Building FOUNDATIONS eHealth in Europe

Report of the WHO Global Observatory for eHealth
Acknowledgements

Sincere thanks are due to more than 100 eHealth experts throughout the European Region who helped shape this report by sharing their knowledge through completing the first global survey on eHealth. Further, the undertaking of the survey required considerable coordination at the regional and national levels. WHO regional coordinators for Europe played a vital role in this process. Additionally, staff at WHO headquarters and external specialists provided support in the design of the survey instrument as well as technical input in their areas of expertise. Thanks are due to:


This report was prepared by the World Health Organization’s Global Observatory for eHealth, European Region by:

Angela Dunbar (secretariat), Misha Kay (secretariat), Kaarina Klint (consultant), Kai Lashley (editor), Jillian Reichenbach Ott (design and web publishing), Niels Rossing (consultant) and Rudi Samoszynski (consultant).

Photo credits:

Shutterstock
# Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive summary</td>
<td>vii</td>
</tr>
<tr>
<td>Findings at a glance</td>
<td>1</td>
</tr>
<tr>
<td>The Global Observatory for eHealth</td>
<td>5</td>
</tr>
<tr>
<td>GOe operational framework</td>
<td>6</td>
</tr>
<tr>
<td>Overall goals</td>
<td>7</td>
</tr>
<tr>
<td>The first global survey on eHealth: perspectives from the European Region</td>
<td>9</td>
</tr>
<tr>
<td>Purpose</td>
<td>9</td>
</tr>
<tr>
<td>Reporting results</td>
<td>9</td>
</tr>
<tr>
<td>Survey in brief</td>
<td>9</td>
</tr>
<tr>
<td>Respondents</td>
<td>10</td>
</tr>
<tr>
<td>Response rate</td>
<td>11</td>
</tr>
<tr>
<td>Discussion of the findings</td>
<td>15</td>
</tr>
<tr>
<td>Introduction</td>
<td>15</td>
</tr>
<tr>
<td>Foundation policies and strategies</td>
<td>16</td>
</tr>
<tr>
<td>Governance</td>
<td>16</td>
</tr>
<tr>
<td>Policy framework</td>
<td>18</td>
</tr>
<tr>
<td>Funding approaches</td>
<td>22</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>26</td>
</tr>
<tr>
<td>Enabling policies and strategies</td>
<td>29</td>
</tr>
<tr>
<td>Citizen protection</td>
<td>29</td>
</tr>
<tr>
<td>Equity</td>
<td>31</td>
</tr>
<tr>
<td>Multilingualism and cultural diversity</td>
<td>33</td>
</tr>
<tr>
<td>Interoperability</td>
<td>37</td>
</tr>
<tr>
<td>Capacity building</td>
<td>41</td>
</tr>
<tr>
<td>eHealth applications</td>
<td>44</td>
</tr>
<tr>
<td>Public services</td>
<td>44</td>
</tr>
<tr>
<td>Knowledge services</td>
<td>46</td>
</tr>
<tr>
<td>eLearning in health sciences</td>
<td>50</td>
</tr>
<tr>
<td>Provision of tools and services</td>
<td>52</td>
</tr>
<tr>
<td>References</td>
<td>55</td>
</tr>
<tr>
<td>Annex</td>
<td>57</td>
</tr>
<tr>
<td>Explanatory notes</td>
<td>58</td>
</tr>
<tr>
<td>Country profiles</td>
<td>60</td>
</tr>
</tbody>
</table>
Executive summary

Efficient high-quality health care delivery depends on well-designed health systems. Effective use of technology for health can achieve these goals through streamlining processes as well as offering entirely new ways of working. eHealth provides tools and solutions to improve health systems and services, such as respecting the rights of the patient (giving them more information about, and increased control over their health choices) and utilizing efficiently human, financial and other resources (1).

WHO defines eHealth broadly as the use of information and communication technologies for health. Although many definitions exist, there is wide agreement on a core principle: eHealth represents a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology (2).

The impact of eHealth is far-reaching and diverse. It includes health-information web sites, access to secure patient data, telemedicine and communications technologies, health institutional administration, decision support, cost savings and much more. It is not simply about technology, but about people working together; it is not a goal in itself, but a set of tools or means to reach defined ends; finally, eHealth is about the access to, and transfer of knowledge, not just about data collection.

eHealth can support diverse functions of the health system, such as strengthening its information, intelligence and knowledge processes such as through integrated hospital information systems and electronic health records. It should be an essential component of any health system reform or development plans and strategies. It is increasingly becoming an integral element of national health system objectives, and is becoming recognized as a key enabler in improving the quality and efficiency of public health services globally.

In 2005 the World Health Organization (WHO) Global Observatory for eHealth (GOe) coordinated the first ever global survey on eHealth, the results and findings of which are available in the publication Building foundations for eHealth: progress of Member States (3). Complementing the global publication, this report offers a more detailed analysis of the findings of the survey specifically how they relate to the WHO European Region.

This report is an essential survey-based tool for presenting an overview of eHealth uptake in the European Region. Its overall aim is to further WHO’s eHealth strategy of strengthening health systems; capacity building, developing norms and standards and fostering public-private partnerships as part of the overall framework for action detailed in the resolution on eHealth by the World Health Assembly (WHA) in May 2005 (4).

Given the GOe eHealth survey was the first of its kind, the Observatory was greatly encouraged by the number of Member States that responded – 112 countries, 26 of which were from the European Region (50% of Member States in Europe, representing approximately 64% of the Region’s population).

Although this first survey provides important insight into eHealth uptake across the Region, further and deeper evidence into eHealth strategy effectiveness and efficiency is required. The Observatory is committed to work with Member States to generate and disseminate relevant, timely, and high-quality evidence and information to support national governments and international bodies in improving policy, practice and management of eHealth.

---

1 The WHO European Region comprised 52 countries at the time of survey closure (mid-August 2006).
Findings at a glance

Strong political will for eHealth across the European Region

Evident in the findings of the survey is the political will behind the advancements of eHealth across the WHO European Region. There is a strong trend of policy adoption for all of the foundation, enabling and application action areas queried in the survey.

Inherent in this policy adoption is the certainty that information and communication technologies (ICT) are being seen as essential components of an integrated and well-functioning health-care system. Health authorities are increasingly incorporating information-based, virtual networks of health professionals, goods and services driven by the needs of their citizens, alongside the building of health facilities.

eHealth leapfrogging

Developing countries in the European Region are skipping over some of the eHealth activities that other, more developed countries struggled with in the 1980s and 1990s. Rather than trying to adapt their health systems to new technologies through entrenched ways of doing things, these countries can start ‘fresh’ with the technology of today. For example, countries currently building their ICT networks have not had to modernize their telecommunication and optic fibre systems to accommodate newer ways to transfer information. Wireless technology has made that unnecessary, and countries simply begin with this and move forward.

Survey findings from the European Region are in contrast to the findings from the global perspective in several ways. A consistent relationship was less evident across the Region between World Bank income groups and the introduction of eHealth actions by countries, for example. Further, in many cases countries in the upper-middle income group were found to be rapidly advancing in their eHealth development patterns relative to those in the high-income group. These countries, primarily made up of the new European Union (EU) Member States, illustrated a greater adoption rate of eHealth foundation-related policies including national information policies, ePolicies and eHealth-specific policies. They also had higher rates of adoption of standards, ICT affordability and translation and cultural adaptation policies. They illustrated remarkably higher access rates for knowledge services including online access to international and national journals and access to open archives. Finally, they appeared to be more inclined to provide ICT training for health sciences students, demonstrating, overall, an eagerness to adopt new health provision mechanisms using the domain of eHealth.

2 World Bank income groups are based on World Bank estimates of 2004 Gross National Income (GNI) per capita: (1) high income, US$ 10 066 or more; (2) upper-middle income US$ 3 256–US$ 10 065; (3) lower-middle income, US$ 826–US$ 3 255; and (4) low income, US$ 825 or less. These were the latest available data as at the time of analysis for Building foundations for eHealth progress of Member States (3).

Solid progress made in implementing foundation actions

The European Region as a whole has a higher rate of established national eHealth task forces than the global average, which places the Region in a good position to govern eHealth uptake, develop and implement eHealth policies, infrastructures and services. This is important because a lack of national eHealth task forces often leads to fragmented governance.

Similarly, the Region has a high rate of policy adoption compared to the global average for all three forms of policy queried (national information policy; national ePolicy; and national eHealth policy).

Public funding continues to be the most common source of financing for ICT in the health sector in the European Region. The importance of evidence-based eHealth project successes and examples of proven practices to assist ministries in their search for scarce funding resources should be articulated and encouraged.

The highest proportion of private funding is found among the lower-middle income group, which is opposite of what is found globally. The lower-middle income groups likely received substantial funding from development banks and agencies as well as the EU itself. Although private funding is utilized extensively in the Region, the rate of public-private partnerships is not; it is lower than the global average, as is the adoption and use of procurement policies.

Implementation of enabling actions needs attention

Enabling policies and strategies help citizens benefit from eHealth. This is the area of policy which is not well developed in the European Region. It will require concerted actions by governments to assure citizens that their (electronic) information is secure, incorporate multilingual and culturally diverse projects, adopt standards and interoperability measures and ensure greater equity in the provision of eHealth services.

To avoid the possibility of abuse of patient data through the misuse of technology, it is critical that citizen protection policies are introduced and enforced. Although the European Region currently has a higher than global average in citizen protection policies overall, only 70% of countries in the upper-middle and 33% of those in the lower-middle income group have implemented standards, regulations or legislation to protect the privacy and security of patient data.

For eHealth services to be accessible to all, equity and multilingual measures need to be in place. Currently, only half of the respondents in the upper-middle category have equity policies and not one from the lower-middle group does. Multilingualism and cultural diversity is the least developed area of eHealth surveyed. Special attention is needed to promote the necessary policies and related projects which directly affect citizen access to information so as not to exclude them from health information services based on language barriers.

eHealth services can only fully function through actual and sustainable interoperability within and between health systems. The European Region shows a much higher overall percentage of countries adopting norms and standards for eHealth systems, services and/or applications than the global average. At the time of the survey, all responding countries stated they would have adopted standards for eHealth by 2008, Future surveys may well show this to be the case.

eHealth services can only be used effectively and efficiently if the health professionals using them have been given adequate training. The lack of ICT-literate health professionals is one of the most frequently cited problems by responding Member States and is a significant barrier to eHealth implementation at all levels.
eHealth applications for the citizen

eHealth applications are those provider services, knowledge services and public services that directly impact the citizen. The range of eHealth applications is extensive and only a small subset was addressed in this survey.

Providing health information online to the public has significant potential to increase access to health services. The European Region is relatively advanced in making efforts to enhance the accessibility, quality and reliability of health information content.

As far as providing online international health sciences journals to students, researchers and practitioners, the European Region shows a higher rate of these specialist services than the global average. Effort is still needed, however, in making national electronic journals more accessible within countries and internationally, as well as creating national open archives for health publications and data.

eLearning in the health sciences has grown rapidly in recent years though the lag in the lower-middle income countries is considerable. Member States are urged to incorporate eLearning methods, where appropriate, into their training of health sciences students as well as for the ongoing training of health professionals.

European Member States were also surveyed to assess which WHO provided eHealth tools and services could offer the most benefit to them. Responding Member States would welcome active involvement of WHO to provide services in the areas of effective/best eHealth practices, trends and developments in eHealth, as well as advice on methods for monitoring and evaluation of eHealth services. Additionally they indicated that (in principal) the following generic applications would be most useful: decision support systems, national drug registries, national electronic registries and Telehealth.
The Global Observatory for eHealth

In May 2005, the Fifty-eighth World Health Assembly adopted Resolution WHA58.28 (4), which established an eHealth strategy for the World Health Organization (WHO). The resolution urged Member States to plan for appropriate eHealth services in their countries. That same year, WHO launched the Global Observatory for eHealth (GOe), an initiative dedicated to the study of eHealth – its evolution and impact on health in countries. The Observatory model combines WHO coordination both regionally and at headquarters to monitor the development of eHealth worldwide, with an emphasis on individual countries. WHO recognizes that eHealth is rapidly transforming the delivery of health services and systems around the world, and is therefore playing a central role in shaping and monitoring its future, especially in low- and middle-income countries.

The Observatory’s mission is to improve health by providing Member States with strategic information and guidance on effective practices and standards in eHealth. Its objectives are to:

- provide relevant, timely, and high-quality evidence and information to support national governments and international bodies in improving policy, practice and management of eHealth;
- increase commitment among governments and the private sector to invest in, promote and advance eHealth;
- generate knowledge that will significantly contribute to the improvement of health through the use of ICT; and
- disseminate research findings through publications on key eHealth research topics as a reference for governments and policy-makers.

The Regional Office for Europe acts as a coordinating body for the Observatory’s work within the European Region.
**GOe operational framework**

Figure 1 illustrates the operational structure of the GOe. The GOe Secretariat was established in 2005. The Strategic Advisory Group of Experts (SAGE) comprises experts from both the public and private sectors and represents eHealth practitioners, researchers and policy-makers from across the globe. The Secretariat is based at WHO headquarters in Geneva and works with the active input and support of its regional counterparts in all six WHO regions.

**GOe operational framework**

---

**GOe groups**  
**Target participants**

- **Universities**  
- **Private sector (e.g. IT orgs)**  
- **Public sector**  
- **NGOs**  
- **Professional bodies (e.g. IMIA)**  

- **All WHO staff including:**  
  - GOe  
  - Regional coordinators  
  - National coordinators

- **Experts in variety of areas relevant to eHealth**

- **Experts who have knowledge of eHealth, dedication, and influence at the national level to achieve the GOe goals**
Overall goals

The GOe is a global networked operation and its success is dependent on having access to information at the national and local level in all Member States. The first global survey was successfully conducted in 2005/2006 – 700 expert informants from 112 Member States participated. In order to enhance the Observatory’s capacity to deliver reliable and current information this network needs to be consolidated and expanded. Currently, the Observatory is running a concerted campaign to recruit additional institutions to form National Observatory Groups (NOGs) in each country. This will be mainly achieved through collaborating with international professional associations in eHealth, medical informatics and telemedicine.

The National Observatory Groups will:
- contribute to the development of the global survey instrument on eHealth;
- assist with in-country data collection and analysis using methodologies and instruments developed for use globally;
- convene and mobilize national stakeholders (such as those in the health, technology, telecommunications and education sectors) for data collection and analysis;
- collect and analyse additional country-specific data (determined by the needs of individual countries) in the context of the global eHealth survey;
- monitor and report trends which impact eHealth policy and practice in specific countries;
- promote the in-country use of findings from the GOe survey towards improved eHealth policy and practice; and
- provide information for other WHO-based eHealth initiatives on an ad hoc basis.

Thematic working groups are also being established in strategically important areas such as eHealth policy; proven eHealth practices, equity of access and multilingualism; eLearning; and Telehealth. These groups will evolve over time, and where possible, the GOe will collaborate with existing groups. In cases where there are no groups in existence in a particular thematic area, the GOe will convene them and seek suitable partners to carry them forward.
The first global survey on eHealth: perspectives from the European Region

Purpose

This report follows the recent worldwide eHealth survey, and the subsequent publication of the Observatory’s survey report Building foundations for eHealth: progress of Member States (3). It focuses on the information gathered from the European Region. The subsequent discussion will show this Region’s current eHealth situation, which will enable countries to compare their progress against others using identified regional and global statistical means as a benchmark. Through the use of such benchmarks, policy-makers in European countries will be able to advocate for further development in specific eHealth areas, thereby raising the standards of eHealth throughout the Region.

Reporting results

This report provides an analysis of the data from the participating countries from the European Region that responded to the eHealth survey. All tables referring to trends used the data from the 25 countries that responded by the time of survey closure (mid-August 2006). Calculations involving World Bank income groups are based on 26 countries as the results from one further country, whose response arrived after survey closure, could be incorporated in these later calculations. Areas of analysis include policy development, funding environments, infrastructure, capacity, eHealth for citizens and access to electronic information on the part of the public and health professionals. Full country data sets for all 26 countries, including country profiles, are available online.

A solid statistical complementary source of information to the GOe eHealth country profiles is provided in Connecting for health: global vision, local insight (5). Produced by WHO for the WSIS, this publication contains profiles of each Member State according to specific statistics on health, demographics and ICT, which provide a context in which investment in ICT for health can be better understood by all stakeholders.

Survey in brief

A detailed description of the first eHealth survey conducted by the Observatory can be found elsewhere (3). The seven survey themes of the global report are reported here with a specific focus on, and analysis of the WHO European Region. These themes are:

1. Enabling environment – policies and strategies
2. Infrastructure – access to ICT
3. Content – access to information and knowledge
4. Cultural and linguistic diversity, and cultural identity
5. Capacity – human resources knowledge and skills
6. National Centres for eHealth
7. eHealth systems and services – the needs of Member States

4  http://www.who.int/GOE.
5  http://www.itu.int/wsis/.
The methodology used for conducting the survey and the coordination between WHO Headquarters and the European Region followed the procedures that were conducted globally. Of importance was the liaison between the Regional office and WHO country offices and national counterparts. This is because the country offices were closest to the informants and were usually involved in arrangements for the focus groups. Several sections of the global eHealth survey report have been used here because they are relevant to the discussion of the European Region.

Countries were asked to attribute a score for each eHealth action ranging from not effective to unknown with the gradations in between of slightly, moderately, very and extremely effective. This rating system is based on the “perceived effectiveness” by the group rather than on evidence. Reference to scientific evaluation of programmes was not required. To simplify analysis and demonstrate trends more clearly, it was decided to aggregate these scores in the reporting of the results into three broader groups: (i) not and slightly effective; (ii) moderately effective; (iii) very and extremely effective.

The WHO Member States of the European Region have been grouped according to World Bank income groups, within the context of opportunities for eHealth.6

**Respondents**

The WHO European Region now comprises 53 countries with great geographical diversity and many cultures, religions and languages. It is home to some 870 million people – close to one fifth of the world’s population. GDP per capita varies enormously in the Region, from close to US$ 30 000 in Western European countries to some hundreds in the Central Asian Republics. Health care expenditure per capita increases manifold from the most eastern countries to those countries in the European Union. People born in western Europe can expect to live on average 10 years longer than those born in eastern Europe. Inter- and intra-country inequity in the Region is thus a serious issue. The economic differences run in parallel with ICT penetration and contribute to the ‘digital divide’.

**World Bank income group 1**

Countries in the high-income group have long established health delivery systems which are hard to change. Cross-border interoperability and change management are key problems to solve. These countries have national or regionally derived resources to spend on ICT for health.

**World Bank income group 2**

These countries are generally not bound to legacy health delivery systems and can therefore adopt new technologies more quickly. They are considered upper-middle income countries, and have a fair range of resources to spend on ICT for health. eHealth activities in this group of countries tend to support projects with national frameworks and are generally financed through international developmental organizations and sustained through national funds. By making ICT an integrated element of newly developed health delivery systems, countries can quickly expand (and improve) their health delivery services.

**World Bank income group 3**

These countries are distinguished by their scarcity of resources. Referred to as lower-middle income countries, their technological knowledge, however, is growing rapidly. For many the benefits of eHealth have not yet materialized and the rather uncoordinated eHealth developments tend to be supported projects financed and sustained through international developmental organizations with little national involvement. This often leads to a lack of continuity or sense of ‘ownership’ over the system(s) in place.

---

6 World Bank income groups are based on World Bank estimates of 2004 Gross National Income (GNI) per capita: (1) high income, US$ 10 066 or more; (2) upper-middle income US$ 3 256–US$ 10 065; (3) lower-middle income, US$ 826–US$ 3 255; and (4) low income, US$ 825 or less. (For more information see: http://www.worldbank.org.)
World Bank income group 4

None of the three countries in group 4, or low-income group, in the European Region responded to the survey. Reasons for this stem from a lack of capacity – these countries did not have eHealth professionals to respond to the survey. For consistency, this group has been included in the analytical figures with zero responses.

Response rate

A total of 26 countries (50% of the 52 WHO European Region Member States, representing approximately 64% of the Region’s population) responded to the survey. Responses by Member States to the global eHealth survey are the only data sources used as the basis for this report. Table 1 shows the distribution of the responding countries by WHO World Bank income group and Table 2 is a list of all WHO European Region Member States, by response to the survey and World Bank income group. At the time of the survey closure (mid-August 2006) the WHO European Region comprised 52 countries. This number rose to 53 on 29 August 2006 when Montenegro became a Member of WHO.

<table>
<thead>
<tr>
<th>World Bank income group</th>
<th>European Region Member States</th>
<th>High income</th>
<th>Upper-middle income</th>
<th>Lower-middle income</th>
<th>Low income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total no. of countries</td>
<td>52</td>
<td>25</td>
<td>11</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>No. of responding countries</td>
<td>26(^a)</td>
<td>13</td>
<td>10</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Response rate %</td>
<td>50(^a)</td>
<td>52</td>
<td>91</td>
<td>23</td>
<td>0</td>
</tr>
</tbody>
</table>

\(^a\) Calculations involving World Bank income groups are based on 26 countries as the results from one further country, whose response arrived after survey closure, could be incorporated in these later calculations.

Table 1. Response rate to the eHealth survey, by World Bank income group

Almost all of the upper-middle-income level countries responded to the survey. This is in contrast to a 50% response by this group globally. This should allow a relatively complete picture to emerge for this group of countries, which can be used to better plan for eHealth programmes. Highlighting common trends and needs of the European Region overall should also facilitate planning for future development. Unfortunately, the countries in the low-income category did not respond to the survey, so trend data for this group cannot be examined.

The responses of countries in both the lower-middle and lower-income groups (23% and 0%, respectively) were lower than the global response rates (45% and 65%, respectively). The high-income group response of 52% was on a par with the global response rate, which was 45%. As with the global results for this group, some of the more developed countries may have found the survey relatively elementary for their level of advancement in eHealth.

---

\(^a\) The WHO European Region comprised 52 countries at the time of survey closure (mid-August 2006).
The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

### Table 2. WHO European Member States by World Bank income group

<table>
<thead>
<tr>
<th>Country a</th>
<th>World Bank category b</th>
<th>Country a</th>
<th>World Bank category b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>3</td>
<td>Latvia</td>
<td>2</td>
</tr>
<tr>
<td>Andorra</td>
<td>1</td>
<td>Lithuania</td>
<td>2</td>
</tr>
<tr>
<td>Armenia</td>
<td>3</td>
<td>Luxembourg</td>
<td>1</td>
</tr>
<tr>
<td>Austria</td>
<td>1</td>
<td>Malta</td>
<td>1</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>3</td>
<td>Monaco</td>
<td>1</td>
</tr>
<tr>
<td>Belarus</td>
<td>3</td>
<td>Netherlands</td>
<td>1</td>
</tr>
<tr>
<td>Belgium</td>
<td>1</td>
<td>Norway</td>
<td>1</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>3</td>
<td>Poland</td>
<td>2</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>3</td>
<td>Portugal</td>
<td>1</td>
</tr>
<tr>
<td>Croatia</td>
<td>2</td>
<td>Republic of Moldova</td>
<td>4</td>
</tr>
<tr>
<td>Cyprus</td>
<td>1</td>
<td>Romania</td>
<td>3</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>2</td>
<td>Russian Federation</td>
<td>2</td>
</tr>
<tr>
<td>Denmark</td>
<td>1</td>
<td>San Marino</td>
<td>1</td>
</tr>
<tr>
<td>Estonia</td>
<td>2</td>
<td>Serbia and Montenegro</td>
<td>3</td>
</tr>
<tr>
<td>Finland</td>
<td>1</td>
<td>Slovakia</td>
<td>2</td>
</tr>
<tr>
<td>France*</td>
<td>1</td>
<td>Slovenia</td>
<td>1</td>
</tr>
<tr>
<td>Georgia</td>
<td>3</td>
<td>Spain</td>
<td>1</td>
</tr>
<tr>
<td>Germany</td>
<td>1</td>
<td>Sweden</td>
<td>1</td>
</tr>
<tr>
<td>Greece</td>
<td>1</td>
<td>Switzerland</td>
<td>1</td>
</tr>
<tr>
<td>Hungary</td>
<td>2</td>
<td>Tajikistan</td>
<td>4</td>
</tr>
<tr>
<td>Iceland</td>
<td>1</td>
<td>The Former Yugoslav Republic of Macedonia</td>
<td>3</td>
</tr>
<tr>
<td>Ireland</td>
<td>1</td>
<td>Turkey</td>
<td>2</td>
</tr>
<tr>
<td>Israel</td>
<td>1</td>
<td>Turkmenistan</td>
<td>3</td>
</tr>
<tr>
<td>Italy</td>
<td>1</td>
<td>Ukraine</td>
<td>3</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>3</td>
<td>United Kingdom</td>
<td>1</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>4</td>
<td>Uzbekistan</td>
<td>4</td>
</tr>
</tbody>
</table>

* List of WHO European Member States at the time of survey closure (mid-August 2006).

b. World Bank income groups are based on World Bank estimates of 2004 Gross National Income (GNI) per capita: (1) high income, US$ 10,066 or more; (2) upper-middle income US$ 3,256–US$ 10,065; (3) lower-middle income, US$ 826–US$ 3,255; and (4) low income, US$ 825 or less. These were the latest available data as at the time of analysis for Building foundations for eHealth: progress of Member States (3).

* Not included in the general analysis.

**Bold** Indicates survey respondents.
Building Foundations for eHealth in Europe
Discussion of the findings

Introduction

Because many European national health-care industries are publicly owned, the operational efficiency of this sector can have a strong impact on the national budget. The use of ICT in the health-care sector can streamline the administration of health-care organizations, improve delivery of clinical services and increase the reach of public health education for its citizens.

The implementation of successful eHealth systems at the national level is dependent on a framework of strategic plans and policies being put in place (creating a foundation of eHealth development). Such e-strategies can unite rival and divergent views by involving all stakeholders in a common project and focus energy and resources into key development objectives. These plans and policies should be legislated in such a way as to enable eHealth applications and services which are useful, accessible, private and confidential to all citizens, regardless of culture, language or location.

The eHealth Development Model (Figure 3) is a structured framework adapted by the Global Observatory for eHealth, in which to consider and report the survey results.

![Figure 3. eHealth Development Model](source: Building foundations for eHealth: progress of Member States (3))
1. **Foundation policies and strategies** form the basis of national eHealth development. They deal with infrastructure, funding, policy and governance of eHealth development. eHealth strategic planning in Europe is a complex affair involving a multitude of municipalities, regions, nations, the EU, WHO and other strategic partners.

2. **Enabling policies and strategies** deal with the important issues of the human elements vital to successful eHealth developments and implementation such as capacity building, interoperability issues, multiculturalism and cultural diversity (ensuring equal access for all), and citizen protection (security of information and equity).

3. **eHealth applications** deal with provider services, knowledge services, and public services. The successful adoption of eHealth applications depends on the quality of foundation and enabling policies and strategies. The range of eHealth applications is extensive. Applications that have the greatest positive impacts should be chosen according to the utilization of scarce resources.

The discussion will continue by assessing each of these three areas in detail, specifically from the perspective of the European Region.

## Foundation policies and strategies

A significant component of the survey was dedicated to measuring progress made by countries in establishing basic mechanisms that play a critical role in the development of eHealth at the national level. These include establishing methods for transparent and responsive eHealth governance, strategic policies and funding approaches supporting eHealth and promoting infrastructure development.

### Governance

Governance is part of the foundation of eHealth. The need for sound governance practices has been gaining increased recognition in recent years with the push in many countries for responsible, participatory and equitable public-sector management. In reality, governance mechanisms are not always established in advance of initiatives themselves. This appears to be the situation in many countries within the European Region with respect to eHealth governance.

Effective health care governance requires:
- accountability of officials – they must be answerable for government decisions and actions;
- participation of society (in both consultation and planning);
- equitable and consistent policy and legislation relating to health; and
- transparency of information on policies, regulations and decisions to all stakeholders and the general public.

### Key trends

- Responding countries in the European Region have a higher average compared to the global rate of national eHealth task forces responsible for providing advice and guidance on eHealth issues.
- The rate of eGovernance adoption for countries in the high-income group in the European Region is also higher than that same group at the global level.
- None of the responding countries from the low- or lower-middle income groups have a national eHealth task force.
To determine if countries had introduced governance mechanisms in eHealth, survey respondents were asked if their country had a national eHealth task force or advisory board to provide advice in areas such as policy/strategy or programme development and evaluation. In contrast to the majority of the questions in the survey, countries were not asked to “rate the effectiveness” of these bodies or about “future plans”, but instead to respond with “yes/no” and provide any relevant details (3). Responses can be seen in Figure 4.

In many European countries, concerted efforts at governance have been under way for some years, under the umbrella term of ‘eGovernment’. This field covers all activities relating to the use of ICT by governments. It includes both an agency’s activities with regard to citizens, businesses and other public agencies, as well as activities concerning internal administration processes, structures and behaviour.8

One approach to eGovernment is through the provision of Web portals whereby citizens can access government information and services including those for health. Services such as medical invoicing, and making available patients’ laboratory results to medical institutions often leads to faster and more personalized care. In turn, this allows citizens and organizations to use their time more efficiently – they are no longer waiting in line for face-to-face service. Much work has been done and a lot more is needed. The main issue for the European Region is interoperability within and between organizations and governmental institutions. If this is not achieved, it will lead to an extra administrative barrier rather than deliver the promise of eHealth through eGovernance.9

The implementation of effective eHealth systems and services hinges on the successful collaboration of multiple stakeholders with a diverse range of interests and agendas. It is therefore critical that governments establish sound governance mechanisms to manage the complex process of collaboration, which will lead to successful implementation of eHealth systems and services. The survey results indicate that there is considerable work to be done in this area, both in the European Region and globally, as many countries still do not have governance mechanisms in place.

---


Policy framework

Three interrelated policy/strategy areas were surveyed, and they are listed below. For the purpose of this report, the terms ‘policy’ and ‘strategy’ are used interchangeably; the survey questions did not ask respondents to differentiate between whether they had introduced a policy or a strategy. The intent was to ascertain if action had been taken in a particular area.

- **National information policy** – a framework and approach governing a wide range of aspects regarding national information (in digital and analogue form). Issues covered can include quality of information, access, legal deposit, intellectual property, freedom of information, data protection and privacy. Such policies or strategies aim to be comprehensive and cover multiple sectors.

- **National ePolicy** – The framework required to incorporate ICT in governance is an ePolicy. It is established by government with the intent of advancing the use of ICT. ePolicies are multisectoral and cover the use of ICT in such areas as education, welfare, commerce, communications, health and other sectors.

- **National eHealth policy** – A country eHealth policy is focused specifically on achieving health goals. In the GOe survey it referred specifically to the use of ICT in the health sector.

### Key trends

- The European Region has a very high rate of national information policy adoption (96%); only one country indicated not having such a policy at the time of the survey.
- The Region has a higher rate of ePolicy adoption than is the case globally for all three forms of policy queried (national information policy, national ePolicy and national eHealth policy).
- All responding countries planned to have national information policies by the year 2008 with 96% planning to have national ePolicies and 85% with plans for eHealth policies.

Table 3 provides a profile of the European Region and global trends in policy adoption across the three frameworks as well as projections for adoption levels by 2008. The results show a clear trend in policy adoption rates; the most fully adopted being national information policies followed by national ePolicies and eHealth policies. This trend is influenced by at least two factors. Firstly, information policies have a broader scope than the other frameworks and are generally introduced first by governments. Secondly, eHealth is still in its infancy in many countries, particularly developing countries, so specific eHealth policy development is likely to be lagging behind the broader information and ePolicy frameworks.

<table>
<thead>
<tr>
<th></th>
<th>National information policy</th>
<th>National ePolicy</th>
<th>National eHealth policy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>European Region</strong></td>
<td>96%</td>
<td>88%</td>
<td>73%</td>
</tr>
<tr>
<td><strong>Global</strong></td>
<td>78%</td>
<td>76%</td>
<td>63%</td>
</tr>
</tbody>
</table>

Table 3. Trends in policy adoption in the European Region and globally
National information policy

Countries in the European Region have a very high rate of national information policy adoption (96%); only one country indicated not having such a policy at the time of the global survey. Globally fewer responding countries (78%) have such a policy currently in place.

Countries in the European Region rated their policy effectiveness generally as moderate. Only six countries rated their policies as being very effective. All countries except one, which is undecided, expected to continue with their national information policy. Six countries planned to revise their policies by 2008. Figures 5–7 show the adoption of various policies in the European Region and globally, by World Bank income grouping.

National ePolicy or strategy

A country eHealth policy is focused on achieving health goals through the use of ICT. In this survey it refers to the use of ICT specifically in the health sector. In the European Region, 88% of responding countries currently have an ePolicy instrument in place to promote the use of ICT across all sectors (Figure 6). Three countries reported not having such a policy; and two of these countries planned to introduce one over the coming years. Over half these countries rated their ePolicies as only moderately effective; only six countries rated them as being very or extremely effective.
National eHealth policy or strategy

A country eHealth policy is focused specifically on achieving health goals. In this survey it refers specifically to the use of ICT in the health sector.

Just over 70% of responding countries in the European Region have an eHealth policy or strategy, about 10% higher than the global rate of eHealth policy adoption. Of the countries that do not, half planned to implement one by 2008 (Figure 7). Box 1 illustrates Turkey’s road to eHealth policy adoption. Box 2 highlights steps the European Union have taken.

The information regarding eHealth policy adoption based on World Bank income groups in the European Region differs slightly from the global trend. A higher percentage of countries in the upper-middle income groups have such a policy compared to those in the high-income group.

Box 1. Steps to eHealth policy adoption in Turkey

---

Discussion

Seeing the need for a more coordinated and integrated health care system, Turkey’s Ministry of Health implemented the National Health Information System project in January 2003. Ten working groups comprising members from governmental institutions, the private sector, nongovernmental organizations (NGOs), universities and social partners conducted inter alia an assessment of the technological situation within their respective fields.

The eHealth Working Group, coordinated by the Ministry of Health and developed in the context of ‘eTransformation Turkey’, has developed modules of eHealth services. The eHealth Project Proposal, prepared by the Health Transformation Programme and eTransformation Turkey has been accepted by the International Telecommunication Union (ITU). As a further step the eHealth Implementation Plan has been developed.

Source: Building foundations for eHealth: progress of Member States (3).
i2010 Subgroup on eHealth

The European Union currently includes 27 of the 53 countries in the WHO European Region. Each country is responsible, however, for its own health care system and related policy developments. The development of eHealth policies and strategies is challenging, and providing a common platform for policy-makers to meet, share and advance is one way to assist Member States in this challenge.

In June of 2005, the European Commission shifted focus from the eEurope 2005 initiative to the i2010 initiative. It launched the i2010 subgroup on eHealth, an advisory group of nominated Member States representatives, based on the former eHealth Working Group.

The objectives of the subgroup are twofold: to develop a European eHealth service and information space that leads to improved quality and access to care while enabling cost-effectiveness of eHealth systems and services, stimulating European industry, and supporting European patient mobility; and to facilitate and contribute to the implementation of the European eHealth Action Plan (by 2010) including eHealth actions plans in each of the Member States and European Economic Area countries.

The members of the subgroup include decision-makers and leaders in the definition and implementation of national eHealth initiatives in each Member State. They are complemented by stakeholders in national Telecommunications ministries. Other complementary organizations involved include health authority associations, industrial associations, health professional representatives, and user groups involving patients and citizens — represented in an associated eHealth Stakeholders’ Group.

In 2006, the second year of activity, all Member States prepared their eHealth strategies and action plans, often closely linked with the development of relevant information societies within countries. These plans are being developed and implemented in different organizational health, medical and telecommunications contexts, which often include close partnerships between the public and private sector. By the end of 2006, a compilation was made of all the available Member States’ plans and roadmaps, the good practice in the development of country’s eHealth action plans, and in the field of eHealth more generally.

Source: Adapted, with permission, from: http://ec.europa.eu/information_society/activities/health/policy_action_plan/i2010subgroup/index_en.htm#Background_history

Box 2. Supporting policy-makers in building eHealth Policies: eHealth in the European Union

Conclusion

These three policy areas set the foundations for appropriate development and handling of data and information, in particular, digital information. These policies are multisectoral and usually contain components relative (although not specific) to the health sector. As eHealth policies are the most specialized within this framework they generally follow the introduction of the broader policies. Examples from Turkey and the European Union illustrate the point that most governments now see the need to shape the development and management of the eHealth domain through eHealth policies, which make transparent the regulations and laws related to data and information in the health sector.

Compared to other WHO regions, the European Region has a relatively high adoption rate of eHealth policies enabled partly through the facilitation of the European Commission and related eHealth Action plan (6). However there still remains a need for substantial policy action, particularly in the countries from the lower-middle and low-income groups.

To support Member States in their efforts to shape eHealth policy, the Global Observatory for eHealth will establish a thematic working group to develop a set of tools and guidelines for adaptation by countries on proven practice in eHealth policy development and evaluation.
Funding approaches

Critical to foundation actions in national eHealth capability is the development of a funding framework to support the national eHealth vision. An adequate funding environment is important in ensuring that eHealth policies and action plans can be carried out in a sustainable way.

The following approaches to funding were explored in the survey:

- **Public funding** – providing ongoing public funding for ICT support of programmes addressing national health priorities.
- **Private funding** – securing private funding, through grants or private investments, for ICT support of programmes addressing national health priorities.
- **Public-private partnerships** – partnerships formed between public organizations and private entities to foster the use of ICT in the health sector.
- **Procurement policy** – guidelines and procedures developed by institutions or governments to guide software, hardware and content acquisition in the health sector.

**Key trends**

- Public funding in this Region remains the primary means of support for eHealth activities (81%). This is a higher level than the global average (68%).
- The European Region reported the highest adoption of policies related to securing private funding through grants or private investment for ICT support to programmes addressing national health priorities (50%) compared to other regions.
- The European Region lags behind the global average in terms of forming public-private partnerships to foster the use of ICT within the health sector.
- Over half of the responding countries in the Region (54%) indicated that procurement policies are in place.

Table 4 shows a comparison of funding approaches in the European Region and globally.

<table>
<thead>
<tr>
<th></th>
<th>Public funding</th>
<th>Private funding</th>
<th>Public-private partnerships</th>
<th>Procurement policy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>European Region</strong></td>
<td>81%</td>
<td>91%</td>
<td>50%</td>
<td>58%</td>
</tr>
<tr>
<td><strong>Global</strong></td>
<td>68%</td>
<td>79%</td>
<td>37%</td>
<td>49%</td>
</tr>
</tbody>
</table>

Table 4. Trends in funding approaches in the European Region and globally
Public funding for ICT support

Public funding remains the primary means of support for eHealth activities with 81% of responding countries in the European Region providing ongoing public funding for ICT support to programmes that address national health priorities (see Figure 8). The few countries that do not benefit from public funding for ICT support cut across the three World Bank income groups represented in the survey.

The majority of countries (62%) rated their public funding programmes moderately effective or better. Three countries consider their public funding to be only slightly effective, one country has an unknown rating, and five countries did not respond to this question.

Of the four countries that do not have public funding mechanisms in place, two indicated that they would introduce them by 2008 and the other two were undecided.

![Figure 8. Public funding mechanisms in the European Region and globally, by World Bank income group](image)

Private funding

Compared to all other WHO regions, responding countries from the European Region reported the highest adoption rate (50%) of securing private funding (through grants or private investment) for ICT support to programmes addressing national health priorities. Of these, five countries rated their private funding approach to be very effective. Three countries rated it as moderately effective, three as only slightly effective and two countries did not know. Of those countries that do have a private funding mechanism in place, two countries were undecided as to whether to continue with this approach or not.

Within World Bank income groups for the Region, the highest proportion of private funding is found among the lower-middle income group (67% – Figure 9). This is the opposite of the global trend, which shows this group having the lowest rate of private funding (28%). The lower-middle income groups are likely to have received substantial funding from development banks and agencies as well as the European Union, which could account for increased private funding sources.

![Figure 9. Private funding in the European Region and globally, by World Bank income group](image)
Public-private partnerships

eHealth is well suited to public-private partnerships (7). As the ICT industry is primarily driven by the private sector, the industry can offer significant value including technical expertise, equipment, training, project management and financial support to any partnerships involving the technology required for eHealth.

Eleven countries (42%) within the European Region reported having established public-private partnerships (Figure 10). This is lower than the global average (54%). Over half of these countries view their partnerships as very or extremely effective. Three countries reported their programmes moderately effective. One country reported it to be only slightly effective and one country did not know the effectiveness of this partnership.

Figure 10. Public-private partnerships in the European Region and globally, by World Bank income group
Procurement policies

Procurement policies can influence costs dramatically as they influence how resources are allocated for eHealth systems and services over time. They affect resource allocation, purchasing and business processes at all levels. Only slightly more than half the countries (54%) reported having a procurement policy in place to guide software, hardware and content acquisition in the health sector. This is nearly the same as the global average of 50%.

A low potential purchasing power of ICT goods and services (such as evidenced by countries in the lower-income group) is in fact the best reason for developing a sound procurement mechanism. With such procurement policies, the purchasing power of these countries could rise. Relying too heavily on donor supply of ICT reduces the ability (and interest) of countries to develop their own ICT. The dramatic projected growth in procurement policies globally attests to the fact that the financial importance of a sound procurement policy is becoming recognized.

Of the countries that responded, fourteen (54%) had a procurement policy in place (Figure 11). Seven countries rated them as very or extremely effective, five rated them as moderately effective, one as only slightly effective; and one stated that the policy’s effectiveness is unknown. Five countries indicated that they would start a procurement policy by 2008 and five countries were undecided in their future course of action.

Among the countries reporting from the Region, there are higher rates of those from the upper-middle and lower-middle income groups with procurement policies in place than the trend found globally.

![Figure 11. Procurement policies in the European Region and globally, by World Bank income group](image)

Conclusion

Public funding continues to be by far the most common source of financing for ICT in the health sector in the European Region. Evidence-based project successes and examples of best practices in this area should be articulated and encouraged.

The importance of public-private partnerships is clearly beginning to be recognized. However, care needs to be taken with these partnerships to ensure the social good. Legal agreements are required to clearly lay out expectations and obligations for both sides of the partnership.

The Global Observatory for eHealth will develop a worldwide database of eHealth proven practices to help promote public-private partnerships and support the process of eHealth initiatives’ application for funding from both governments and donors.
Infrastructure

Infrastructure refers to the connectivity, the hardware and software required to deliver and process digital content. As eHealth systems and services cannot exist without a technical infrastructure for their creation and delivery, it has been classified as one of the key foundation actions in the eHealth Development Model.

Three complementary measures were surveyed to ascertain national approaches used to build infrastructure for the health sector to support the development of eHealth systems and services.

- **Intersectoral and nongovernmental cooperation** – Working with NGOs and other sectors, such as the businesses, aid agencies or other bodies, to promote infrastructure development.
- **National ICT in health development plan** – A plan or ‘roadmap’ for the national deployment and development of ICT infrastructure, services and systems in the health sector.
- **Affordability policy** – Implementing a national policy to reduce the costs of ICT infrastructure for the health sector, for example of computer equipment, software, Internet or communications.

Using these three categories as a guide, the following discussion will highlight the state of infrastructure development in the European Region. Table 5 shows the overall trends in the Region, as well as globally.

### Key trends

- The European Region is on par in intersectoral and NGO cooperation adoption with the global average. This is not expected to grow (unlike in much of the developing world) as countries in the Region tend to cooperate more with the private sector, rather than rely on NGOs for example.
- The European Region has a slightly lower rate of national eHealth ICT planning than globally among countries in the high- and upper-middle income brackets. Adoption is slightly higher among countries in the lower-middle income group.
- The European Region also has a lower than average rate of adoption of affordability policies among countries in the high-income group. This trend is opposite, however, in countries in the upper-middle income group.

<table>
<thead>
<tr>
<th></th>
<th>Intersectoral and nongovernmental cooperation</th>
<th>National plan for the development of ICT in health</th>
<th>Affordability policy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>European Region</strong></td>
<td>77%</td>
<td>77%</td>
<td>60%</td>
</tr>
<tr>
<td><strong>Global</strong></td>
<td>72%</td>
<td>80%</td>
<td>56%</td>
</tr>
</tbody>
</table>

Table 5. Trends in approaches to infrastructure development in the European Region and globally
Intersectoral and nongovernmental cooperation

Intersectoral and nongovernmental cooperation within the European Region is quite high (77%). Globally, it is the most widespread approach for building infrastructure for eHealth (Table 5). Unlike much of the developing world, this type of cooperation in the European Region tends to be with the private sector rather than NGOs and aid agencies.

The data by World Bank income group shows that cooperation is generally a little higher than the global averages except for the lower-middle income group, where it is slightly lower (Figure 12).

National plan for the development of ICT in health

A national ICT for health development plan is a relatively new and important approach for eHealth development. Historically eHealth has simply emerged in conjunction with technology rather than been planned to evolve with it. The European Region generally has a slightly lower rate of national planning in the upper- and upper-middle income groups compared to the global trend, and is slightly higher than the global average in the lower-middle income level (Figure 13).

Development plan ‘roadmaps’ are rapidly gaining recognition and acceptance as an integral part of the process of infrastructure building. This is reflected in the substantial rise from a current adoption rate of 60% to an expected rate of 80% by 2008 (Table 5). This represents a commitment to sound design of systems, and establishment of eHealth infrastructural integration, which is vital for cost savings, standardization and portability of information flows.
Affordability policy

An affordability policy aims to reduce and control the costs of ICT infrastructure. Currently such policies have a low rate of adoption globally, but substantial growth is expected by 2008. This may be explained by the fact that affordability policies are comparatively new and not yet well tested, but their perceived value is increasing. If developed and administered correctly they contribute towards maximizing savings on purchases, which in turn results in stretching the buying power of fixed budgets.

Despite the value of such a policy, only eight countries responding from the European Region (35%) reported having an affordability policy. Moreover, only four of these countries rated their policies as very effective or better; the rest found them to be only moderately to slightly effective. The adoption of such policies is shown in Figure 14. The data show however that the European Region plans to improve the rate of adoption of affordability policies to almost 60% by 2008. This shows an increasing awareness on the part of countries of the need to maximize ICT budgets for health care.

![Figure 14. Affordability policy in the European Region and globally, by World Bank income group](image)

Conclusion

Implementation of national plans for the development of ICT in health and the introduction of affordability policies are two actions within the area of infrastructure development that hold the promise of significant growth in the future.

National plans for ICT development in health represent a sound approach to the systematic design, establishment and integration of infrastructure for eHealth. Member States forecast a great deal of growth in this area – recognition by governments of its benefits. The adoption of affordability policies for infrastructure is expected to increase even more as governments begin to realize financial and technical gains.
Enabling policies and strategies

Enabling policies and strategies that facilitate eHealth developments are the bridges between foundation actions such as good (eHealth) governance, developing a sound policy framework, funding and infrastructure and the provision of effective and responsive eHealth services. These strategies focus on the protection of citizen data and confidentiality, promote equity of access throughout society, and promote multilingualism and cultural diversity in cyberspace. They also facilitate the development of eHealth standards to ensure diverse systems can communicate with each other, and build human resources capacity so that health professionals are well trained in the use of the many eHealth applications.

Citizen protection

The newness of eHealth and the potential for its establishment into health care systems leaves many people uneasy about the privacy and confidentiality of their personal health information. Media reports of high profile computer security breaches in the corporate world undermine public confidence in the security of their private health records through misuse by parties which have illegally gained access to them.

Governments and health-care organizations will invest billions of euros in eHealth systems in the years ahead. There are numerous eHealth systems vendors manufacturing and selling electronic health record (EHR) systems, hospital information systems (HIS) and medical devices, not to mention the numerous networking and communications software and hardware providers. Though each of these vendors is committed to delivering secure solutions it is critical that every effort be made to ensure the integrity and confidentiality of these applications, through, for example, legislation.

Key trends

- The European Region reported the highest rate of implementing citizen protection policies and strategies (77%) relative to the other WHO regions across the globe.
- The rate of implementing standards, regulations or legislation to protect the privacy and security of patient data is relatively high for countries in the high- and upper-middle income groups, but very low for those in the lower-middle income group.

Table 6 shows the growth in citizen protection policies from 2005 to 2008. Of the responding countries in the European Region, twenty have taken action, nine of which indicated that their systems were very or extremely effective. Seven countries thought them moderately effective, and two found them to be only slightly effective. A further two countries did not know their effectiveness.

<table>
<thead>
<tr>
<th>Policies to protect patient data</th>
<th>2005</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Region</td>
<td>75%</td>
<td>88%</td>
</tr>
<tr>
<td>Global</td>
<td>51%</td>
<td>78%</td>
</tr>
</tbody>
</table>

Table 6. Trends in adoption of citizen protection policies in the European Region and globally
Figure 15 shows the adoption of policies on data protection, on the part of countries in the European Region as well as globally. The trend shows that the poorer the country, the less likely the country will have a policy on data protection. Boxes 3 and 4 illustrate the experiences from the European Union and the United Kingdom of Great Britain and Northern Ireland.

Ensuring the security of information is a challenge for both users and suppliers. Lack of confidence in existing solutions has hindered implementation of health informatics applications and the effective use of the Internet. The ‘always-on’ feature of broadband can increase the vulnerability of networks and of the information transmitted on them. Fully interactive applications, needed for public services, require an adequate level of confidence in areas such as identity management, e-payment and patients’ rights.

The main eHealth security threats are summarized as follows:
- unauthorized access to and modification of (confidential) information;
- incorrect identification of the source/origin of medical information transmitted via the Internet;
- loss of data and exposure of personal information;
- alteration of medical records, even by authorized medical personnel and/or institutions (e.g. for remote diagnostics and medical advice);
- insufficient security (encryption) of transmitted health information between medical institutions; and
- an insecure communications and processing infrastructure (i.e. vulnerable to hackers).

The eEurope 2005 Action Plan of the European Commission recommends action on security by introducing policies for improving networks and information systems, e-Authentication through smart cards, privacy directives, citizens’ rights, international trade, industrial policy and law enforcement. Through the electronic signatures directive and the data protection legislation for electronic communication, the EU aims to reduce security and privacy concerns for a wide range of services and to ensure accurate operations.


Box 3. Challenges of information security, and measures to protect citizens in the European Union
Equity

Equity is recognized as a core value of health development. It is determined by policies to promote inclusive and equitable access to eHealth services to all groups within a nation. Within and between countries inequalities exist. The digital divide refers to inequalities in access to, and use of information and communication technologies. It can result from many factors such as geography, economics, age, gender, education, ICT skills and language (2). Human, ethical, and legal rights issues are also involved, in particular the right to the highest attainable standard of health. Efforts are needed to tackle the undue burden of ill-health borne by vulnerable and marginalized groups. This involves investment in development of infrastructure for ICT for health.

Key trends

- The adoption of equity policies in the European Region is slightly higher than the global average.
- Of those countries which have established equity policies, the majority consider them to be extremely to moderately effective.
- This is expected to grow to grow to almost 70% of responding countries by 2008.

One of the most significant challenges in the United Kingdom has been securing public and professional confidence in the information governance arrangements and privacy and confidentiality measures around holding and processing sensitive health information electronically.

This has been dealt with through extensive consultation with the public and health professionals, and maintaining transparent policies regarding the use of health data. A framework for information governance has been established, developed in full consultation with health-care professionals (arising out of the Caldicott review, all National Health Service bodies have senior clinicians appointed to oversee the confidentiality of patient data). The national programme for ICT infrastructure is being implemented with rigorous security measures including the use of smart cards for health-care professionals and mechanisms for patients to define what information they wish to be shared, and under what circumstances.

Source: Building foundations for eHealth: progress of Member States (3).

Box 4. Protecting the citizen’s information: the approach taken by the United Kingdom
The findings from the survey indicate that equity issues for eHealth have yet to be adequately addressed. The rate of adoption of equity policies is considerably lower than that of citizen protection. Within the European Region 52% of responding countries implemented policies to promote inclusiveness and equitable access to eHealth irrespective of culture, education, language, geographical location, physical and mental ability, age and gender (Table 7). Figure 16 shows the trends in policy adoption in the European Region and globally.

<table>
<thead>
<tr>
<th>Policies to promote equitable access to eHealth</th>
<th>2005</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Region</td>
<td>52%</td>
<td>78%</td>
</tr>
<tr>
<td>Global</td>
<td>44%</td>
<td>78%</td>
</tr>
</tbody>
</table>

Table 7. Trends in adoption of equity policies in the European Region and globally

The rate of adoption of equity policies is considerably lower than that of citizen protection. Within the European Region 52% of responding countries implemented policies to promote inclusiveness and equitable access to eHealth irrespective of culture, education, language, geographical location, physical and mental ability, age and gender (Table 7). Figure 16 shows the trends in policy adoption in the European Region and globally.

<table>
<thead>
<tr>
<th>European Region</th>
<th>52%</th>
<th>78%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global</td>
<td>44%</td>
<td>78%</td>
</tr>
</tbody>
</table>

Table 7. Trends in adoption of equity policies in the European Region and globally

Fifteen of the responding countries in the European Region have implemented an equity policy. Of those countries, seven rated them as very to extremely effective, four as moderately effective, one as only slightly effective, and three asserted that the effectiveness of their policies at this stage were unknown. By 2008 six countries planned to revise their policies, four countries planned to implement an equity policy for the first time, and seven countries had not decided on a course of action.

**Conclusion**

Though the European Region shows a much higher rate of adoption of citizen protection policies than is the case globally, much more work in this area is needed in the lower-middle income countries, where a low adoption rate for citizen data and information protection mechanisms may leave these countries vulnerable to security breaches.

One of the promises made by eHealth is to make health care more equitable, but there is a considerable threat that eHealth will actually deepen the digital divide. People who do not have resources and technological skills cannot access technology effectively. As a result, these ‘have-not’ populations – who would have the most to gain from eHealth – are those who are the least likely to benefit from advances in ICT. Political will and effective implementation of policies, therefore, are required to fulfil the promise of equitable access for all.
Multilingualism and cultural diversity

Multilingualism and cultural diversity refers to the respect for, and promotion of linguistic diversity, cultural identity, traditions and religions within cultures.\textsuperscript{10}

Language is the most direct expression of culture; it is what makes us human and what gives each of us a sense of identity (8). The EU Charter of Human Rights prohibits discrimination based on a number of grounds, including language.

Multilingualism refers to both a person’s ability to use several languages and the co-existence of different language communities in one geographical area. Policies in this area promote a society that respects all citizens’ linguistic identities and well-being.

Three complementary multilingualism and cultural diversity actions were assessed:

- **Policies on multilingualism and cultural diversity** – implementing policies or strategies that promote both the availability of information in local languages and that recognize cultural diversity.
- **Multilingual projects** – introducing special projects to promote the development and use of new electronic health content in multiple languages.
- **Translation and cultural adaptation** – supporting the translation and cultural adaptation (localization) of existing high-quality content created either locally or abroad.

### Key trends

- The European Region is slightly lower than the global average with regard to having policies to promote the creation of multilingual health content. Even among high-income countries implementation of such policies is low.
- Introducing special projects to promote the development and use of new electronic content in multiple languages is less prevalent in Europe than globally.
- Ten responding countries in Europe (41%) support the translation and cultural adaptation (localization) of existing high-quality content. This is above the global average.

Table 8 shows that not only have relatively few of the responding countries developed multilingual/multicultural policies, but they do not appear to be having the desired outcome of stimulating the development of multilingual health content. This means that many citizens may be unable to access eHealth resources due to language barriers.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Multilingualism and cultural diversity policy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>European Region</td>
<td>42%</td>
<td>52%</td>
<td>32%</td>
<td>47%</td>
<td>41%</td>
<td>46%</td>
</tr>
<tr>
<td>Global</td>
<td>50%</td>
<td>62%</td>
<td>22%</td>
<td>36%</td>
<td>31%</td>
<td>42%</td>
</tr>
</tbody>
</table>

Table 8. Trends in multilingual policies and projects in the European Region and globally

\textsuperscript{10} From Glossary at: http://www.who.int/goe/data/Global_eHealth_Survey-Glossary-ENGLISH.pdf.
Only 42% of the responding countries in the Region had adopted policies in 2005 (Table 8). In late 2005, the European Commission introduced a strategy to promote multilingualism, which should help to address the lack of such policies in countries within the European Union (8). One of the aims of the strategy is to encourage language learning and promoting linguistic diversity in society. While countries in the European Region projected an incremental growth over the next few years, this is likely to increase once the EU multilingualism strategy takes effect.

Of the twelve countries that have implemented multilingualism and cultural diversity policies, four rated them as very effective, three rated them moderately effective, three as only slightly effective, and two did not know the effectiveness of these policies.

A large proportion of countries (10) in the Region are undecided as to their future direction in this domain. Two countries responded to the survey they would adopt such a policy by 2008, and five planned to revise their current policies.

With regard to the World Bank income groupings, a trend in the European Region becomes apparent: there is a relationship between World Bank income groups and the likelihood of countries having introduced these policies. That is, the higher the income group, the more likely it is that a country will have a multilingual policy in place. Figure 17 shows the adoption of multilingualism policies in the European Region.
Multilingual projects

The introduction of special projects to promote the development and use of new eHealth content in multiple languages is the definition of multilingual projects, and was the second query in the survey. Unlike the scenario of policy development described previously, which is less resource intensive, developing original multicultural health content is labour intensive, requires specialist skills and is expensive, thus limiting some countries’ activities in this field. Figure 18 shows data for this indicator. An example of providing online access to health content in multiple languages is shown in Box 5.

Due to its labour-intensive nature, only eight countries in the Region have introduced special projects to promote the development and use of new health content in multiple languages. Three countries rated their projects as very effective, two as moderately effective and one as only slightly effective. Two countries were unable to rate their projects’ effectiveness.

In the short-term (by 2008) six countries planned to continue with their projects, two planned to revise theirs before continuing, three planned to start such projects and a large number of countries (13) were undecided on this question.

The European Region ranks lower than the global figures for introducing projects to promote the development and use of new eHealth content in multiple languages.

![Figure 18. Multilingual eHealth content in the European Region and globally, by World Bank income group](image)
Translation and cultural adaptation

The third query, about translation and cultural adaptation of content, is the process of translating and adapting information products to suit the language and cultural needs of groups, populations or countries. This process may be easier and faster than producing original content; specialist skills, however, are still required for translations and multicultural adaptation. In the European Region, this approach is less utilized than the development of original content. This is in contrast to the global trend, which shows a marginally higher adoption of translation and adaptation of content.

Ten countries in the European Region (41%) supported the translation and cultural adaptation (localization) of existing high-quality content (created either locally or abroad) (Table 8).

Only two countries rated this approach as very effective; four countries rated it moderately effective, two only slightly effective and two did not know. Despite not rating them very effective, three of five responding countries planned to continue with this approach; three others planned to make revisions; and only one country planned to start such a programme by 2008. The majority of responses (13) were undecided (or did not respond to this question). These data would suggest there is a lack of a consensus on this issue in the European Region.

There appears to be no clear relationship between World Bank income group and this action. Countries in the high-income group in the European Region rank lower than those globally in supporting localization of existing high-quality content, but those in the upper-middle income bracket rank higher (Figure 19).

Conclusion

Multilingualism and cultural diversity is the least developed area of any examined in the survey. Not only do less than half of responding countries across the European Region have multilingual/multicultural policies, but the projected figures indicate limited growth. This is an area where the translation of policy into action seems problematic.

These issues, which directly affect citizen access to information, are not high on the current agenda of many governments. If this trend continues, many citizens may continue to be excluded from eHealth services due to language barriers. The lack of access to digital information by cultural and ethnic groups within nations contributes directly to fragmentation and inequality of access to resources, enhancing the digital divide within countries.
Interoperability is used to describe systems and services that are connected and can work together seamlessly and effectively, while maintaining patient and professional confidentiality, privacy and security (9).

Interoperability of health systems and services is a major challenge for individual Member States and for health sector actors. It has the potential, however, to help resolve a number of pressing issues facing Europe’s health-care systems and services, namely those of integrated services where information must flow through all levels of the health system.

It requires concerted action (cooperation) and coordination at various levels to be successful, ranging from the local to the global, with an important component coming from technical experts. Examples include the exchange of messages between various health-care facilities and their numerous applications; electronic health records (EHRs); patient identifiers; coding terminology; clinical guidelines and documentation; and business processes of health care institutions.

As the term implies, interoperability is involved in all aspects of eHealth. Standards are the spine of interoperability, and the development of common standards requires input and collaboration from both the technical and political points of view.

Standards allow for interoperability between health system operations within an institution, a region, a country and internationally. The greater the standardization, the greater the freedom of choice a user has when working within a particular system.

Additionally, standards have a strong impact on eHealth financing. When governments establish standards, the transaction costs between systems drop considerably, therefore the process of transferring data and information between systems becomes more economical.

For the purpose of this survey, eHealth standards were defined as technical specifications developed by multiple stakeholders through a consensus approach to promote interoperability among systems for the deployment of eHealth applications (3).

Key trends

- The European Region has a high overall number of countries adopting norms and standards for eHealth systems, services or applications.
- Countries in the high- and upper-middle income groups appear more likely to adopt eHealth standards than lower-middle countries.
- It appears that by 2008 all responding countries will have adopted standards for eHealth.

12 Also see: http://www.esa.int/telemedicine-alliance.
Figure 20 shows the European Region’s adoption of eHealth standards by World Bank income group and the global figures for comparison. The uptake of such standards in the European Region is much more advanced than the global average. All responding countries predicted they would have implemented policies on standards by 2008.

Twenty-one countries in the European Region have adopted norms and standards for eHealth systems, services or applications. Eighteen rated their standardization as moderately to extremely effective, one as only slightly effective, and two were undecided. Five countries did not respond to this question.

Thirteen countries planned to continue without change over the next two years, nine planned to revise their policies, and four planned to introduce standards by 2008.

To foster an environment of cooperation on eHealth interoperability, WHO has built partnerships with ITU, the European Commission and the European Space Agency, as well as individual Member States. The Telemedicine Alliance\(^14\) has drawn up strategic recommendations for interoperability of eHealth applications across the countries of Europe (see Box 6)\(^10\). Box 7 shows an example from Norway.

---

\(^{14}\) http://www.esa.int/esaMI/Telemedicine_Alliance/index.html

\(^{15}\) See also: http://ec.europa.eu/information_society/activities/health/docs/projects/fp6book/tma-bridge.pdf
The two projects of the Telemedicine Alliance were implemented during 2003–2005. Funded by the EU, the Telemedicine Alliance involved three partners: the World Health Organization Regional Office for Europe, the European Space Agency (ESA) and the International Telecommunication Union.

The objective of the first phase (2003–2004) was to develop a roadmap for the selection, implementation and use of eHealth services for the year 2010. The ultimate goal is to improve access, quality and reduce costs of health service provision, that is, to try to formulate an overlying policy for the application of telemedicine in support of, primarily, the European citizen by the year 2010. The results of Phase I pointed to the critical importance of establishing a solid basis of standards and interoperability, from which to proceed. The lack of adequate technical standards and medical coding systems was identified as being a major obstacle in the implementation of telemedicine and eHealth. A booklet with the project results has been published by ESA, entitled Telemedicine 2010: visions for a personal medical network. (BR-229).

The second phase of the Telemedicine Alliance ran from 2004 to 2005. Titled A bridge to the use of eHealth in 2010, it made concrete recommendations and proposals on how to support the interoperability in the EU Member States. The recommendations were drafted based on the consensus of the International eHealth Interoperability Workshop, held in Barcelona in June 2005. The strategic plan and its recommendations are intended for the European Commission and the EU Member States but are equally relevant for all stakeholders. They consist of the following.

1. Ensure delivery of transnational health services are efficient, high quality and accessible by all European Union citizens.
2. Create an environment where eHealth is an integral part of health services across the European Union.
3. Ensure that the European system of transnational health services is adaptive to changing demography and other major impacts.
4. Ensure that proven (good) practice is shared both in terms of eHealth infrastructure and in terms of transnational health services.
5. Ensure that transnational eHealth and ICT-supported health services put the citizen at the centre of health care.
6. Ensure that all supporting actions are in conformity with the explicitly expressed political objectives of the European Union, such as European directives, the Lisbon Declaration, eEurope, the Nice Declaration, etc.
7. Provide guidelines to countries so that they can ensure that their national and regional strategies support the implementation of transnational health services.
8. Ensure that the strategy builds on the strengths found in Europe (the EU), both in health care and its supporting industries and infrastructures.

Achievement of these objectives would benefit citizens, public health institutions, health care workers and insurers, and increase citizen mobility. It will also support pan-European research, the development of European industry and a European market, and the planning for a European response to epidemics. A booklet containing the project’s conclusions has been published.

It should be noted that the European Commission’s new i2010 initiative aims to answer the challenge posed by the renewed Lisbon Declaration, while incorporating the eEurope 2005 Action Plan. One pillar of the strategy is to implement a comprehensive strategy for ICT across the EU.

* See http://www.esa.int/inspanda/ori/br/br229/br229.pdf.
** http://www.esa.int/SPECIALS/Telemedicine_Alliance/SEM0PESY3EE_0.html.
*** http://esamultimedia.esa.int/docs/TMA-Final-Brochure.pdf.

Box 6. Citizen-centred eHealth in Europe by the year 2010
Conclusion

As the examples in Boxes 6 and 7 show, sustainable interoperability within and between European health systems is becoming a reality. Standards will ultimately facilitate transnational eHealth services across Europe through the achievement of actual and sustainable interoperability within and between European health systems.

To aid further in this venture, WHO will collect and collate information with a view to establishing national standardized health information systems that can easily and effectively exchange information among Member States. Member States are being encouraged to participate in multisectoral efforts to determine evidence-based eHealth norms and standards in collaboration with WHO.

The North Norwegian Health Net was signed as being one of Norway’s most effective actions taken to build an enabling environment for the use of ICT in the health sector. It is a comprehensive scheme to connect all health-care institutions in the area to a national computer network. Services available include telemedicine, email and Internet access. A general practitioner has responsibility for ensuring that the clinical information is correct. Medical departments are responsible for the content of their own Web pages. All institutions require authorization before connection to ensure data protection and security. Changes in communication between primary- and secondary-care sectors are being monitored. To date the implementation of the network programme has gone smoothly.


Box 7. Progress in eHealth: the steps Norway has taken
Capacity building

Increasingly, health professionals (in practice and in training) need to develop ICT competencies to ensure they can maximize the benefits from the technological solutions becoming available through eHealth. Once the foundation policies and strategies have been established to cultivate eHealth, the workforce must be trained to use the eHealth applications being developed and deployed.

Two capacity building measures were surveyed:

- **ICT training for health sciences students** - offering ICT skills courses as part of university curricula (undergraduate or postgraduate) for health sciences students.
- **Continuing education in ICT** - providing ICT skills programmes in the ongoing training of health professionals.

**Key trends**

- Almost all responding countries in the European Region are already working toward strengthening ICT capacity of health-care professionals and students through undergraduate or postgraduate training.
- It is anticipated that there will be growth in the uptake of ICT continuing education in the near future, though barriers to this for lower-income countries still exist.
- eLearning is expected to gain further acceptance as a legitimate method of learning as ICT infrastructure develops worldwide, and especially in rural areas.

Table 9 shows trends in capacity-building in the European Region and globally. A large proportion of countries have adopted initiatives in these two areas.

<table>
<thead>
<tr>
<th></th>
<th>ICT training for health sciences students</th>
<th>Continuing education in ICT</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Region</td>
<td>80%</td>
<td>89%</td>
</tr>
<tr>
<td>Global</td>
<td>70%</td>
<td>80%</td>
</tr>
</tbody>
</table>

Table 9. Trends in ICT capacity-building in the European Region and globally

**Undergraduate or postgraduate training on ICT**

In the European Region, particularly, a very high number of countries now offer courses in ICT training at their universities (23 countries, 89%). Nine of these countries rated their programmes as very or extremely effective, nine rated theirs as moderately effective, two as only slightly effective, and two responded their effectiveness was unknown. One country did not respond to this question.

Thirteen countries planned on continuing their programmes over the next two years, eight countries planned to continue following revisions, one country planned to stop their programme, and three were undecided. Again, one country did not respond to this question.
Figure 21 shows the levels at which the European Region has adopted such curricula. It is interesting to note that all responding countries in the upper-middle and lower-middle income groups have introduced ICT training initiatives. Clearly, these countries have recognized the need to develop ICT competencies among their populations. Continuing education in these topics will ensure that countries can maximize the benefits of eHealth.

Continuing education on ICT

The survey also assessed the existence of continuing education programmes. These refer to non-traditional classroom training. Programmes involving distance learning (such as ‘low-residency’ graduate programmes) have blossomed as the use of the Internet has grown. The survey sought to determine the role this non-traditional training took among countries, specifically in the ICT field. A well-developed continuing education sector allows graduates to upgrade their skills and keep abreast of developments in a continuously changing field. Box 8 highlights the creation of a virtual learning centre designed to build and strengthen the capacity of health professionals.

In the European Region, 75% of responding countries provide ICT skills programmes in the ongoing training of health professionals compared with the global average of 70% (Table 9).

Of those countries offering continuous non-traditional education programmes, five rated theirs as very effective, seven as moderately effective, six as only slightly effective; and one rated the programmes effectiveness as unknown. Ten countries planned to continue with their continuing education programmes without change, eight countries planned to revise them, three planned to start them for the first time, and four were undecided.
While countries in the high- and upper-middle income groups have widespread adoption of the non-conventional training programmes, not so for countries in the lower-income group (Figure 22). Possible reasons for this include lack of access to sources of development aid funding; this was the case for lower-income countries in other WHO regions.

![Figure 22. Continuing ICT education of health professionals in the European Region and globally, by World Bank income group](image)

Professional training in health informatics

Another emerging area in eHealth is the increasing recognition of the need for qualified health informatics specialists. Undergraduate and postgraduate programmes in health informatics, which aim to produce highly skilled professionals to bridge the fields of computer systems and health, are already being established, and more will need to follow as demand increases. Although the survey did not focus on these specialist education programmes, the need to build capacity at this level is evident, given how often it was mentioned by responding countries in the European Region.

Well before the introduction of other such courses, the school of Health Information Science of the University of Victoria, British Columbia, Canada, pioneered training for this profession in 1982, and continues as a leader in terms of curriculum and practical application of health informatics. More recently, the Yorkshire Centre for Health Informatics (YCHI) of the University of Leeds in the United Kingdom has also launched courses in health informatics, specifically in preparation for the National Health System (NHS) information strategy “Information for Health”. The YCHI was developed by partners from the NHS, industry and academia and provides evidence-based education and training through a variety of highly specialized courses.

Every country could use more personnel with ICT skills in the health-care sector. It was one of the most frequently cited problems from responding countries, and is a significant barrier to eHealth implementation. This shortage is two-fold: a lack of ICT specialists in the health sector and a shortage of health sector specialists with ICT knowledge. ‘ICT education’ for health professionals must go far beyond basic computer training to include informatics, Internet technologies, concepts in networking and communication, as well as security basics.

16 [http://hinf.uvic.ca/](http://hinf.uvic.ca/)
17 [http://www.ychi.leeds.ac.uk/ychi/aboutus.aspx](http://www.ychi.leeds.ac.uk/ychi/aboutus.aspx)
eHealth applications

The first two tiers of the eHealth Development Model (Figure 3) need to be well developed to ensure that the third and final tier, eHealth applications, delivers reliable and high quality services. It is these services that will ultimately shape how eHealth is used and perceived by citizens, health practitioners and policy-makers.

This section examines developments in three broad areas of eHealth applications including:
- **Public services** - information services provided to the citizen, usually via the Internet.
- **Knowledge services** - electronic information and education services aimed at health-care professionals in training and practice.
- **Provider services** - eHealth tools and services used in the provision of health care to citizens.

### Key trends

- All but one of the responding countries in the European Region reported that they create and provide health information to the general public in electronic format.
- Great efforts are being made within the Region to provide online health-related materials for the general public and health professionals.
- The European Region has one of the highest rates of access to international electronic journals compared to other regions.
- Trends indicate that the Region plans to continue to increase provision of knowledge services in the future.

### Public services

Public services cover health information provided to the general public in electronic format and include the creation and delivery of content such as government services to citizens, NGO or other health agency outputs and distributions to libraries, community centres, public kiosks as well as private citizen access from homes.

Figure 23 shows the very high level of uptake in the provision of health information services for the general public for the European Region.
Europe has continued to lead globally in disseminating e-Health information to the public with all but one country reporting they create and provide health information for the public in electronic format.

These public services were considered very or extremely effective by eight countries, moderately effective by nine and only slightly effective by three countries. Five countries were undecided about the status of their public services.

Fifteen countries planned to continue to provide this service and nine countries planned to revise it in the short-term (by 2008).

As technology evolves, citizens continue to expect more from their ICT. And as expectations grow, the providers and creators behind the technology respond to offer more evolved products to meet that demand. The trend is to enhance transparency and quality by content providers (see Box 8 for an example). This is especially true in countries in the high- and upper-middle income groups. Because of the global nature of the World Wide Web and the global spread of ICT, countries in the lower-middle and low-income countries are predicted to follow this trend in the future.

---

The Health and Consumer Protection Directorate-General recently launched the Health-EU Portal (the official public health portal of the European Union). The main objective of this portal is to provide European citizens with easy access to comprehensive information on public health initiatives and programmes within the EU. It is intended to help meet EU objectives in the public health field (e.g. the i2010 initiative) and promote the steady improvement of public health in EU Member States.

The Health-EU Portal is directed at those who want to keep informed about issues affecting their health, and at those who wish to keep up to date with policies and decisions made at European, national and international levels (e.g. health professionals, administrators, policy-makers and stakeholders). It contains a wide range of information and data on health-related issues and activities, for both health experts and the public (for the former, the Portal provides access to statistical databases relevant to public health). It is accessible to everyone with access to the Internet.

The target audience of the Portal is the EU citizen. An initiative of the Community Public Health Programme 2003–2008, the Portal will permit greater involvement of individuals, institutions, associations, organizations and bodies in the health sector by facilitating consultation and participation. The EU population — indeed every population — has the right to receive simple, clear and scientifically sound information about measures to protect health and prevent diseases. The citizen is not a passive player in this information exchange. Rather she or he shares the responsibility for improving her or his health. Increased awareness of the different EU activities and programmes relating to public health will help the general public contribute to, and support them.

Access to the information needed is possible via a simple theme structure which presents health-related aspects affecting individuals and their environment. Each theme leads to its related sub-themes — for example My Lifestyle leads to Nutrition — where there is a comprehensive range of information and links to policies and activities in the European Union. National policies on each topic can be found in the section dedicated to Member States. Information on contributions to the development of public health issues by European NGOs and international organizations is also included in a dedicated section. Links lead the reader directly to the page on the subject required.

The sections on News, major topical Events occurring across Europe and Press Releases provide the opportunity for people to keep up to date and stay abreast of major decisions and events in the health field at national, regional and international levels.

The Portal also makes available Legislative acts adopted by community institutions, and EU Publications in order to provide easy access to the objectives of the European Union and the means it employs to attain them.

Source: Adapted, with permission, from: http://ec.europa.eu/health-eu/about_en.htm.

Box 8. Provision of online health information to the general public: the Health-EU Portal
Conclusion
The European Region is relatively advanced in making efforts to enhance the accessibility, quality and reliability of health information content. That being said, governments and content providers need to become more aware of international resources that assist health-content owners with guidelines on quality assurance. By familiarizing themselves with such organizations, governments can form partnerships with them and incorporate these best practices into the development of their own information products.

Knowledge services
The survey assessed country provision of national and international electronic journal services to medical and allied health practitioners, scientific researchers, academics and students in health sciences. Additionally, country progress was investigated in the development of national digital open archives services in biomedical and health research.

Three information services were assessed in the survey:
1. **International electronic journals** - peer reviewed journals published in electronic format by international publishers (either online or as a CD-ROM).
2. **National electronic journals** - peer reviewed journals published in electronic format within a country.
3. **National open archives** - usually initiated at the national level by academic institutions, special interest groups or governments. The operational model is one in which authors deposit their works in digital format (before or after publication) in one or more repositories that then make the works available to readers around the world, usually at no cost.

International electronic journals
The survey’s first query in this area related to access to international electronic journals. These are peer-reviewed journals published in electronic format by international publishers (online or as CD-ROM); such journals have the most widespread distribution. The first international eJournal services were developed in the late 1980s by European and American commercial enterprises as well as government bodies. These services were extremely expensive owing to telecommunications charges and were out of the reach of academic institutions in the developing world and many developed countries as well. Pricing models were eventually re-evaluated and together with the advent of the CD-ROM, radical changes began to occur.

By the year 2000, eJournals were being collectively pooled, and for highly discounted prices (and even no cost) access was granted to the academic communities of the developing world. Two notable enterprises were the Soros foundation’s Open Society Institute (which launched the Electronic Information for Libraries, eIFL; see Box 10) and WHO (the Health InterNetwork Access to Research Initiative, HINARI).

In the European Region, 22 countries (84%) reported providing online access to international journals in biomedicine and social sciences for the medical and research communities (Table 10).

<table>
<thead>
<tr>
<th></th>
<th>International electronic Journals</th>
<th>National electronic journals</th>
<th>National open archives</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Region</td>
<td>84%</td>
<td>89%</td>
<td>65%</td>
</tr>
<tr>
<td>Global</td>
<td>72%</td>
<td>82%</td>
<td>51%</td>
</tr>
</tbody>
</table>

Table 10. Trends in provision of online access to research in the European Region and globally

18 See: http://www.hon.ch/Project/ for quality of health information issues as well as guidelines. eHealth in action examples: online health information for the general public in the European Region. Also see http://www.who.int/ghl/en/.
19 http://www.eifl.net/epis/sections/home.
Of those providing access 11 consider their programmes to be very or extremely effective, six countries think them to be moderately effective, two only slightly effective, and two responded the programmes effectiveness was unknown.

Sixteen countries planned to continue providing access over the next couple of years, four countries planned to revise before continuing, one country planned to start providing access, and four were undecided. Figure 24 shows the trends of adoption of the programmes by World Bank income grouping.
National electronic journals

The second query in the survey had to do with national electronic journals. Reports of national studies on trends and developments in health care, particularly in developing countries, are often not published in international journals or cited in citation indexes, and hence not available to health professionals or researchers outside of a particular country. This question assessed whether such national studies were being digitized and made available online.

It was found that 17 reporting countries in the Region (65%) provide online access to their own country’s national literature in biomedical and social sciences for the medical and research communities.

Nine of these countries indicated that the service has been very or extremely effective, five countries thought theirs moderately effective, two countries only slightly effective, and one country did not rate the programme’s effectiveness.

Thirteen countries planned to continue with these services, four countries planned to revise and continue, one country planned to start providing access and six countries were undecided. Figure 25 shows the trend in adoption by World Bank income group.

![Figure 25. Provision of national electronic journals in the European Region and globally, by World Bank income group](http://www.openarchives.org/; also see: http://www.openarchives.org/tools/tools.html and http://www.soros.org/openaccess/).

National open archives

Lastly, the survey queried countries on their provision of national open archives. Collection and provision of such archives is a relatively new phenomenon, though one country in the European Region reports beginning as early as 1993. The approach is based on the promotion of interoperability standards to facilitate the efficient dissemination of content. Any institution can gain free access to the vast range of over thirty open-source software packages used for the creation and maintenance of archival scholarly materials. The Open Archive Initiative (OAI) is the main body for this potentially revolutionary approach to the digital storage and dissemination of scholarly publications. Although the OAI does not necessarily promote the principle that all publications should be free, it does strongly support the need for open access through interoperability.

The most significant advances in promoting open and free access are being seen in France, Germany, the Netherlands, the United Kingdom and the United States of America, and it will not be long before many more countries in the European Region follow.

In the European Region, 16 countries have implemented a policy or strategy for a digital national open archive or repository for scientific research, including health research. Of these, four countries indicated that their policy or strategy was very effective, four countries thought them moderately effective, six countries only slightly effective, and one country stated the effectiveness was unknown.
Twelve countries planned to continue with their open archives, three planned to continue with revisions, three planned to start initiatives, and seven countries were undecided as to their short-term future plans in this area. Figure 26 shows the provision of these programmes in the European Region, by World Bank income group.

In general, developing countries are less advanced in this field than industrialized ones. This is not unexpected as industrialized countries were the first to advocate for open archives and are already well advanced in the field of scholarly publishing. All countries are likely to reap significant rewards by developing open archives, especially those with limited financial and publishing resources. As the amount of (no cost) information continues to grow through open archives sources and the quality of content is assured, it is highly likely that this publishing approach will soon compete against that provided by commercial scientific and medical publishers, namely international and national eJournals. An example of access to online health content is illustrated in Box 9. Box 10 highlights Slovakia’s journey in providing health related digital content.

Health Sciences Online is a site where health professionals in training and practice can access comprehensive, up-to-date high-quality courses, references and other learning resources to improve their knowledge.

Health sciences information and training are vital for the health and socioeconomic development of a nation, but learning resources are inaccessible for many health professionals for a variety of reasons. In recent years, information and communication technologies, particularly the Internet, have been central to remedying this situation (e.g. by offering distance learning courses). However, there are still significant challenges to accessing online content, such as verifying that curricula offered online are up-to-date and legitimate.

Several organizations are collaborating to create a virtual learning centre to provide comprehensive education and training for health professionals, including Web-accessible health sciences courses; reference libraries with textbooks, databases, and journals; and collaboration spaces for person-to-person interaction.

The site will be a portal with browse and search engine functions providing free online linkages to a comprehensive collection of high-quality courses and references in medicine, public health, nursing, and other health sciences disciplines. These materials will be donated, hosted, and maintained by distinguished content partners, so health professionals around the world can access free, up-to-date courses through this portal.

Founding collaborators for this site are the American College of Preventive Medicine, United States Centers for Disease Control and Prevention, the University of British Columbia, the World Bank and WHO. This effort already has extensive courseware and references committed from founding collaborators and other organizations, as well as universities such as Cornell, Emory, Harvard, Johns Hopkins, and the Massachusetts Institute of Technology. Funding has come from WHO and the Ulrich and Ruth Frank Foundation for International Health, among others; more is being sought.

For more information go to the pilot web site at http://hso.info/.

Box 9. Building the capacity of health professionals
Fortunately, the model of costly subscriptions to access to medical research is now mostly in the past due to global collaborative efforts in consortium-style licensing initiatives between governments, international organizations, aid agencies and the private sector.

The birth of the open archives movement offers worldwide access to online health research, giving everyone access to health research without financial restriction. WHO Member States are encouraged to evaluate the benefits of creating open archives for health sciences literature as a cost-effective way of producing, disseminating and accessing national and international research literature.

**eLearning in health sciences**

Well-planned and strategic use of eLearning can greatly increase access to education for poor and/or isolated populations, which in turn can lead to improved health care in such populations – for example leading to more health professionals in rural areas.

**Key trends**

- eLearning in the health sciences among countries in the European Region has grown rapidly since 2000, though adoption in countries of the lower-middle income group lags far behind.
- Countries in the European Region display a higher rate of provision of these courses (62%) than the global average (50%); uptake in the Region is expected to grow to 80% by 2008.

The first reported eLearning initiative for health in Europe was in 1987. Development was slow until 2000 when eLearning in the health sciences began to grow rapidly, with over half of the European Region incorporating eLearning as a health sciences teaching method. However, countries in the World Bank’s lower-middle income group lag substantially behind those in the higher-income groupings (Figure 27). eLearning is a resource-intensive initiative – that is, effective production and delivery of courses requires a well-developed infrastructure. However, most eLearning initiatives targeted at lower-income countries are based on using resources developed in more resource-rich environments, which are then adapted for use locally.

Sixteen countries from the European Region (62%) reported that they offered health sciences courses through eLearning for health professionals in training and practice.

Three of these countries reported that their programmes are very satisfactory, seven countries reported moderate satisfaction, two countries rated them as only slightly effective, one country thought its programme was ineffective and three countries did not know.

Nine countries planned to continue with their eLearning programmes in the next two years, six countries planned to continue with revisions, five planned to start such programmes and five countries were undecided.

---

**Box 10. Access to eHealth content by health professionals and students in Slovakia**

The national medical bibliography, Bibliographia Medica Slovaca, provides professionals with online access to health content. Alongside, a number of health-related web sites established by health institutions within Slovakia have been created. Additionally, efforts have also led to several health-related web sites for the public. A consortium of Slovak libraries has also been created (project eIFL) to provide access to medical databases at affordable rates.

Source: Global eHealth Survey 2005 (WHO/GOe)
Conclusion

eLearning is a rapidly growing field within e-Health. Its use in the education and training of students and professionals of the health sciences makes possible cost-effective delivery of courses to large numbers of people throughout the world. For example, developing countries are progressively adopting such learning techniques as a way of redressing the critical shortage of health professionals in their countries.
Provision of tools and services

Published in 2006, *eHealth tools & services: needs of the Member States* discusses the theme of tools and services in great detail. It summarizes the needs of WHO Member States and their expectations from the WHO Secretariat. The figures for the European Region are presented here.

Most of the global survey was concerned with the degree of uptake of eHealth actions by countries. Questions under this rubric aimed to identify, however, which eHealth tools and services countries wished to have assistance with, in the form of support from WHO and its partners. It did not attempt to identify the level of introduction or adoption of these services in countries, or the successes and challenges in the use of various tools. This would need to be the focus of further detailed study.

Key trends

- European Member States would welcome generic eHealth tools primarily in the areas of decision support systems, national drug registries, national electronic registries and Telehealth.
- European Member States would welcome the active involvement of WHO to provide services primarily in the areas of information on effective/best eHealth practices, Information on trends and developments in eHealth, as well as advice on methods for monitoring and evaluating eHealth services.

Figure 28 shows the responses of European Region Member States to a question about usefulness of WHO-provided generic prototypes (for adaptation to a local context) on various eHealth tools.
Responding Member States indicated that generic eHealth tools from WHO would be most useful in the areas of decision support systems (DSS), national drug registries, and national electronic registries and Telehealth.

Moderately useful generic eHealth tools include directories of professionals & institutions, Geographical Information Systems and patient information systems. And finally the provision by WHO of generic eHealth tools for electronic health records, hospital information systems, and general practitioner information systems appeared to be less useful in the Region.

Figure 29 illustrates the responses of Member States to a question on the usefulness of eHealth services required from WHO.

![Graph of eHealth services considered useful by Member States in the European Region]

Responding Member States indicated that eHealth services from WHO would be most useful in the areas of Information on effective/best eHealth practices, information on trends and developments in eHealth, and advice on methods for monitoring and evaluation of eHealth services.

Moderately useful eHealth services would include advice on eHealth norms and standards, advice on eLearning programmes and on human resources development. Advice on eHealth policy and strategy, and on national needs assessment for eHealth appeared to be the least requested topics among countries in the Region.

The eHealth tools and services report provided evidence and guidance for the proposal for work in the area of eHealth made to the WHO Executive Board in December 2005 (8). This document outlines the work to be done globally and by WHO Region.
References


ANNEX

eHEALTH COUNTRY PROFILES

EUROPE

This Annex has been copied from Building foundations for eHealth: progress of Member States. See, http://www.who.int/GOe
Explanatory notes

This annex presents eHealth country profiles of the 112 responding Member States listed by WHO region. Due to the lay-out of this document, additional information provided by the Member States, could not be included in these profiles but is available on the GOe website: http://www.who.int/GOE.

The text and tables in this annex present information on the status of eHealth in WHO Member States collected between mid-2005 and mid-2006. It is reported across six eHealth themes:

- Enabling environment: policies and strategies to support the information society (Annex: Figures 1);
- Infrastructure: access to information and communication technologies (Annex: Figures 2);
- Cultural and linguistic diversity, and cultural identity (Annex: Figures 3);
- Content: access to information and knowledge (Annex: Figures 4);
- Capacity: human resources and skills (Annex: Figures 5);
- eHealth tools and services (Annex: Figures 6 and 7).

Each theme briefly describes the highlights of the figures, the successes and challenges, and other pertinent information presented by the survey respondents.

Quality assurance

A range of concrete measures were taken to assure the quality of the country profiles. Initially, the quality assurance of the survey process (see chapter: First global survey on eHealth). The country profiles were created on the basis of the survey information to provide a “snapshot” of the status of eHealth in WHO Member States (August 2005–August 2006). Member States were invited to validate the country profiles prior to publication and changes requested were incorporated where possible. Twenty percent of the responding countries requested minor changes. All data were double checked before entry and after lay-out for publication. The questionnaire can be found on the GOe web site.

Limitations

As text was used from the surveys, significant editing as well as interpretation of incomplete text, bullet points, and notes was often necessary. In other cases, countries provided lengthy explanations of success stories or barriers to implementation of policies or other actions which had to be condensed for publication purposes. This means that in some cases information was omitted from the hard copy. To provide ready access, the GOe will publish the full data set on its website, including the individual country profiles for downloading.

Country indicators

The following socio-economic indicators were selected for each country to complement the country profile information: population, GDP per capita, total health expenditure, OECD status, World Bank income group, ICT diffusion index, main telephone lines, Internet users, and mobile phone subscribers.

---

4 Country grouping by OECD and non-OECD membership. For more information, see: http://www.oecd.org.
Examples

The following are a sample of three typical figures to be found in the country profiles with descriptions as to how they should be interpreted.

Figures 1, 2, 3, 4 and 5

- **A national eHealth policy or strategy** was introduced in 2001. It has been extremely effective and will be continued (C).
- **Public funding** was provided between 1999 and 2002. It was slightly effective and future action is yet to be decided (U).
- **Norms and standards for eHealth systems** were adopted in 2004. Their effectiveness is so far unknown but the action will be continued (C).
- **Standards to protect the privacy of patient data** have not yet been implemented but will start over the next few years (S).
- **Policies to promote equitable access to eHealth** were implemented and have been very effective and the action will be reviewed and continued (RC).

Figure 6 eHealth tools

Electronic Health Records (eHR) are considered extremely useful if WHO could offer generic prototypes for adaptation. Patient Information Systems (PIS) moderately useful, Hospital Information Systems (HIS) not useful, General Practitioner Information Systems (GPIS) very useful and no data was available for national electronic registries.

Figure 7 eHealth services

Advice on national needs assessments for eHealth is considered an extremely useful eHealth service, advice on eHealth policy and strategy moderately useful, advice on methods for monitoring and evaluation (M&E) of eHealth services not useful, information on effective/best eHealth practices very useful, advice on eHealth norms and standards slightly useful, and no data was available for information on trends and developments in eHealth.

Legend

A legend is provided to assist in the interpretation of the figures:

- perceived effectiveness of action—indicated by a shade of blue or grey
- future action to be taken—expressed by a letter at the end of the bar
- date range of action—years shown on the x axis, date range indicated by start-and end-point of bar
- usefulness—for Figures 6 and 7, ranging from 0–5 to report a country’s perceived usefulness of selected eHealth tools and services
Enabling environment — policies and strategies to support the information society

Albania reports that more than half of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken. The country predicts these actions will be reviewed and continued over the next few years. National mechanisms such as an information policy, an eStrategy, and an eHealth policy have been established between 2001 and 2004 to promote the use of ICT in health, and intersectoral and nongovernmental cooperation. The former, which sets targets for health sector connectivity, was implemented in 1999 and is reported to be moderately effective. The latter has been very effective and the partnerships will continue. The development of a reporting system for morbidity statistics in primary health care in two districts of Albania is rated as the most effective action taken so far in building ICT infrastructure for the health sector.

Future action

- National information policy or strategy
- National ePolicy or eStrategy
- National eHealth policy or strategy
- Procurement policies or strategies
- Public funding
- Private funding
- Public-private partnerships
- eHealth standards
- Citizen protection
- Multilingualism and cultural diversity
- Equity

Year

< 95 96 97 98 99 00 01 02 03 04 05 06 >

C C C S C C S C U C C S S U

Figure 1. Enabling environment for ICT in the health sector: actions taken or planned within 2 years and their effectiveness rating

C C C S C C S S U C C S S U

Figure 2. ICT infrastructure development for the health sector: actions taken or planned within 2 years and their effectiveness rating

C C C S C C S S U

Figure 3. Electronic multicultural health content: actions taken or planned within 2 years and their effectiveness rating

C C C S C C S S U

Figure 4. Cultural and linguistic diversity, and cultural identity

To date, none of the specified actions to promote the development of electronic multicultural health content have been implemented and a decision remains to be made as to which actions will be taken.
Online access to health content has been provided in Albania since 2005 through electronic health information for the general public. An effectiveness rating of this action is not yet available. Access to national and international electronic journals will be introduced by 2008. Albania highlights the completion of its Ministry of Health’s web site as the most effective action taken to promote access to electronic health content.

ICT capacity in Albania has been built through the use of undergraduate and postgraduate training in ICT. ICT skills courses as part of the university curricula for health sciences students have been offered since 1996 and they are rated as very effective. ICT skills programmes in the ongoing training of health-care professionals will be provided by 2008, as well as health sciences courses through eLearning for health professionals in training and practice.

Electronic Health Records (eHR), Patient Information Systems (PIS), Geographical Information Systems (GIS) and Decision Support Systems (DSS) are rated as extremely useful if the World Health Organization could offer these as generic prototypes for adaptation by Albania. Advice on eHealth norms and standards is considered an extremely useful eHealth service.
Enabling environment – policies and strategies to support the information society

Armenia reports that more than half of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken. They will be reviewed and continued over the next two years. The government plans to adopt norms and standards for eHealth systems, services or applications by 2008. Public funding for ICT support to programmes addressing national health priorities has been provided since 1998. That same year public-private partnerships to foster the use of ICT within the health sector were formed. Both these actions have been rated as very effective. The most significant challenges in developing an enabling environment for the use of ICT in the health sector have been the lack of an integrated policy on eHealth, and inadequate levels of managerial, material and technical services.

Infrastructure – access to information and communication technologies

Since 2002, Armenia has been working effectively with other sectors and nongovernmental partners to promote infrastructure development and will continue to do so. It has also implemented a national plan for the development of ICT in health, which has successfully set targets for health sector connectivity. The absence of policies is the most significant challenge in building infrastructure for the health sector.

Cultural and linguistic diversity, and cultural identity

To date, none of the specified actions to promote the development of electronic multicultural health content have been implemented and a decision remains to be made as to which actions will be taken.
Content – access to information and knowledge

Access to national and international electronic journals was introduced over the past few years and is rated to be slightly to moderately effective. Since 2004 health information for the general public has been available in electronic format. Highlighted as very effective is the training provided on medical information and statistics. The development of web sites on medical informatics is noted as being one of the most effective actions taken to promote access to electronic health content for health professionals. The most significant challenge in this field is the stability of Internet links due to the high costs associated with their provision and maintenance.

Capacity – human resources knowledge and skills

Armenia has been offering training in ICT as well as eLearning programmes in health sciences over the past few years. These programmes are rated as moderately effective and will continue over the next two years. Training courses are also offered to ICT specialists in preparation for projects funded by donors, including preparing a methodology for medical statistics and training in collection, processing and presentation of electronic information. Some of the most effective actions reported include: the examination and approval of reporting media; introduction of the International Classification of Diseases and Related Health Problems (ICD) 10th edition; introduction of new reporting forms; and development of special teaching modules. The poor coordination of activities in this area is reported to have been a significant challenge.

eHealth tools and eHealth services

National electronic registries, National drug registries, Directories of health-care professionals and institutions, and Geographical Information Systems (GIS) are rated as very useful if the World Health Organization (WHO) could offer these as generic prototypes in preparation for projects funded by donors, including preparing a methodology for medical statistics and training in collection, processing and presentation of electronic information. Some of the most effective actions reported include: the examination and approval of reporting media; introduction of the International Classification of Diseases and Related Health Problems (ICD) 10th edition; introduction of new reporting forms; and development of special teaching modules. The poor coordination of activities in this area is reported to have been a significant challenge.

For more information see Explanatory notes. For electronic version see http://www.who.int/GOe
Austria reports that the majority of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken and are rated from slightly to moderately effective. They will be continued over the next two years. The implementation of procurement policies or strategies to guide software, hardware and content acquisition in the health sector will be started by 2008. Regulations to protect the privacy and security of individual patient data where eHealth is used (introduced in 2000) have been extremely effective. The most effective actions in this area have been the creation of guidelines for communication between health-care providers (MAGDA-LENA) in 1997 and the introduction of the eCard programme in 2005. The implementation of standards for content, including terminology and technical standards, presents the most significant challenge in this area.

**Infrastructure – access to information and communication technologies**

Austria indicates that it works effectively with nongovernmental partners to promote infrastructure development, and will continue to do so. It also plans to implement a national ICT in health development plan by 2008, which will set targets for health sector connectivity. Pilot projects for communications between hospitals and other health-care providers have been successfully undertaken. The most significant challenge in building health sector infrastructure is the lack of integration across this sector.

**Cultural and linguistic diversity, and cultural identity**

To date, none of the specified actions to promote the development of electronic multicultural health content have been implemented and a decision remains to be made as to which actions will be taken.
Content – access to information and knowledge

Access to international electronic journals was introduced in 1998. This service has been extremely effective and will be continued. Creating health information and providing it electronically for the general public started in 1995 and is rated as very effective. Austria highlights a health information system for citizens (established in 1995) as its most effective action taken to promote access to electronic health content. Finding sponsors for the development of patient-related health knowledge and quality assurance of health-related Internet pages are reported as the most significant challenges.

Capacity – human resources knowledge and skills

All actions listed to build ICT capacity in the health sector began in 2003. They are rated as slightly to moderately effective and will continue over the next two years. The introduction of ICT (electronic journals – PubMed, virtual universities) within the medical curricula is one of the most effective actions reported. A significant challenge has been the hesitation of medical doctors to use ICT.

eHealth tools and eHealth services

Electronic Health Records (eHR), Patient Information Systems (PIS) and directories of health-care professionals and institutions are rated as extremely useful if the World Health Organization could offer these as generic prototypes for adaptation. All other listed eHealth tools are considered moderately to very useful.
Belarus reports that slightly fewer than half of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken, and they are rated from moderately to very effective. National mechanisms such as an information policy and an eStrategy were established in 2003 to promote the use of ICT. That same year, procurement policies or strategies to guide software, hardware and content acquisition were successfully implemented. A national eHealth policy, which will set out a vision and objectives to promote the use of ICT in the health sector, should be developed by 2008. Norms and standards for eHealth systems, services or applications will also be adopted by 2008.

Infrastructure – access to information and communication technologies

To date, none of the specified actions to support ICT infrastructure development have been implemented and a decision remains to be made as to which actions will be taken in the next two years.

Cultural and linguistic diversity, and cultural identity

Currently, none of the specified actions to promote the development of electronic multicultural health content have been implemented and a decision remains to be made as to which actions will be taken.
Content – access to information and knowledge

Online access to health content has been provided in Belarus through international electronic journals for health professionals and through electronic health information for the general public. The latter commenced in 1994 and is rated as moderately effective. This will continue over the next two years.

Capacity – human resources knowledge and skills

ICT capacity in Belarus has been built through the use of undergraduate or postgraduate training in ICT, and continuing education in ICT. ICT skills courses as a part of university curricula for health sciences students have been offered since 2000 and this action is rated as moderately effective. That same year, ICT skills programmes in the ongoing training of health-care professionals commenced, and this has also been moderately effective.

eHealth tools and eHealth services

National electronic registries, and telehealth are rated as extremely useful if the World Health Organization could offer these as generic prototypes for adaptation to Belarus. The majority of the listed eHealth services are considered very useful.

---

**Table: Country indicators**

<table>
<thead>
<tr>
<th>Country Indicators</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (000s)</td>
<td>9,866</td>
</tr>
<tr>
<td>GDP per capita (Int $)</td>
<td>18,359</td>
</tr>
<tr>
<td>Total health expenditure (% of GDP)</td>
<td>6.4</td>
</tr>
<tr>
<td>ICT Diffusion Index</td>
<td>0.3329</td>
</tr>
<tr>
<td>Main telephone lines*</td>
<td>32.24</td>
</tr>
<tr>
<td>Internet users*</td>
<td>24.98</td>
</tr>
<tr>
<td>Mobile phone subscribers*</td>
<td>22.73</td>
</tr>
</tbody>
</table>
Belgium reports that all but one of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken and are rated from moderately to extremely effective. They will be reviewed and continued over the next two years. An information policy, an eStrategy, and an eHealth policy were implemented during the late 1980s and early 1990s to promote the use of ICT. Specific health sector mechanisms, such as public and private funding and eHealth standards have been successfully introduced in Belgium over the past 10 years. The implementation of procurement policies to guide software, hardware and content acquisition in the health sector has been extremely effective. Equally effective has been the adoption of norms and standards for eHealth systems, services and applications. The promotion of multilingualism and cultural diversity was established in 1988. The creation of a health information system and health legislation that mandates the specific use of ICT has been reported as the most effective action in building an enabling environment for the use of ICT in the health sector.

ICT infrastructure development for the health sector is supported in Belgium through a national plan for the development of ICT in health, a policy on affordability of infrastructure, and through intersectoral and nongovernmental cooperation. This plan, which sets targets for health sector connectivity, was implemented in 2003 and is reported to be moderately effective. Intersectoral cooperation to promote infrastructure development commenced in 2002 and has so far been slightly effective. All initiatives will continue over the next few years.

The development of electronic multicultural health content is promoted through the introduction of multilingual projects since 2004. The programme’s effectiveness is so far unknown but these projects will continue over the next two years.
Content – access to information and knowledge

Online access to health content for the general public and health-care professionals has been provided through the provision of international electronic journals and a digital national open archive for scientific research. These are both reported to have been slightly effective and will continue over the next few years. Belgium highlights the establishment of the Federal Health Care Center as its most effective action taken to promote access to electronic health content.

Capacity – human resources knowledge and skills

ICT capacity has been built through the use of undergraduate and postgraduate training, continuing education in ICT, and through eLearning in health sciences. ICT skills courses as part of university curricula for health sciences students have been offered since 1986 and is rated as moderately effective. ICT skills programmes in the ongoing training of health-care professionals and health sciences courses through eLearning for health professionals in training and practice have been offered since 2003. These educational programmes will continue over the next few years.

eHealth tools and eHealth services

National electronic registries, national drug registries, and Decision Support Systems (DSS) are rated as very useful if the World Health Organization could offer these as generic prototypes for adaptation. Information on trends and developments in eHealth, advice on eLearning programmes, and advice on human resources development for eHealth are considered very useful eHealth services.
Croatia

Enabling environment – policies and strategies to support the information society

Croatia reports that the majority of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken and are rated from slightly to very effective. They are likely to be reviewed and continued over the next two years. The availability of information in local languages which recognize cultural diversity will start by 2008. Croatia highlights the successful introduction of telemedicine, virtual polyclinics, video conferencing, telepathology, teleradiology, teleurosurgery, telecardiology, and tele-education services (all begun in 1995). A very effective action has been a pilot project of the Primary Care Information System (conducted between 2001 and 2003). It aimed to develop and deploy a health information system, based on the latest technologies, which would improve the quality of primary health care through the provision of timely and accurate information. Sixty physicians and nurses were equipped with computers connected via a central server to the main national health insurer, the state treasury and the public health institute. This ensured rapid retrieval of documents, eliminated the need for manual input of data and helped predict system interventions. The project also introduced electronic smart cards for physicians and nurses, so that at each medical check-up the information system verified the status and rights of the patient as well as the physician or nurse. Based on the experiences from this pilot project, a plan has been developed for a comprehensive health information system at the national level that will connect primary health care facilities, hospitals, laboratories, dental clinics, health insurance companies, the state treasury, the public health institute and electronic health record databases. However, the lack of financial resources and a situation of insufficient intersectoral cooperation poses significant challenges.

Infrastructure – access to information and communication technologies

ICT infrastructure development for the health sector is supported in Croatia through a national ICT in health development plan, a policy on affordability of infrastructure, and intersectoral and nongovernmental cooperation. These approaches have been rated from slightly to very effective and will be continued over the next few years. Croatia highlights the very successful establishment in 1997 of the Committee for Telemedicine through the Croatian Medical Academy. The creation of a telemedicine network for health services provision for the population and the provision of software for primary care units have been rated as the most effective initiatives in building ICT infrastructure for the health sector. However, the difficulty in establishing integrated information networks across various levels of the health sector and health insurance costs pose significant challenges in infrastructure development.

Cultural and linguistic diversity, and cultural identity

The development of electronic multicultural health content is promoted in Croatia through the introduction of multilingual projects and the support of translation and cultural adaptation. Special projects have also been introduced to promote the development and use of new electronic health content in multiple languages. The translation and cultural adaptation of existing high-quality content (created either locally or abroad) has been supported for the last few years and will be continued.
Content – access to information and knowledge

Online access to health content for the general public and health-care professionals has been provided through national and international electronic journals and a national open archive. These initiatives all commenced around the mid- to late-1990s and have been very effective. They will continue over the next few years. Among the most effective initiatives taken to promote access to electronic health content are the tourist health information portals, an eJournal for public health, and eDZ (a portal for health professionals). Funding and human resources are reported as the most significant challenges in the field of providing online access to health content.

Figure 4. Online access to health content: actions taken or planned within 2 years and their effectiveness rating

Capacity – human resources knowledge and skills

Capacity in Croatia has been built through the use of undergraduate or postgraduate training in ICT, continuing education in ICT, and through eLearning in health sciences. These are rated from moderately to very effective and will continue over the next few years. Among the most effective actions reported are the postgraduate education programme in Health Information Systems, continuing education in primary health care, and a programme established in cooperation with the Croatian Chamber of Physicians in ICT for health. The difficulty in having medical informatics recognized as a medical profession is posing a significant challenge in this field.

Figure 5. ICT capacity in the health sector: actions taken or planned within 2 years and their effectiveness rating

eHealth tools and eHealth services

Decision Support Systems (DSS) is rated as extremely useful if the World Health Organization could offer it as a generic prototype for adaptation. All other listed eHealth tools are rated from moderately to very useful. Information on effective/best eHealth practices and advice on human resources development for eHealth are considered as very useful eHealth services.

Figure 6. Preferred generic eHealth tools to be provided by WHO

Figure 7. Preferred eHealth services to be provided by WHO

For more information see Explanatory notes
For electronic version see http://www.who.int/GOE
Cyprus

Enabling environment – policies and strategies to support the information society

Cyprus reports that the majority of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken. They are likely to be reviewed and continued over the next two years. Policies to promote inclusiveness and equitable access to eHealth, introduced in 2003, have been extremely effective and will be reviewed and continued. Cyprus provides public funding for ICT support to programmes addressing national health priorities and promotes the availability of information in local languages and the recognition of cultural diversity. These actions are considered very effective and likely to continue. One of the most effective actions in building an enabling environment for the use of ICT in the health sector was the publication in 2004 of a document that describes the requirements for a Web-enabled hospital information system. Currently under evaluation, Cyprus plans to implement the project in 2006 for the New Nicosia General Hospital and the New Famagusta General Hospital. If successful, it will be extended to the remaining hospitals on the island. Additional effective actions noted include: the Government Data Network (GDN), which links all government systems together; the Government Internet Note (GIN), which provides an interface between government information systems and the Internet; and an e-Government portal, which will offer e-services to the public (e.g. through public kiosks and mobile devices), expected to be completed in 2007.

Infrastructure – access to information and communication technologies

ICT infrastructure development for the health sector is supported through a national plan for the development of ICT in health and intersectoral and nongovernmental cooperation. These actions started between 2000 and 2003, are rated as moderately effective, and will be reviewed and continued over the next few years. A national policy to reduce the costs of ICT infrastructure for the health sector will be implemented over the next two years.

Cultural and linguistic diversity, and cultural identity

Over the last two years special projects have been introduced to promote the development and use of new electronic health content in multiple languages with great success. Translation and cultural adaptation (localization) of existing high-quality content (created either locally or abroad) has also been supported in Cyprus during this period. Both actions will be reviewed and continued over the next few years.
Electronic health information for the general public has been provided since 2004, and this action, rated as moderately effective, will be reviewed and continued over the next few years. There are plans to implement a policy for a digital national open archive for scientific research (published within the country) by 2008. Cyprus highlights the development of the web site of the Ministry of Health as its most effective action taken to promote access to electronic health content as it has significantly increased the availability of health information to the general public.

Capacity – human resources knowledge and skills

ICT capacity has been built through the use of continuing education in ICT. Initiated in 2003, the provision of ICT skills programmes in the ongoing training of health-care professionals has been moderately effective and will be reviewed and continued over the next two years. No decision has yet been made with respect to offering ICT skills courses as a part of university curricula for health sciences students or health sciences courses through eLearning for health professionals in training and practice.

Content – access to information and knowledge

Figure 4. Online access to health content: actions taken or planned within 2 years and their effectiveness rating
Czech Republic

Enabling environment – policies and strategies to support the information society

The Czech Republic reports that slightly fewer than half of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken. National mechanisms such as an information policy (2000) and an eStrategy (2003) have been put in place to promote the use of ICT. Public funding for ICT support of programmes addressing national health priorities has been provided since 1990, and norms and standards for eHealth systems and services have been adopted since 1994. All have so far been moderately successful and will continue over the next few years. The Czech Republic highlights in this field the project Netc@rds, initiated by eTEN/EC for a common interoperable platform to enable access to health care services via cellular networks in all EC member countries. The most effective initiatives in building an enabling environment for the use of ICT in the health sector include: MeDiMed, the first and only integrated regional system in the area of health telematics in the Czech Republic; an ongoing pilot project in the city of Litoměřice on electronic patient and health-care provider identification called the Phare Mácha project; a national data standard for healthcare data communication (used by laboratories to send their data to clinics); a national health and public health register; two health insurance portals; a portal of the Institute of Health Information and Statistics; and a national information system maintaining records of patient medication. The most significant challenge in this field has been the lack of a coordinated approach to ICT as the significant players in health care (state/local administrations, health-care providers, insurance companies) purportedly have other priorities. As eHealth is still being established in the Czech Republic, individual hospital or department applications prevail over coordinated efforts.

Infrastructure – access to information and communication technologies

ICT infrastructure development for the health sector is supported in the Czech Republic through intersectoral and nongovernmental cooperation. This was facilitated by the work of MEDTEL, a nongovernmental organization for eHealth promotion set up in 2003 by a group of individuals, mostly coming from IT companies and health care facilities. A decision remains to be made as to what action will be taken on a national plan for the development of ICT in health and on the implementation of a national policy to reduce the costs of ICT infrastructure.

Cultural and linguistic diversity, and cultural identity

At this stage, none of the specified actions to promote the development of electronic multicultural health content have been implemented and a decision remains to be made as to which actions will be taken.
Online access to health content has been provided in the Czech Republic through national and international electronic journals, a digital national open archive, and the availability of electronic health information for the general public. These actions were all implemented during the 1990s and are rated as being moderately effective. Highlighted as very effective in this field are: RANKMED – health web pages assessment and evaluation; CITMED – automatic assessment of health web pages citation level; and EU-MED – a register of relevant European Union (EU) background materials in the field of medical informatics. Providing online access to journals in biomedicine and social sciences for the medical and research communities has been one of the most effective actions taken to promote access to electronic health content. The lack of a coordinated approach to ICT is a significant challenge in this field.

Capacity – human resources knowledge and skills

ICT capacity has been built through the use of undergraduate and postgraduate training in ICT, continuing education in ICT and eLearning in health sciences.

**eHealth tools and eHealth services**

National drug registries, directories of health-care professionals and institutions, and national electronic registries are rated as extremely useful if the World Health Organization could offer these as generic prototypes for adaptation. Information on trends and developments in eHealth is considered an extremely useful eHealth service. All other listed eHealth tools and eHealth services are rated from moderately to very useful.
Denmark

Enabling environment – policies and strategies to support the information society

Denmark reports that the majority of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken and are rated from moderately to extremely effective. They will be reviewed and continued over the next two years. An information policy and an eStrategy were implemented in 1995 and an eHealth policy was introduced in 2000 to promote the use of ICT. Procurement policies to guide software, hardware and content acquisition in the health sector were implemented in 2000 and have been very effective in promoting an enabling environment for ICT. That same year public funding for ICT support of programmes addressing national health priorities became available. Norms and standards for eHealth systems, services and applications, implemented in 1999, have been extremely effective and will be reviewed and continued over the next two years. Also proven very effective have been regulations (enacted in 1995) to protect the privacy and security of individual patient data where eHealth is used. Additionally, various policies have successfully been implemented in Denmark to promote inclusiveness and equitable access to eHealth. The establishment of MEDCOM, a steering committee for IT-messages in health care, is rated as the most effective initiative.

Infrastructure – access to information and communication technologies

Currently, none of the specified actions to support ICT infrastructure development have yet been implemented in Denmark. However, a national plan for the development of ICT in health, which sets targets for health sector connectivity, will be implemented before 2008. A decision remains to be made as to which actions will be taken in the near future for a national policy to reduce the costs of ICT infrastructure in the health sector, and intersectoral and nongovernmental cooperation to promote infrastructure development.

Cultural and linguistic diversity, and cultural identity

The development of electronic multicultural health content is promoted in Denmark through the support of translation and cultural adaptation (localization) of existing high-quality content (created either locally or abroad). This commenced in 2004 and has so far been moderately effective. This action will be reviewed and continued over the next two years.
Content – access to information and knowledge

Online access to health content has been provided through national and international electronic journals and the availability of electronic health information for the general public. Access to international and national electronic journals was introduced in 1995 and 1998, respectively. These services have been moderately effective and will continue. The creation and provision of health information for the general public in electronic format commenced in 2004 and has so far been slightly effective. This will be reviewed and continued over the next few years. Denmark highlights its nationwide web-based health portal as its most effective initiative in promoting access to electronic health content.

Capacity – human resources knowledge and skills

ICT capacity in Denmark has been built through the use of undergraduate and postgraduate training in ICT, continuing education in ICT and through eLearning in health sciences. ICT skills courses as a part of university curricula for health sciences students and ICT skills programmes in the ongoing training of health-care professionals have been offered since 2000 and are rated as slightly effective. Health sciences courses through eLearning for health professionals in training and practice have been offered since 2001 and this is reported to be moderately effective. All actions will be reviewed and continued over the next few years.

Capacity – access to information and knowledge

Online access to health content has been provided through national and international electronic journals and the availability of electronic health information for the general public. Access to international and national electronic journals was introduced in 1995 and 1998, respectively. These services have been moderately effective and will continue. The creation and provision of health information for the general public in electronic format commenced in 2004 and has so far been slightly effective. This will be reviewed and continued over the next few years. Denmark highlights its nationwide web-based health portal as its most effective initiative in promoting access to electronic health content.

Figure 4. Online access to health content: actions taken or planned within 2 years and their effectiveness rating

Capacity – human resources knowledge and skills

ICT capacity in Denmark has been built through the use of undergraduate and postgraduate training in ICT, continuing education in ICT and through eLearning in health sciences. ICT skills courses as a part of university curricula for health sciences students and ICT skills programmes in the ongoing training of health-care professionals have been offered since 2000 and are rated as slightly effective. Health sciences courses through eLearning for health professionals in training and practice have been offered since 2001 and this is reported to be moderately effective. All actions will be reviewed and continued over the next few years.

Figure 5. ICT capacity in the health sector: actions taken or planned within 2 years and their effectiveness rating

eHealth tools and eHealth services

Electronic Health Records (eHR), Patient Information Systems (PIS), General Practitioner Information Systems (GPIS) and telehealth are rated as very useful if the World Health Organization could offer these as generic prototypes for adaptation. Information on effective/best eHealth practices is considered an extremely useful eHealth service. All remaining listed eHealth services are rated from slightly to very useful.

Figure 6. Preferred generic eHealth tools to be provided by WHO

Figure 7. Preferred eHealth services to be provided by WHO

For more information see Explanatory notes.
Estonia

**Enabling environment – policies and strategies to support the information society**

Estonia reports that the majority of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken. National mechanisms such as an information policy, an eStrategy, and an eHealth policy have been in place since the mid-to-late 1990s and have been extremely effective in promoting the use of ICT. Policies promote inclusiveness and equitable access to eHealth, introduced in 1998, have been very effective. Rated as the most effective actions in building an enabling environment for the use of ICT in the health sector are initiatives for an (electronic) personal ID, a digital signature, a secure data exchange system (X-road), a national Internet service provider for the public sector (E-net), and health sector-related landmarks supporting development (e.g. the World Bank loan supporting the IT system for the Health Insurance Fund [1995] and the Information Protection Act [1996]). The most significant challenges reported to date in this field have been the implementation of eHealth standards by the eHealth Foundation (2005), and the development of eHealth legislation to implement eHealth services.

**Infrastructure – access to information and communication technologies**

ICT infrastructure development for the health sector is supported in Estonia through a national plan for the development of ICT in health, a policy on affordability of infrastructure and intersectoral and nongovernmental cooperation. The national plan, which sets targets for health sector connectivity, was implemented in 2000 and is reported to be very effective. That same year, a policy to reduce the costs of ICT infrastructure for the health sector was implemented and is reported to be moderately effective. All actions in this field will continue over the next few years. The most effective action thus far in building ICT infrastructure for the health sector has been the provision of low-cost access to Internet for the health sector (E-net). Estonia is aiming for 100% Internet coverage by 2008.

**Cultural and linguistic diversity, and cultural identity**

The development of electronic multicultural health content is promoted through the introduction of multilingual projects and through the support of translation and cultural adaptation. Special projects have been introduced since 2004 to promote the development and use of new electronic health content in multiple languages. This has been very effective and will continue over the next two years. The translation and cultural adaptation (localization) of existing high-quality content (created either locally or abroad) has been slightly effective and a decision remains to be made as to what further action will be taken in this field over the next few years.
Content – access to information and knowledge

Online access to health content has been provided through national and international electronic journals (for health professionals), a national open archive for scientific research, and electronic health information for the general public. Access to electronic journals was introduced in 1995 and 2001, respectively, and these services have been moderately to very effective. In 2000, a policy for the digital national open archive (materials published in Estonia) was implemented. Health information for the general public was introduced in 1998 and is rated as moderately effective.

Capacity – human resources knowledge and skills

ICT capacity has been built through the use of undergraduate or postgraduate training in ICT, continuing education in ICT, and through eLearning in health sciences. ICT skills courses as part of university curricula for health sciences students have been offered since 1995 and this action is rated as extremely effective. That same year ICT skills programmes in the ongoing training of health-care professionals started, and this action is reported to be very effective. Health sciences courses through eLearning for health professionals in training and practice have only been offered since 2005. Estonia reports that students (primary and secondary schools, and universities) have been trained in the use of computers and Internet since the early 1990s and this has proven to be a very effective approach in starting to build ICT capacity from an early age.

eHealth tools and eHealth services

All listed eHealth tools are rated as moderately useful if the World Health Organization could offer these as generic prototypes for adaptation. Advice on methods for monitoring and evaluation (M&E) of eHealth services, advice on eHealth norms and standards, information on effective/best eHealth practices, and advice on eLearning programmes are considered moderately useful eHealth services.

For more information see Explanatory notes
For electronic version see http://www.who.int/GOe
Finland

Enabling environment – policies and strategies to support the information society

Finland reports that the majority of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector were implemented between 1995 and 2004. They will be reviewed and continued over the next two years. The promotion of availability of information in local languages and the recognition of cultural diversity has been very effective and will continue. Private funding for ICT support has been secured since 1998 through the research and development programmes of the National Technology Agency (TEKES). The promotion of information in local languages and the recognition of cultural diversity has been very effective in Finland and will continue. The most effective initiative started in this field is the introduction of an evidence-based decision support system called Duodecim. Now in country-wide use, this system provides incentive to health-care professionals to use ICT in their daily work. Finland reports that it is a challenge to implement norms, standards and interoperability of ICT as health-care providers are decentralized.

Infrastructure – access to information and communication technologies

ICT infrastructure development for the health sector is supported in Finland through intersectoral and nongovernmental cooperation. This cooperation has been only slightly effective since 2003 and will be reviewed and continued over the next few years. A national plan for the development of ICT in health, which sets targets for health sector connectivity, will be implemented within the next two years. Similarly, a national policy to reduce the costs of ICT infrastructure for the health sector will also be implemented. Finland highlights the importance of other initiatives in this field such as national services for ICT in health care, and Code Server.

Cultural and linguistic diversity, and cultural identity

The development of electronic multicultural health content is promoted in Finland through the support of translation and cultural adaptation of existing high-quality content (created either locally or abroad). Special projects are planned to begin over the next few years to promote the development and use of new electronic health content in multiple languages.
Online access to health content (for health-care professionals and the public) has been provided through various national and international electronic journals and a digital national open archive. Access to Medline was introduced in 1994 and has been very effective for the medical and research communities. The Finnish national open archive, Helka (introduced in 1995), has been very successful in providing national scientific and health research information. The most effective accomplishment in this field has been the provision of access for all health-care professionals to information databases such as Medline and the national medical database kept by the medical association of Duodecim with other partners. The most significant challenge in this field is that not all access is free of cost.

**Capacity — human resources knowledge and skills**

ICT capacity in Finland has been built through undergraduate and postgraduate training in ICT, continuing education in ICT, and eLearning in health sciences. These actions are rated from moderately to very effective and will continue over the next few years. ICT skills courses as a part of university curricula for health sciences students have been offered since the late 1980s and are rated as very effective. Since the 1990s ICT skills programmes in the ongoing training of health-care professionals have been introduced and have so far been moderately effective. The shortage of health-care professionals is a significant challenge in this field.

**eHealth tools and eHealth services**

Directories of health-care professionals and institutions, and national drug registries are respectively rated as extremely and very useful. All other listed eHealth tools are rated from slightly to moderately useful if the World Health Organization could offer these as generic prototypes for adaptation. Advice on methods for monitoring and evaluation of eHealth services, and information on effective/best eHealth practices are considered as very useful. All remaining listed eHealth services are rated slightly to moderately useful.
France reports that all of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken and the majority are rated very effective. The only action rated as slightly effective is the promotion of availability of information in local languages and the recognition of cultural diversity (begun in 1999). National mechanisms such as an information policy, an eStrategy, and an eHealth policy were established in 1997, and have been successful. France highlights the introduction of an electronic personal medical file (in 2004) as an important national eHealth initiative. However, it recognizes it is too early to determine the effectiveness of this action at this stage. The introduction of the Vitale medical insurance card and Carte Professionnel de Santé (CPS), a health professional’s card, are seen as effective actions in the use of ICT in the health domain. The most significant challenge to date has been the lack of uniform equipment available to health-care professionals.

Infrastructure – access to information and communication technologies

ICT infrastructure development for the health sector is supported through a national plan for the development of ICT in health, a policy on affordability of infrastructure and through intersectoral and nongovernmental cooperation. These initiatives started in 2000 and have so far been very effective. In this context the introduction of the Vitale medical insurance card and the CPS are also rated as the most effective actions. However, the high cost of financing these projects pose a significant challenge in the development of ICT infrastructure in France.

Cultural and linguistic diversity, and cultural identity

To date, none of the specified actions to promote the development of electronic multicultural health content have been implemented and a decision remains to be made as to which actions will be taken.
Content – access to information and knowledge

Online access to health content has been provided through national and international electronic journals, a national open archive for scientific research and electronic health information for the general public. These were all introduced between 1993 and 1997 and have so far been very effective in promoting online access to health content. France highlights in this field the establishment in 1998 of the Agency Web Portal (http://www.sante.fr), which has been very effective and will continue. Setting up Internet web sites and portals for the general public or for a more targeted audience, have been the most effective actions taken to promote access to electronic health content. Provision of sites with content exclusively for the health-care professional is reported as a significant challenge in this field.

Future action

Access to international journals
Access to national journals
National open archive or repository policies
Health information for the general public

Year
< 95 96 97 98 99 00 01 02 03 04 05 06 >

Capacity – human resources knowledge and skills

ICT capacity in France has been successfully built through the use of undergraduate and postgraduate training in ICT, and continuing education in ICT. These actions are rated as very effective and will continue over the next two years. Health sciences courses through eLearning for health professionals in training and practice will be introduced by 2008.

Future action

Access to international journals
Access to national journals
ICT capacity
Health information

Capacity indicators
Population (000s)
GDP per capita (Int $)
Total health expenditure (% of GDP)

OECD country
World Bank category
ICT Diffusion Index

Main telephone lines*
Internet users*
Mobile phone subscribers*

Electronic Health Records (eHR), Patient Information Systems (PIS), Hospital Information Systems (HIS), General Practitioner Information Systems (GPIS), Geographical Information Systems (GIS), Decision Support Systems (DSS), telehealth, and directories of health-care professionals and institutions are rated as very useful if the World Health Organization could offer these as generic prototypes for adaptation. Advice on human resources development for eHealth, advice on eHealth norms and standards, information on trends and developments in eHealth, advice on eLearning programmes, and information on effective/best eHealth practices are considered as very useful eHealth services.

Figure 4. Online access to health content: actions taken or planned within 2 years and their effectiveness rating

Figure 5. ICT capacity in the health sector: actions taken or planned within 2 years and their effectiveness rating

Figure 6. Preferred generic eHealth tools to be provided by WHO

Figure 7. Preferred eHealth services to be provided by WHO

For more information see Explanatory notes
For electronic version see http://www.who.int/GOe

* per 100 inhabitants
Germany reports that all of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken and are rated from slightly to very effective. They will be reviewed and are likely to be continued over the next two years. National mechanisms such as an information policy, an eStrategy, and an eHealth policy have been put in place to promote the use of ICT since the mid 1990s. Specific health sector mechanisms such as public-private partnerships, procurement policies, public and private funding and eHealth standards have been successfully introduced. Protection and inclusiveness policies for citizen protection, equitable access to eHealth, multilingualism and cultural diversity have also been in place since the 1990s. Germany mentions the establishment in 2003 of the Aktionsforum Gesundheitsinformationssystem, which provides high-quality of health information to health professionals. The federal legislation on the eHealth card (SHI Modernization Act, enforced in 2004) is rated as the most effective action in building an enabling environment for the use of ICT in the health sector. The most significant challenge to date in this field has been standardizing practices and creating interoperability between eHealth systems nationwide.

Infrastructure – access to information and communication technologies

ICT infrastructure development for the health sector is supported through a national plan for the development of ICT in health, and through intersectoral and nongovernmental cooperation. A national plan, which sets targets for health sector connectivity, was implemented in 1997 and is reported to be very effective. That same year Germany started successfully working with intersectoral and nongovernmental partners to promote infrastructure development and will continue to do so. Federal legislation on the eHealth card is rated as the most effective action in this field. The most significant challenge is financing the eHealth infrastructure since the cost-benefit ratio appears to be less favourable, or at least unclear, for health care providers than for sickness funds/private health insurers. Data protection and security of patients and health professionals are other challenges.

Cultural and linguistic diversity, and cultural identity

The development of electronic multicultural health content is promoted through the introduction of multilingual projects and support of translation and cultural adaptation. Special projects have been introduced in Germany since 2004 to promote the development and use of new electronic health content in multiple languages. From 2004, the translation and cultural adaptation (localization) of existing high-quality content (created either locally or abroad) has also been supported. These initiatives have been only slightly effective, however, and will be reviewed and continued over the next two years. The conceptualization of culturally adapted health content has been a significant challenge in this field.
Content – access to information and knowledge

Health professionals have had access to online health content through international and national electronic journals since the 1990s. During this time, a national open archive for scientific research was also created, and electronic health information was made available to the general public. All these actions are rated from slightly to very effective. Germany highlights the joint evaluation of the evidence base of patient information by patient- and physician-run organizations and other stakeholders as its most effective action taken to promote access to electronic health content. Providing patient information effectively at the point of care which adequately addresses their questions (considering factors such as the stage and severity of their condition, their understanding of their illness, and their general level of education/literacy) is reported as the most significant challenge to date in this field.

Capacity – human resources knowledge and skills

ICT capacity in Germany has been built through the use of undergraduate and postgraduate training in ICT, continuing education in ICT, and through eLearning in health sciences. These actions are rated from slightly to moderately effective and will be reviewed and continued over the next two years. The Physicians’ Approbation Ordinance and the revision of the apprenticeship and training of “feldschers” (physicians’ assistants in ambulatory physicians’ surgeries) are the most effective capacity building actions reported. Significant challenges in building ICT capacity in the health sector have been providing education in new technologies, integrating ICT into learning methods and creating relevant courses for undergraduate and postgraduate students, as well as for continuing professional development.

eHealth tools and eHealth services

All listed eHealth tools are rated from slightly to moderately useful if the World Health Organization could offer these as generic prototypes for adaptation. Advice on eHealth norms and standards, and information on trends and developments in eHealth are considered very useful eHealth services.
Hungary

Enabling environment – policies and strategies to support the information society

Hungary reports that the majority of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken and are rated from slightly to very effective. They are likely to be reviewed and continued over the next two years. Hungary highlights a government financed national eHealth Development Program (http://www.e-egeszseg.hu), which commenced in 2004 and has so far been moderately effective in raising the profile of eHealth. To date, the most effective action is the development of eHealth Standards as part of the national eHealth Program (accepted by the Hungarian Standards Institute [MSZT]). Additionally, a national health portal with services for citizens (http://www.dr.info.hu) and professionals (http://www.euagazat.hu) is operational and being expanded. The most significant challenges in this field are reforming the legal environment (i.e. currently privacy legislation forbids the creation of electronic eHealth records), and increasing the cooperation between public administration organizations. To overcome deficiencies in daily health sector ICT project management, the National Institute for Strategic Health Research established the National eHealth Program Management Unit which has the relevant expert capacity but currently lacks official status.

Infrastructure – access to information and communication technologies

ICT infrastructure development for the health sector is supported in Hungary through a national plan for the development of ICT in health, and through intersectoral and nongovernmental cooperation. The former, which sets targets for health sector connectivity, was implemented in 2003 and is reported to be moderately effective. The latter was implemented in 2003 as well, and will continue. The creation of a national policy to reduce the costs of ICT infrastructure for the health sector will begin within the next two years.

Cultural and linguistic diversity, and cultural identity

The development of electronic multicultural health content is promoted through the translation and cultural adaptation (localization) of existing high-quality content (created either locally or abroad). As part of the national eHealth Project, the contents of the Clinical Evidence (CE) Database were made available for health-care professionals working in hospitals and clinics, based on an application/training/usage monitoring approach. The concise version of the CE was translated into Hungarian. The most significant challenge in this field is the lack of health professionals speaking foreign languages.
Content – access to information and knowledge

Online access to health content has been provided through national and international electronic journals (for health professionals), a national open archive for scientific research, and electronic health information for the general public. The National Institute for Strategic Health Research in Hungary established the Internet-based Hungarian Health Data warehouse, which presents various data on the health care system, according to national and international indicator sets. The most effective initiative taken to promote access to electronic health content is the establishment of a web- and call centre-based health information source for citizens which also offers services for health professionals (http://www.dr.info.hu). ‘Dr. Info’ (also known as HealthLine) provides high-quality health information for citizens and health care providers.

Capacity – human resources knowledge and skills

ICT capacity has been built in Hungary since 1996 through the use of undergraduate and postgraduate training in ICT, and continuing education in ICT. It is reported that experimental eLearning applications have been used since 1994 at several different universities and colleges, but they are not part of the approved curricula. Some of the most effective actions reported are starting/accrediting curricula for health-systems administrators at college level and starting/accrediting curricula for health-information system managers at the university level. The most significant challenge in this field is the lack of adequate financial resources in the area of higher education and the lack of commitment for health-related ICT education in medical schools.

eHealth tools and eHealth services

National electronic registries, national drug registries, Decision Support Systems (DSS), telehealth, directories of health-care professionals and institutions, tools to facilitate the interoperability of health information systems, and suggested data models and methodologies are rated as very useful if the World Health Organization could offer these as generic prototypes for adaptation. Advice on methods for monitoring and evaluation of eHealth services, advice on eHealth norms and standards, information on trends and developments in eHealth, information on effective/best eHealth practices are considered very useful eHealth services.
Iceland reports that the majority of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken and are rated moderately effective. They will be reviewed and are likely to be continued over the next few years. National mechanisms such as an information policy, an eStrategy, and an eHealth policy were established between 1996 and 2004 to promote the use of ICT. Specific health sector mechanisms, such as procurement policies, public funding and eHealth standards have been successfully introduced. Policies to promote inclusiveness and equitable access to eHealth (i.e. access irrespective of culture, education, language, geographical location, physical and mental ability, age and gender) will be implemented by 2008. The decision to use the same Electronic Health Records (eHR) system for all health care centres has been the most effective action in building an enabling environment for the use of ICT in the health sector. It enables integration of information and efficient coordination among centres. The establishment of a national ‘health net’ is reported as the most significant challenge in this field. The Ministry of Health and various stakeholders are collaborating to address this.

**Enabling environment – policies and strategies to support the information society**

![Figure 1. Enabling environment for ICT in the health sector: actions taken or planned within 2 years and their effectiveness rating](image)

**Infrastructure – access to information and communication technologies**

ICT infrastructure development for the health sector is supported in Iceland through a national plan for the development of ICT in health, which sets targets for health sector connectivity. The plan was implemented in 2001 and is reported to be slightly effective. A national policy to reduce the costs of ICT infrastructure for the health sector is likely to be implemented over the next few years. The project plan for building a health network, published in 2000, is rated as the most effective action in building ICT infrastructure for the health sector (it has been a base for several successful projects). The most significant challenge to date in this field has been to secure financial support for the establishment of the health network. This has been addressed by sending contributions directly to projects and re-allocating funds within institutions more appropriately.

![Figure 2. ICT infrastructure development for the health sector: actions taken or planned within 2 years and their effectiveness rating](image)

**Cultural and linguistic diversity, and cultural identity**

Currently, none of the specified actions to promote the development of electronic multicultural health content have been implemented in Iceland. However, there are plans to introduce special projects to promote the development and use of new electronic health content in multiple languages over the next few years. Translation and cultural adaptation of existing high-quality content (created either locally or abroad) will also commence by 2008.

![Figure 3. Electronic multicultural health content: actions taken or planned within 2 years and their effectiveness rating](image)
Health professionals have had access to online health content through international and national electronic journals since 1998 and 2000, respectively. The general public has recently been provided with electronic health information as well. A policy for a digital national open archive for scientific research (published in the country) will be implemented over the next few years. Iceland highlights the provision of online access to scientific literature both for professionals and the general public (www.hvar.is) as its most effective action taken to promote access to electronic health content.

ICT capacity has been built through the use of undergraduate and postgraduate training in ICT, continuing education in ICT, and eLearning in health sciences. These actions are rated from moderately to very effective and will be reviewed and continued over the next few years. ICT skills courses as a part of university curricula for health sciences students have been offered since 2002. At the same time, ICT skills programmes in the ongoing training of health-care professionals were introduced. One year later, health sciences courses through eLearning for health professionals in training and practice were offered as well. The introduction of courses in Health Informatics at undergraduate and graduate university levels is reported as the most effective action in building ICT capacity in the health sector. The establishment of distance learning is, however, posing a significant challenge in this field.

All listed eHealth tools are rated from slightly to moderately useful if the World Health Organization could offer these as generic prototypes for adaptation. Advice on methods for monitoring and evaluation (M&E) of eHealth services, information on effective/best eHealth practices, advice on eHealth norms and standards, and information on trends and developments in eHealth are considered as very useful eHealth services.

<table>
<thead>
<tr>
<th>Effectiveness</th>
<th>Future action</th>
<th>Usefulness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely effective</td>
<td>C</td>
<td>5</td>
</tr>
<tr>
<td>Very effective</td>
<td>R</td>
<td>4</td>
</tr>
<tr>
<td>Moderately effective</td>
<td>S</td>
<td>3</td>
</tr>
<tr>
<td>Slightly effective</td>
<td>P</td>
<td>2</td>
</tr>
<tr>
<td>Not effective</td>
<td>U</td>
<td>1</td>
</tr>
<tr>
<td>Unknown effectiveness</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Start date unknown</td>
<td>No data / No action</td>
<td>0</td>
</tr>
<tr>
<td>No data</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

* per 100 inhabitants

For more information see Explanatory notes
For electronic version see http://www.who.int/GOe
Israel reports that the majority of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken and are rated from moderately to very effective. They are likely to continue over the next two years. It highlights the computerized National Health Records (NHR) project that collect relevant patient data and information and makes it available to care providers. The system is designed to create a virtual health record for all Israeli citizens, connecting them to the health-care sector. Additionally, it will incorporate four health maintenance organizations (HMOs), the Israeli defense force, the Ministry of Health, the National Insurance Institute, and all public clinics and hospitals. The most effective action in building an enabling environment for the use of ICT in the health sector has been the initiation of the ‘Ofek’ project by Israel’s largest HMO. Ofek is responsible for the integration of the medical information of all those insured in the HMO (3.7 million people). It is based on a unique software tool, which creates a patient record that can be observed by all care providers at any point of health care delivery. The most significant challenge in this field is the process of creating and maintaining the NHR. It is both a technical and medical informatics challenge, since the goal is to retrieve information from various sources and databases and transmit it to appropriate points of care, in a way that doesn’t interfere with the consultation between the patient and the health service provider.

### Enabling environment – policies and strategies to support the information society

<table>
<thead>
<tr>
<th>National information policy or strategy</th>
<th>C</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>National ePolicy or eStrategy</td>
<td>C</td>
<td>U</td>
</tr>
<tr>
<td>Procurement policies or strategies</td>
<td>U</td>
<td>U</td>
</tr>
<tr>
<td>Public funding</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Private funding</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Public-private partnerships</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>eHealth standards</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Citizen protection</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Equity</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Multilingualism and cultural diversity</td>
<td>C</td>
<td>C</td>
</tr>
</tbody>
</table>

**Figure 1.** Enabling environment for ICT in the health sector: actions taken or planned within 2 years and their effectiveness rating

### Infrastructure – access to information and communication technologies

ICT infrastructure development for the health sector is supported in Israel through a national plan for the development of ICT in health and through intersectoral and nongovernmental cooperation. Israel highlights other important contributing factors such as enhanced long-distance communication, data and information security and confidentiality, creation of central data repositories, development of relevant data storages, consolidation of servers and integration of standard eHealth tools. These actions were all introduced around 1995 and have been very effective. The development of the infrastructure components for the computerized NHR project is rated as the most effective action in building ICT infrastructure for the health sector to date.

### Cultural and linguistic diversity, and cultural identity

Currently, none of the specified actions to promote the development of electronic multicultural health content have been implemented and a decision remains to be made as to which actions will be taken.

**Figure 3.** Electronic multicultural health content: actions taken or planned within 2 years and their effectiveness rating
Content – access to information and knowledge

Online access to health content has been provided in Israel through a digital national open archive for scientific research and the availability of electronic health information for the general public. These have both been moderately effective and will be continued over the next few years. Medical laboratory results have been available electronically since 2000 to patients and physicians, as has information concerning general health issues and that on the topic of health promotion. Patients with chronic diseases receive relevant medical information online from the HMO’s digital repositories. NHR and Ofek are noted as the most effective actions taken to promote access to electronic health content.

Capacity – human resources knowledge and skills

ICT capacity in Israel has been built through the use of undergraduate and postgraduate training in ICT. These courses have been offered as part of university curricula for health sciences students since 1985 and are rated as moderately effective. A series of special non-academic courses, designated for different sectors of the Israeli health care system, regarding the principles and use of medical informatics have also been offered since 1985.

eHealth tools and eHealth services

Hospital Information Systems (HIS), national drug registries, and directories of health-care professionals and institutions are rated as very useful if the World Health Organization could offer these as generic prototypes for adaptation. Advice on national needs assessments for eHealth, advice on methods for monitoring and evaluation (M&E) of eHealth services, advice on eHealth norms and standards, and information on effective/best eHealth practices are considered as very useful eHealth services.
Enabling environment – policies and strategies to support the information society

Latvia reports that a national information policy was implemented in 2002, a national ePolicy in 2004 and a national eHealth policy introduced in 2005. These initiatives are rated as moderately effective and will be continued over the next two years. Regulations to protect the privacy and security of individual patient data where eHealth is used were introduced in 2001 and this is considered a very effective action and will continue. Procurement policies, norms and standards for eHealth systems and policies to promote inclusiveness and equitable access to eHealth are likely to be introduced by 2008. The most important initiative in building an enabling environment for the use of information and communication technologies (ICT) in the health sector is reported to be the development of the national strategy ‘eHealth in Latvia’, which was approved by the Cabinet of Ministers in August 2005. The main challenge has been the development of the strategy for eHealth in Latvia due to difficulties arising from insufficient expertise in this area.

Infrastructure – access to information and communication technologies

ICT infrastructure development for the health sector is supported in Latvia through intersectoral and nongovernmental cooperation. This was introduced in 2006 and has so far been slightly effective. It will be reviewed and continued over the next two years.

Cultural and linguistic diversity, and cultural identity

At this stage, none of the specified actions to promote the development of electronic multicultural health content have been taken and a decision remains to be made as to which actions will be introduced.
### Content – access to information and knowledge

Online access to international journals was introduced in 2003 in Latvia. This service is rated as slightly effective and a decision remains to be made whether it will continue. Health information for the general public was also introduced in 2003 and is likely to be reviewed and continued. The remaining listed actions to promote access to electronic health content have not been implemented and there is currently no decision as to whether they will be introduced over the next two years.

![Figure 4. Online access to health content: actions taken or planned within 2 years and their effectiveness rating](image)

### Capacity – human resources knowledge and skills

Latvia has been offering ICT skills courses as a part of university curricula (undergraduate or postgraduate) for health sciences students since 1999. ICT skills programmes in the ongoing training of health professionals, and health sciences courses through eLearning for health professionals in training and practice were introduced in 1995. These educational programmes are rated from moderately to very effective and are expected to be reviewed and continued over the next two years.

![Figure 5. ICT capacity in the health sector: actions taken or planned within 2 years and their effectiveness rating](image)

### eHealth tools and eHealth services

Latvia rates Electronic Health Records (eHR) and Geographical Information Systems (GIS) as very useful eHealth tools if the World Health Organization could offer these as generic prototypes for adaptation. The majority of the specified eHealth services are considered from very to extremely useful.

![Figure 6. Preferred generic eHealth tools to be provided by WHO](image)

![Figure 7. Preferred eHealth services to be provided by WHO](image)
Lithuania reports that a majority of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been introduced and they are likely to continue over the next two years. A national information policy, as well as policies that promote availability of information in local languages and recognize cultural diversity, were implemented in 1991. The implementation of procurement policies to guide software, hardware and content acquisition in the health sector is expected to commence in the next two years, as is the implementation of policies to promote inclusiveness and equitable access to eHealth. To date, no decision has been made to form public-private partnerships to foster the use of ICT within the health sector.

Infrastructure – access to information and communication technologies

A national plan for the development of ICT in health was introduced in 2005 and is likely to continue. It is anticipated that a policy on affordability of infrastructure will be implemented by 2008. At this stage, no decision has been made as to whether intersectoral and nongovernmental cooperation will be introduced over the next two years.

Cultural and linguistic diversity, and cultural identity

To date, none of the specified actions to promote the development of electronic multicultural health content have been taken and a decision remains to be made as to which actions will be introduced.
Content – access to information and knowledge

Online access to international journals for health professionals has been provided since 2001 and to health information for the general public since 1999. Both actions are expected to continue.

Capacity – human resources knowledge and skills

ICT skills courses are part of university curricula (undergraduate and postgraduate) for health sciences students and are expected to continue over the next two years, as are health sciences courses through eLearning for health professionals. By 2008, Lithuania expects to provide ICT skills programmes in the ongoing training of health professionals.

eHealth tools and eHealth services

Decision Support Systems (DSS) are rated as very useful eHealth tools if the World Health Organization could offer them as a generic prototypes for adaptation. Advice on eHealth norms and standards is considered an extremely useful eHealth service.
Luxembourg

Enabling environment – policies and strategies to support the information society

Luxembourg reports that a national information policy and an ePolicy were re-launched in 2000. Public funding and public-private partnership actions commenced in 2004, the latter quoted as very effective. A policy for citizen protection in the area of eHealth was introduced in 1979 and rated as moderately effective. All of the actions taken in this area are planned to continue. A policy on eHealth standards is expected to be introduced by 2008. The following actions are listed as contributing to building an enabling environment: the creation of an economic interest group to maximize the performance of the country’s health network; a feasibility study of the health portal, which brought public and private health partners together and now is entering its second stage after validation by the Ministry of Health; and a politically more favourable climate for information and communication technologies (ICT) in the health sector. Lacking awareness of the opportunities offered by ICT and the absence of a clearly defined eHealth policy are reported as significant challenges.

Infrastructure – access to information and communication technologies

The implementation of a national plan for the development of ICT in health is reported to start by 2008. To date, no decision has been made as to whether a national policy to reduce the costs of ICT infrastructure for the health sector will be introduced over the next two years. Luxembourg adopted a strategy on intersectoral and nongovernmental cooperation in 2005 and reports this action to be very effective and to continue. The HealthNet pilot is described as an effective action to support the ICT infrastructure development for the health sector.

Cultural and linguistic diversity, and cultural identity

At this stage, none of the specified actions in this area have been implemented. However, a policy on multilingual projects, to promote and use new electronic health content in multiple languages, will be launched by 2008.
content – access to information and knowledge

Of the listed actions, Luxembourg has implemented a policy on a national open archive for scientific research and the provision of health information for the general public. These initiatives are rated as very effective and moderately effective, respectively, and are expected to continue. There is no decision reported on providing online access to international and national journals for its medical communities. However, during the coming years the National Health Portal project will be publishing online public health information for the general public and a database for professional use will be created.

capacity – human resources knowledge and skills

To date, none of the listed actions have been implemented and it remains to be decided whether they will be started by 2008. Reference is made to ICT training programmes provided by the Henri Tudor Public Research Centre and SITec (training centre of the Henri Tudor PRC). These provide access to expertise in the field of ICT through the University of Luxembourg and its European network of partner universities, and technology partners.

eHealth tools and eHealth services

All of the listed eHealth tools are rated as very useful if WHO could offer these as generic prototypes for adaptation. Among the specified eHealth services information on effective/best eHealth practices and advice on eHealth norms and standards are reported as extremely useful. The rest of the listed services are considered very useful. The rest of the listed services are considered very useful.
Norway

Enabling environment – policies and strategies to support the information society

Norway reports that the majority of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken and will continue. Regulations to protect the privacy and security of individual patient data where eHealth is used were introduced in 1980 and have been rated as extremely effective and are likely to continue. The provision of public funding and the formation of public-private partnerships to foster the use of ICT within the health sector are considered very effective actions. Among several ongoing activities, Norway highlights the Lighthouse programme and the electronic interchange of health information (ELIN) project, both targeting the social and health care sector. Additionally, the website ‘Min side’ [My page], targeting the general public, is mentioned. The establishment of the Norwegian Health Net (http://www.norsk-helsenet.no/tiki-view_articles.php), described as the backbone of eHealth services and systems, is reported to be the most effective action in this field. Norway states that the national coordination of financial, legal and security aspects of eHealth poses the most significant challenge in this area.

Infrastructure – access to information and communication technologies

A national plan for the development of ICT in health, which sets targets for health sector connectivity, was implemented in 1997 and is rated as very effective and likely to continue. In 2004, a national policy to reduce the costs of ICT infrastructure for the health sector was introduced. This is considered a very effective action which is likely to be reviewed and continued. Norway indicates that it works very effectively with intersectoral and nongovernmental partners to promote infrastructure development. The picture archive and communication systems (PACS) and Electronic Health Records are highlighted as other important projects in building ICT infrastructure for the health sector. The geography of Norway and its dispersed population pose a significant challenge for developing a telecommunications infrastructure. The Norwegian Health Net was created through the development of regional networks and their merging into the national Health Net proved a significant challenge, as the various regions had chosen different technologies. Today the Norwegian Health Net is implemented in all regions.

Cultural and linguistic diversity, and cultural identity

Norway has not developed a large amount of health content in other languages since the number of people in the country who do not speak Norwegian is very low and information in other languages is already available online.
Health professionals have had access to online health content through international and national electronic journals since 2005. An initiative to create and provide electronic health information for the general public will be reviewed and continued over the next two years. Several governmental institutions, in addition to nongovernmental organizations, patient organizations and commercial services, developing web sites with health content for the general public. Legal issues concerning the grey area between health information and health advice is mentioned as a challenge. To date, no decision has been made as to whether a policy for a digital national open archive for scientific research (published within the country) will be implemented.

**Content – access to information and knowledge**

Health professionals have had access to online health content through international and national electronic journals since 2005. An initiative to create and provide electronic health information for the general public will be reviewed and continued over the next two years. Several governmental institutions, in addition to nongovernmental organizations, patient organizations and commercial services, developing web sites with health content for the general public. Legal issues concerning the grey area between health information and health advice is mentioned as a challenge. To date, no decision has been made as to whether a policy for a digital national open archive for scientific research (published within the country) will be implemented.

**Capacity – human resources knowledge and skills**

ICT skills courses as a part of university curricula for health sciences students and ICT skills programmes in the ongoing training of health-care professionals are offered in Norway. These educational programmes will continue over the next two years. Health sciences courses through eLearning for health professionals (in training and practice) have been very effective and will be reviewed and continued. Other important initiatives are the basic ICT training courses awarding a certificate (Datakortet); a Masters programme in telemedicine and eHealth; and ICT training for health-care professionals. The most effective action in this field is the inclusion of ICT training as part of the general education for health professionals and the provision of online training courses for those who have not yet received their basic training. The lack of hardware and Internet connectivity in health care institutions pose significant challenges.

**eHealth tools and eHealth services**

Telehealth and directories of health-care professionals are rated as very useful eHealth tools if the World Health Organization could offer these as generic prototypes for adaptation to Norway. Of the specified eHealth services, information on effective/best eHealth practices, advice on eHealth norms and standards and information on trends and developments in eHealth are considered very useful. Norway adds that Telemedicine and eHealth services have been in place since the 1980s and are in the process becoming part of the general health services.
Building Foundations for eHealth

WHO EUROPEAN REGION

Poland

Enabling environment – policies and strategies to support the information society

Poland reports that the majority of the actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken and are likely to continue. Among national mechanisms an information policy and an ePolicy were implemented in 2000 and 2001, respectively, and rated as moderately effective. Public funding for ICT support of programmes addressing national health priorities has been provided since 1996 and public-private partnerships to foster the use of ICT within the health sector have been formed since 2005. Norms and standards for eHealth systems, services or applications have been effectively adopted since 1999. The same year regulations to protect the privacy and security of individual patient data where eHealth is used were introduced and this has been rated as very effective. The implementation of a national eHealth policy is expected to commence by 2008, as will the implementation of procurement policies to guide software, hardware and content acquisition in the health sector. To date, no decision has been made as to which of the remaining listed actions will be introduced over the next two years. The most effective action is reported to be the standardization of medical administrative data such as central registers of insured persons, health professionals, providers of medical services and infectious diseases. This has facilitated the effective processing and management of data in the health care system.

Infrastructure – access to information and communication technologies

The implementation of a national policy to reduce the costs of ICT infrastructure for the health sector will commence by 2008. Poland indicates that it works very effectively with intersectoral and nongovernmental partners to promote infrastructure development and will continue to use this approach. Currently, no decision has been made as to whether a national plan for the development of ICT in health, which sets targets for health sector connectivity, will be introduced in the next two years.

Cultural and linguistic diversity, and cultural identity

At this stage, no decision has been made concerning the introduction of multilingual projects. However, the translation and cultural adaptation of existing high-quality content (created either locally or abroad) has been supported since 1995, and is considered very effective.
Content – access to information and knowledge

Health professionals have had access to online health content through international and national electronic journals since 1999 and 2002, respectively. The provision of locally created health information for the general public began in 1998. All these services have been very effective. In 2005 a digital national open archive for scientific research, published within the country, was launched. These services are expected to continue over the next two years. A countrywide assessment of ICT use, conducted in 2004, has been very useful. The cost of access to medical databases has eventually been lowered, which had been one of the major challenges in this area. The tax on Internet access for households has also been reduced.

Capacity – human resources knowledge and skills

ICT skills courses as a part of university curricula for health sciences students have been offered since 1998 and ICT skills programmes in the ongoing training of health-care professionals since 2000. They have been rated as very effective and will be reviewed and continued over the next two years. There are plans to introduce health sciences courses through eLearning for health professionals (in training and practice) by 2008. The implementation of ICT courses as part of medical and postgraduate academic programmes is also considered an important step towards the adoption of international standards. However, shortage of instructors is posing a significant challenge, which is being addressed through systematic training.

eHealth tools and eHealth services

All of the listed eHealth tools are rated from very to extremely useful if the World Health Organization could offer these as generic prototypes for adaptation to Poland. The specified eHealth services are considered from moderately to extremely useful.
Russian Federation

Enabling environment – policies and strategies to support the information society

The Russian Federation reports that all of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken and they are expected to continue. The majority of these actions are considered moderately to very effective. Important initiatives are the consolidation of the work of chief scientists in the area of health computerization, and the establishment of medical informatics associations. The most effective actions initiated, include the federal programme ‘Electronic Russia,’ attracting non-budgetary sources of funding; and the participation of international organizations (which has attracted additional funding). Other important initiatives are the establishment of a committee for standardization within the area of ICT in health, and the creation of a testing centre for software used in health care. Ensuring the general public participation in the global open information society and the automation of resource management are reported as significant challenges.

Infrastructure – access to information and communication technologies

A national plan for the development of ICT in health was implemented in 2002, and intersectoral and nongovernmental collaboration was introduced in 1993. Both initiatives are rated as moderately effective and are expected to continue. There are plans to design a policy on affordability of infrastructure by 2008. The Russian Federation describes centralizing the compulsory medical insurance (OMC) system as the most effective action in building ICT infrastructure for the health sector. Standardization issues within the ICT field pose significant challenges.

Cultural and linguistic diversity, and cultural identity

The development of electronic multicultural health content is promoted in the Russian Federation through the introduction of multilingual projects, and support of translation and cultural adaptation. These actions were implemented in 1991 and are likely to continue. The development of Russian-language versions of international web sites is highlighted as another important initiative. The establishment of Russian-language electronic libraries is described as the most important action. However, ensuring access by Russian speakers to foreign sources of medical information remains a significant challenge.
Health professionals have had access to online health content through international and national electronic journals since 1995, and this service has been extremely effective. A policy for a digital national open archive for scientific research (published within the country) was implemented in 2002 and health information for the general public has been created and provided since 1999, the latter rated as a very effective initiative. These services are expected to continue over the next two years. The establishment of electronic medical libraries is expressed as the most important action in the field of extending access to the community.

Capacity – human resources knowledge and skills

ICT skills courses as a part of university curricula for health sciences students, introduced in 1973, have been very effective. ICT skills programmes in the ongoing training of health-care professionals have been offered since 1995 and are rated as slightly effective. Health sciences courses through eLearning for health professionals (in training and practice) were introduced in 2002 and are considered moderately effective. All these educational programmes are likely to continue over the next two years. The training of specialists is considered a challenge in the area of building ICT capacity in the health sector.

eHealth tools and eHealth services

General Practitioner Information Systems (GPIS) are rated as an extremely useful tool if the World Health Organization could offer these as a generic prototype for adaptation to the Russian Federation. The majority of remaining listed eHealth tools are rated very useful. Among the listed eHealth services, advice on methods for monitoring and evaluation of eHealth services, and advice on eLearning programmes are considered extremely useful. Participation in international conferences and fora for regular exchange of experiences are mentioned as additional activities that would be extremely useful.
Slovakia

Enabling environment – policies and strategies to support the information society

Slovakia reports that half of the actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken, the majority of them likely to continue over the next two years. The promotion of availability of information in local languages in the recognition of cultural diversity is likely to be introduced by 2008. There are, to date, no plans to introduce regulations to protect the privacy and security of patient data. The implementation, in 2004, of a national eStrategy, which sets out the vision and objectives to promote the use of ICT across all sectors, is described as the most important initiative; it is expected to stimulate action in legislature and the implementation of international standards. Slovakia notes, however, that due to reforms by the Ministry of Health in 2004–2005, the implementation of the actions related to eHealth policies (specified in the Strategy on Implementing the Information Society) have been postponed. The Institute of Health Information and Statistics has been appointed by the Ministry of Health to organize a board of experts – eHealth Committee – to elaborate a national road map for the development and implementation of eHealth programmes in Slovakia. Increased cooperation with other institutions is expected to follow.

Figure 1. Enabling environment for ICT in the health sector: actions taken or planned within 2 years and their effectiveness rating

Infrastructure – access to information and communication technologies

A national policy to reduce the costs of ICT infrastructure for the health sector will be implemented in 2006. Currently, no decision has been made as to which of the remaining listed actions in improving access to information and communication technologies in the health sector will be taken over the next two years.

Figure 2. ICT infrastructure development for the health sector: actions taken or planned within 2 years and their effectiveness rating

Cultural and linguistic diversity, and cultural identity

At this stage, none of the specified actions to promote the development of electronic multicultural health content have been taken.

Figure 3. Electronic multicultural health content: actions taken or planned within 2 years and their effectiveness rating
Content – access to information and knowledge

Health professionals have had access to online health content through international and national electronic journals since 1997 and 1998, respectively. Provision of locally created health information for the general public commenced in the 1990s. These services have been moderately to very effective and will be reviewed and continued over the next two years. A digital national open archive or repository for scientific research (published within the country) was launched in 2003 and is likely to continue. The national medical bibliography, Bibliographia Medica Slovaca, is highlighted as an important initiative to provide professionals with online access to health content. Slovakia reports the creation of a number of health-related web sites established by health institutions as the most effective action in this field, along with the initiative providing health-related web sites to the general public. A consortium of Slovak libraries has been created (project eIFL), to provide access to medical databases at affordable rates.

Capacity – human resources knowledge and skills

ICT skills courses as a part of university curricula for health sciences students and ICT skills programmes in the ongoing training of healthcare professionals have been slightly effective and will be reviewed and may be continued over the next two years. There are plans to introduce health sciences courses through eLearning for health professionals (in training and practice) by 2008.
Switzerland reports that the majority of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector will be taken in the next two years. A national information policy, implemented in 1998, is rated as slightly effective and will be reviewed and continued. Recognition of cultural diversity through the provision of information in local languages is promoted historically based on the constitution of 1291. It points out that patient privacy is incorporated within the National Health Insurance Act, however, legislation is not specific to eHealth. An important initiative to promote an enabling environment for ICT is the federal medical tariff system, TarMed, which, while providing comprehensive coverage of ICT infrastructure, is not specific to eHealth. Management and funding are shared by the federal and cantonal health care systems. Switzerland refers to its distinctly federal state organization with many actors and complex administrative processes, and points out that significant efforts to develop eHealth are undertaken at a local, cantonal and private sector levels. The current updating of the Swiss Information Society Strategy by the Government was complemented by a national conference on eHealth (2004). The revised Information Society Strategy, expected to be accepted by 2006 by the Bundesrat, will act as a framework strategy that will explicitly address eHealth and the need to develop a national eHealth strategy. The Swiss Federal Office of Public Health (BAG) has commenced preparations according to the revised strategy and initiatives initiated ‘Taskforce eHealth’.

Infrastructure – access to information and communication technologies

A national plan for the development of ICT in health is likely to be implemented in the next two years. There are currently no plans to introduce a policy on affordability of infrastructure. Intersectoral and nongovernmental collaboration commenced in 2005 and is likely to be reviewed and continued. Important initiatives are the Swiss National Health Insurance Act and the health insurance card, which has the potential to be developed into an electronic health card (smart card). Investments have been made in the administrative areas of infrastructure for eHealth. A significant challenge is to provide scientific evidence and evaluation on the benefits of ICT for health.

Cultural and linguistic diversity, and cultural identity

The development of electronic multicultural health content is promoted in Switzerland through the introduction of multilingual projects, and support of translation and cultural adaptation. These initiatives are considered very effective and will continue. According to Switzerland’s constitution, any social programme must take cultural and linguistic diversities into consideration. The Swiss Federal Office of Public Health provides public health information on its web site in German, French, Italian and English. The English language taking over as the new ‘lingua franca’ is described as a challenge in the area of ICT.
Content – access to information and knowledge

Health professionals have had access to online health content through international and national electronic journals since 1990. The creation and provision of health information for the general public in electronic format began in 1995. These services are likely to be reviewed and continued. There are plans to introduce a policy for a digital national open archive for scientific research by 2008. Swiss Academies and University libraries promote an ‘Open Archive Initiative’. The following is offered in German, French, Italian and English on the BAG web site: information on prevention and monitoring (influenza, severe acute respiratory syndrome, HIV/AIDS, drugs and addiction, chemical and radiation hazards); electronic forms to report diseases subject to registration; and access to databases for ongoing epidemics in Switzerland. The most important actions to promote access to electronic health content are described to be mainly due to academic or private sector initiatives. Lack of scientific evaluation of the various aspects linked to the use of electronic health content is reported to pose a significant challenge.

Capacity – human resources knowledge and skills

ICT skills programmes in the ongoing training of health-care professionals will be introduced in the next two years. Health sciences courses through eLearning for health professionals (in training and practice) have been offered since 2000. A decision has yet to be made as to whether this programme will continue as it has not received a positive evaluation. Medical eLearning courses are being supported through the national initiative ‘Swiss Virtual Campus’ (e.g. Computers for Health). Health professionals’ associations also offer online courses in the ongoing training of health professionals. There is, however, no educational plan for health care activities at the national level. Switzerland notes the need for an overall eHealth blueprint in the area of building ICT capacity in the health sector.

eHealth tools and eHealth services

The majority of the listed eHealth tools are rated from very to extremely useful if WHO could offer these as generic prototypes for adaptation to Switzerland. ‘Telehomecare’ is mentioned as an additional tool that would be extremely useful. The majority of the specified eHealth services are also considered very to extremely useful.

<table>
<thead>
<tr>
<th>Effectiveness</th>
<th>Future action</th>
<th>Usefulness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely effective</td>
<td>C</td>
<td>5</td>
</tr>
<tr>
<td>Very effective</td>
<td>RC</td>
<td>4</td>
</tr>
<tr>
<td>Moderately effective</td>
<td>S</td>
<td>3</td>
</tr>
<tr>
<td>Slightly effective</td>
<td>P</td>
<td>2</td>
</tr>
<tr>
<td>Not effective</td>
<td>U</td>
<td>1</td>
</tr>
<tr>
<td>Unknown effectiveness</td>
<td>O</td>
<td>0</td>
</tr>
<tr>
<td>Start date unknown</td>
<td>No-data</td>
<td>0</td>
</tr>
<tr>
<td>No data</td>
<td>*</td>
<td>0</td>
</tr>
</tbody>
</table>

* per 100 inhabitants
Turkey

Enabling environment – policies and strategies to support the information society

Turkey reports that the majority of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector have been taken. Most are rated as very effective and are likely to be reviewed and continued over the next two years. Provision of public funding for ICT support of programmes addressing national health priorities will start by 2008. The remainder of the listed actions have not been implemented at this stage and no decision has been made as to which of them will be introduced. Turkey highlights the implementation of the National Health Information System project in 2003 under the Ministry of Health as a significant action. Ten working groups comprising members from governmental institutions, the private sector, nongovernmental organizations, universities, and social partners conducted inter alia an assessment of the technological situation within their respective fields. The eHealth Working Group, coordinated by the Ministry of Health and developed in the context of ‘eTransformation Turkey’, has developed modules of eHealth services. Turkey’s eHealth Project Proposal, prepared by the Health Transformation Programme and eTransformation Turkey has been accepted by the International Telecommunications Union. As a further step Turkey’s eHealth Implementation Plan has been developed. To meet the various challenges in this area Turkey wishes to create a department for ICT and health within the Ministry of Health.

Infrastructure – access to information and communication technologies

The implementation in 2001 of a national plan for the development of ICT in health, which sets targets for health sector connectivity, is reported to be very effective and will likely be reviewed and continued. A policy on affordability in infrastructure for the health sector was introduced in 2003, and intersectoral and nongovernmental cooperation to promote infrastructure development commenced the same year. These initiatives are rated as very effective and will continue. The introduction of asymmetric digital subscriber lines (ADSL) by Turkish Telecom is described to be the most effective action to build infrastructure for ICT in the health sector. This has reduced the cost of connectivity overall, and enabled family physicians to access the Family Medicine Information System as part of the Health Transformation Programme.

Cultural and linguistic diversity, and cultural identity

To date, none of the specified actions to promote the development of electronic multicultural health content have been implemented and a decision remains to be made as to which actions will be taken in the next two years.
Content – access to information and knowledge

Health professionals have had access to online health content through international and national electronic journals since 1999 and 2002, respectively. The former is rated as very effective and will continue over the next two years. The latter is also rated as very effective, and will be reviewed. In 2002, a digital national open archive for scientific research (published within the country) was launched and is rated as a moderately effective service. The creation and provision of health information for the general public in electronic format began in 2000. Both these services are likely to be reviewed and continued.

Capacity – human resources knowledge and skills

ICT skills courses as a part of university curricula for health sciences students have been offered since 2003 and ICT skills programmes in the ongoing training of health-care professionals since 2000. These educational programmes are rated as moderately effective and will be reviewed and continued. There are plans to introduce health sciences courses through eLearning for health professionals (in training and practice) by 2008.
The United Kingdom of Great Britain and Northern Ireland reports that it has taken all but one of the listed actions to promote an enabling environment for information and communication technologies (ICT) in the health sector. These actions are expected to continue. It highlights the strategic review of health care provision, 'Securing our Future Health: Taking a Long-Term View – the Wanless Review’. This led to the launch of the National Programme for information technology (IT) in the National Health Service (NHS), a programme spanning over 10 years, which created a national information infrastructure to support health care delivery in England. Key success factors were a centrally led and managed procurement process, coupled with secure funding specifically for ICT investment. Similar actions specific to Scotland, Wales and Northern Ireland are being developed. One of the most significant challenges has been securing public and professional confidence in the information governance arrangements and privacy and confidentiality measures around holding and processing sensitive health information electronically. This has been dealt with through extensive consultation with the public and health professionals, and maintaining transparent policies regarding the use of health data. A framework for information governance has been established, developed in full consultation with health-care professionals (arising out of the Caldicott review, all NHS bodies have senior clinicians appointed to oversee the confidentiality of patient data). The National Programme for IT infrastructure (see above) is being implemented with rigorous security measures including the use of smartcards for health-care professionals and mechanisms for patients to define what information they wish to be shared and under what circumstances.

Infrastructure – access to information and communication technologies

The listed actions, implemented in 2002, are rated as extremely effective and likely to continue. The above-mentioned Wanless Review is noted as an important initiative in this field. A significant challenge has been the scale and complexity of the health care delivery process, identifying the needs of a large and diverse community of users who work in many different organizations, from large teaching hospitals to single-handed general practitioner practices. This has been met in England by a centrally managed procurement process. The National Programme for IT in England consists of specific procurement criteria based on the formal Official Journal of European Union (OJEU) process: only major suppliers who could demonstrate proven ability to deliver a programme on this scale were selected; a clear set of requirements and scope for implementation were provided; rigorous testing of technical and interoperability standards occurred; adopting a service-provision strategy whereby the technical support arrangements are the responsibility of the supplier, not the NHS. The other countries of the United Kingdom (that have devolved responsibility for health care provision) are making separate arrangements.

Cultural and linguistic diversity, and cultural identity

Special projects were introduced in 1998 to develop multilingual electronic health content. NHS Direct Online (http://www.nhsdirect.nhs.uk) is highlighted as a key action and although it is an English-language site, NHS Direct and local NHS organizations provide translation facilities for patients on request. This is considered the most cost-effective approach. NHS Direct Online is also currently developing quality assured, evidence-based, health information leaflets in English and 12 other languages. Supporting minority languages (especially non-European) and providing health advice in an appropriate cultural context poses a significant challenge.
Content – access to information and knowledge

The specified actions to promote access to electronic health content were implemented in 1998, rated from very to extremely effective and are expected to continue. The most effective action is described as being the establishment of ‘NHS Direct Online’ as a complementary service to the ‘NHS Direct’ telephone advice service. Success factors include: promoting it under the trusted NHS ‘brand’ as a quality assured source of high-quality information; central funding and provision of resources; building on well-established and trusted pilot projects; working closely with a wide network of academic, private and voluntary sector information providers; implementation as part of an integrated set of services for public health information including telephone advice service and digital TV service, as well as linking it to the national knowledge service component of the National Programme for IT. Similar actions specific to Scotland, Wales and Northern Ireland are being developed. The most significant challenge has been to ensure that publicly accessible health information is of the highest quality and wholly consistent with best clinical practice. This has been met by ensuring that the information is clearly presented as part of the overall NHS health care provision, and that all information provided is sourced by accredited clinical professionals and has gone through rigorous clinical review.

Capacity – human resources knowledge and skills

ICT capacity has been built by the implementation of the listed educational programmes since 1998. These programmes are expected to continue over the next two years. The most effective action has been the creation of the NHS University (NHSU). The NHS currently invests over £3 billion a year on education and training for its staff. NHSU provides learning opportunities for NHS staff and other caregivers by creating learning environments throughout the sector, and will therefore be a major contributor to the implementation of the NHS Plan, to the modernization of social care, and to the nation’s ‘Skills Strategy’.

eHealth tools and eHealth services

Telehealth and Geographical Information Systems are rated as moderately useful if the World Health Organization could offer these as generic prototypes for adaptation to the United Kingdom of Great Britain and Northern Ireland. The majority of the specified eHealth services are considered moderately useful.
Report of the WHO Global Observatory for eHealth