.	End 2009	Commission, Member States
Issue 2: Pilot actions: accelerating beneficial implementation		
By end 2005, a European Union public health portal will give access to European level public health information. Health portals shall offer dedicated information on safety at work and health risks in the workplace. By end 2005, there will be a strengthening of early warning, detection, and surveillance of health threats through enhanced information and communication technologies tools.	End 2005	Commission
Promoting the use of cards in the health care sector. Adoption of implementation of an electronic health insurance card by 2008.	2008	Commission, Member States
By end 2008, the majority of European health organisations and health regions (communities, counties, districts) should be able to provide online services such as teleconsultation (second medical opinion), e-prescription, e-referral, telemonitoring and telecare.	End 2008	Member States

Issue 3: Working together and monitoring practices		
In 2004, a high level e-Health forum should be established, the role of which will be to support the Commission services. It should involve all necessary stakeholders, including at national, regional, or local hospital authority levels, thereby enhancing the understanding of the Commission services with regard to the current and planned status of development of e-Health in Member States. Its task should be to follow up the various roadmaps, and to identify further actions including a strong focus on users and access for all to e-Health, as well as to develop a strong evidence basis for the case for e-Health. The work of the e-Health forum will also be closely associated with the implementation of the Community Public Health Programme.	2004	Commission
By the start of 2005, Member States, in collaboration with the European Commission, should agree on an overall approach to benchmarking in order to assess the quantitative, including economic, and qualitative impacts of e-Health.	Start 2005	Member States, Commission
By the end of 2005, the European Commission, with contributions from Member States, should establish an effective way of disseminating best practices and supporting actions within the European e-Health area.	End 2005	Commission, Member States
An assessment of e-Health developments should be completed ahead of the second part of the World Summit to be held in Tunis in 2005.	2005	Commission, Member States
During the period 2004-2008, Member States with the support of the European Commission will organise special events such as high level conferences in order to disseminate best practices.	2004-2008	Member States, Commission
During the period 2004-2010, every two years, the European Commission will publish a study on the state of the art in deployment, examples of best practices, and the associated benefits of e-Health.	2004-2010	Commission