# eHealth TOOLS&SERVICES

## Needs of the Member States

Report of the WHO Global Observatory for eHealth

World Health Organization

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# Contents



WHO emergency response team member collecting surveillance data and transmitting it to headquarters after the devastating earthquake in Pakistan in October 2005.

# Executive summary

The Global Observatory for eHealth (GOe) was established by the World Health Organization (WHO) in 2005. As its initial task it carried out the first global survey on eHealth. The survey covered seven key themes in the eHealth domain and one of these is the subject of this report. The full survey results will be published in the Annual Report of the Global Observatory for eHealth in May 2006.

This report summarizes the needs for eHealth tools and services of the WHO Member States and their expectations from the WHO Secretariat as expressed in the survey. It is targeted at policy makers, eHealth practitioners, researchers and academics.

# Key findings

The survey found that:

- active involvement of WHO in the development of generic eHealth tools, and guidance in creating and implementing eHealth services would be welcomed by Member States;
- the need for guidance in a broad range of eHealth areas was expressed in particular by countries that do not belong to the Organisation for Economic Co-operation and Development (OECD);[1]
- OECD countries did not express consistent views of their needs in eHealth areas; and
- there is a need to raise awareness as to what eHealth tools and services already exist at global and national levels.

# Proposed action

It is therefore recommended that WHO, in collaboration with public and private sector partners, should take action in the following key areas:

### *Provision of generic tools*

WHO should facilitate the development of those generic eHealth tools most sought after by its Member States including:

- tools for monitoring and evaluation of eHealth services;
- drug registries;
- institutional patient centred information systems that could be extended to include electronic health record systems; and
- directories of health care professionals and institutions.

### *Access to existing tools*

As a parallel and complementary action, electronic directories of existing eHealth tools and services should be created with an emphasis on open source solutions.

### *Facilitating knowledge exchange*

An international knowledge exchange network to share practical experiences on the application and impact of eHealth initiatives should be built. This would be Internet based and could be complemented by international eHealth conferences to facilitate networking.

### *Providing eHealth information*

WHO should create a digital resource of eHealth information to support the needs of Member States in key areas such as eHealth policy, strategy, security and legal issues.

### *Education*

The use of eLearning programmes for professional education should be promoted in the health sciences as well as in ongoing professional development. Collaborations should be developed to generate databases of existing eLearning courses. WHO should advocate for the inclusion of eHealth courses within university curricula.

1 For statistical reasons, responding countries were grouped by OECD/non-OECD membership. http://www.oecd.org



# First global survey on eHealth

## Introduction

*At its Fifty-eighth Session in May 2005, the World Health Assembly (WHA) adopted resolution WHA58.28 establishing an eHealth Strategy for the World Health Organization. The resolution urged Member States to plan for appropriate eHealth services in their countries. It also recognized that a WHO eHealth strategy would serve as a basis for WHO's activities in eHealth and requested the Director-General to submit to the 117th Session of the Executive Board (EB) an action plan, including budgetary implications, aimed at the use of eHealth tools and services for implementation by Member States.*

eHealth, the use of information and communication technologies (ICT) for health, is one of the most rapidly growing areas in health today. However, limited systematic research has been carried out to inform eHealth policy and practice. It is for this reason that WHO, through its newly created Global Observatory for eHealth (GOe), undertook a world-wide survey on eHealth. The findings provide an important first measure of eHealth capacity in Member States as well as their current and most important needs. With this global picture, these data will be used for comparison with those of further studies. They will also help WHO tailor its support and guidance to match the immediate needs of its Member States in the area of eHealth.

All WHO Member States were strongly encouraged to participate in the survey. At the time of printing, 93 countries had responded, which represents a response rate of 48%.[2] The GOe secretariat was encouraged by the response rate, especially given it was the first survey of its kind, and the short time frame in which it was conducted. It is anticipated that the response rate to future surveys will increase significantly over the next three years as the GOe raises its international profile and further develops its collaboration with Member States.

## Global Observatory for eHealth

Established in early 2005, the GOe is a significant new WHO initiative; it reflects the Organization's recognition of the emerging importance of the use of ICT for health systems and services.

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

- provide timely and high-quality evidence and information to help national governments and international bodies improve policy, practice and management of eHealth services;
- raise awareness and commitment of governments and the private sector to invest in, and advance, eHealth;
- collect, analyse and distil eHealth-related knowledge, which will significantly contribute to the improvement of health using ICT; and
- disseminate research findings through publication of the GOe Annual Report on key eHealth research topics as a reference for governments and policy-makers as well as theme-based reports on special topics.

The GOe operates within the eHealth unit of the Department of Knowledge Management and Sharing (KMS) at WHO in Geneva. As a networked, decentralized operation, membership of the secretariat includes at least one coordinator from all six WHO regions and three staff members from headquarters. Fifteen experts at headquarters have been invited to contribute to various tasks of the GOe through working groups. Project planning and implementation occurs mainly through regular teleconferences to ensure active involvement of all WHO regions.

Operations and collaborations began expanding in mid-2005 to include research centres, national and regional eHealth observatories and other operationally significant partners across the globe. A Strategic Advisory Group of Experts (SAGE) was created and consists of international eHealth experts in industry, research fields, academia and practice. This group will provide ongoing high-level strategic guidance to the Observatory.

2 The Annual Report of the GOe will contain all country responses including those received after the publication of this report.

## Survey process

As this was the first survey of the Global Observatory for eHealth, and indeed the first WHO global survey on eHealth, it focused on issues relating to processes and outcomes in key eHealth action lines previously identified by the World Summit on the Information Society[3] (WSIS) and supported by the WHO.

The survey instrument was developed in collaboration with eHealth professionals from the WHO regional offices and headquarters, Geneva. It was piloted in Jordan and the Democratic Republic of the Congo, before being circulated globally.

It aimed to:

- describe and analyse eHealth profiles in countries, regions and internationally;
- identify and evaluate measures taken in key action areas to support the development of eHealth in countries; and
- establish the usefulness of WHO providing generic eHealth tools and services for Member States.

The survey covered the following seven themes:

| Theme | Action |
|---|---|
| Enabling environment | Create an enabling environment for the development of eHealth through policy. |
| Infrastructure | Develop infrastructure in a health context. |
| Content | Provide access for health professionals and the community to digital health content. |
| Cultural and linguistic diversity | Produce and disseminate multicultural digital health content. |
| Capacity | Build ICT knowledge and skills in the health sector. |
| National centres for eHealth | Expand the eHealth international network. |
| eHealth systems and services | Query and respond to Member States' requirements for eHealth tools and services. |

Table 1. Survey themes

The survey was carried out in six stages, which are described in Table 2. Surveys were completed at country level by teams of three to five key informants, although some countries selected up to ten experts to contribute. Survey meetings were held so that the questions could be discussed and answered by all informants. Where there were differences of opinion, the survey facilitator would request that the group reach a consensus. Meetings lasted four to eight hours.

The survey instrument, guidelines and glossary of survey and eHealth terms were provided in the six official United Nations (UN) languages.

3 http://www.itu.int/wsis/

| Stage | Activity | Comments |
|---|---|---|
| 1 | GOe headquarters distributed surveys and briefed regional coordinators. | Regional coordinators provided with translated survey instruments, procedures and timelines. |
| 2 | Country coordinators briefed. | WHO regional coordinators worked directly with country coordinators and liaison officers to advise them of the process; survey materials provided. |
| 3 | Country coordinators selected key informants and sent survey materials. | Country coordinators given guidelines to assist with the selection of key informants.<br>(In some countries it did not prove difficult to find appropriate experts. In others, particularly where eHealth is not yet advanced, it was more challenging.) |
| 4 | Informants conducted research prior to taking the survey. | Informants given two weeks to conduct the background research required to complete the survey. |
| 5 | Survey meetings held. | Key informants met in countries; meetings lasted between four hours and one day.<br>Sessions facilitated by administrator.<br>Endorsement by WHO representative or designated officer required before survey returned to WHO for quality control and to ensure that specified survey guidelines were met. |
| 6 | Completed surveys returned to WHO. | 93 responses were received by the time of publication. |

Table 2. GOe survey process

Scientist studying a malaria mosquito and transmitting data to other laboratories in Tunisia.

# Data analysis

The information contained in this report is based on the country responses to the following questions on eHealth tools and services:

*Please rate the following list of* **eHealth tools** *on the basis of how useful they would be if WHO could offer generic prototypes for adaptation by your country.*

- Electronic Health Records (eHR)
- Patient Information Systems (PIS)
- Hospital information Systems (HIS)
- General Practitioner Information Systems (GPIS)
- National electronic registries
- National drug registries
- Directories of healthcare professionals and institutions
- Decision Support Systems (DSS)
- Telehealth
- Geographical Information Systems (GIS)
- Other, please specify

*Which of the following* **eHealth services** *does your country require from WHO and please grade their usefulness.*

- Advice on national needs assessment for eHealth
- Advice on eHealth policy and strategy
- Advice on methods for monitoring and evaluation of eHealth services
- Information on effective/best eHealth practices
- Advice on eHealth norms and standards
- Information on trends and developments in eHealth
- Advice on eLearning programmes
- Advice on human resources development for eHealth
- Other, please specify

Data from the completed surveys were processed on a question-by-question and country-by-country basis. Additional secondary data were obtained from sources such as WHO Health Systems Financing, World Bank, United Nations Conference on Trade and Development (UNCTAD) and OECD to investigate correlations based on internationally recognized parameters. In order to establish a basis for analysis, correlations were made between the responses and various country characteristics. These included GDP per capita, the UNCTAD ICT Diffusion Index, and membership in OECD. It was decided to group countries according to OECD/non-OECD membership as this provided the clearest separation to the responses and allowed for meaningful statistical analysis.

The analysis below follows the structure and sequence of the questionnaire. For each survey question there is a definition of the tool or service, a description of the most important findings and the mean, median and mode score.[4]

The usefulness indicator for each eHealth tool or service is taken as being the mode point. It is represented by bars in each table (Figure 1).

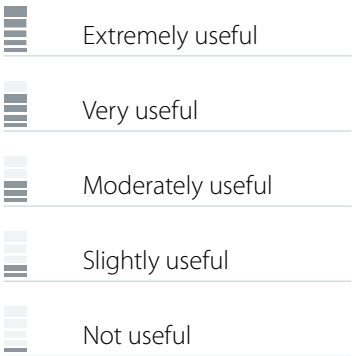



**Figure 1. Usefulness levels and indicators**

4 Mean: average value; median: value in the middle range; mode: most frequently occurring value.




# Results

## Responses

At the time of publication 93 countries had responded, which represents a response rate of 48% and covers 65% of WHO Member States' population (see Annex for list of countries).

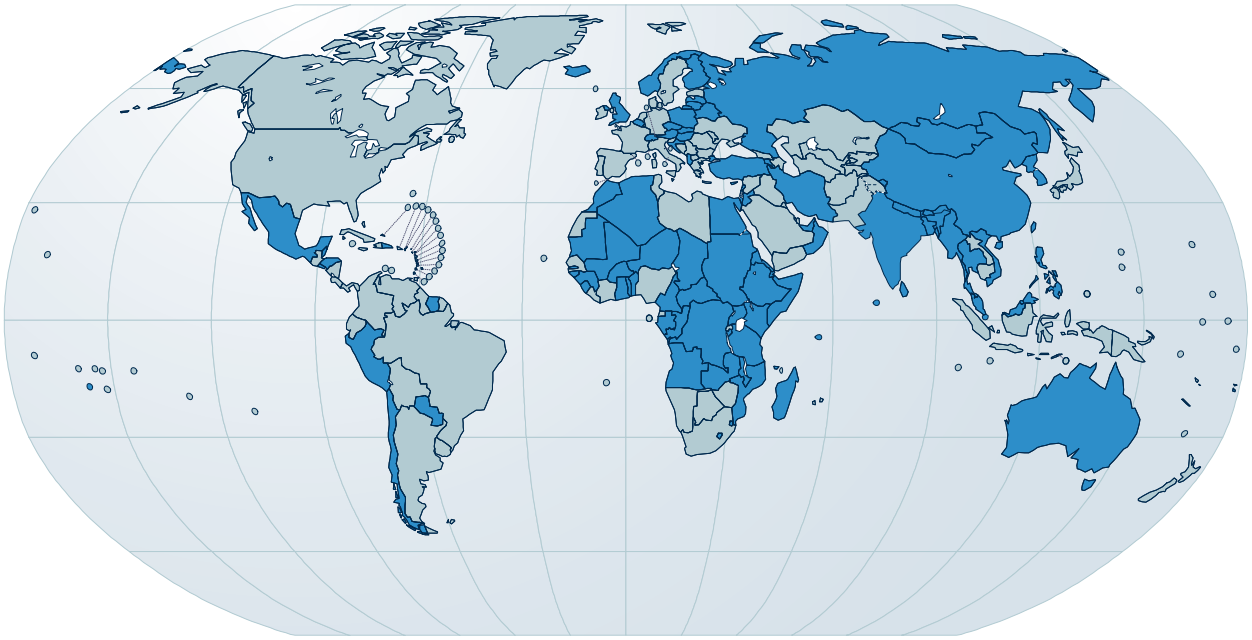


Figure 2. Responding countries

A number of factors may have affected the response rate: some countries found the deadline for completion too tight to meet; the timing of the survey coincided with summer in the northern hemisphere making it difficult to plan national meetings; and in some countries eHealth is still in the early stages of development. Since 84% of the responding countries were non-OECD members, this introduces a certain level of bias in the sample.

# Data summary

The number of responses received and the calculated mode for each survey question is shown below. Responding countries were grouped by membership in the OECD (Table 3). Table 4 shows the responses by WHO region.[5]

| eHealth tools | Non-OECD | | OECD | |
|---|---|---|---|---|
| | Responses | Mode | Responses | Mode |
| Electronic Health Records (eHR) | 78 | 4 | 14 | 5 |
| Patient Information Systems (PIS) | 77 | 4 | 14 | 5 |
| Hospital information Systems (HIS) | 77 | 4 | 14 | 2 |
| General Practitioner Information Systems (GPIS) | 78 | 4 | 13 | 2 |
| National electronic registries | 78 | 4 | 14 | 3 |
| National drug registries | 77 | 4 | 14 | 4 |
| Directories of health care professionals and institutions | 77 | 4 | 13 | 5 |
| Decision Support Systems (DSS) | 78 | 4 | 14 | 4 |
| Telehealth | 78 | 5 | 14 | 4 |
| Geographical Information Systems (GIS) | 77 | 5 | 14 | 3 |
| eHealth services | | | | |
| Advice on national needs assessment for eHealth | 76 | 4 | 14 | 3 |
| Advice on eHealth policy and strategy | 76 | 4 | 14 | 3 |
| Advice on methods for monitoring and evaluation of eHealth services | 74 | 4 | 13 | 4 |
| Information on effective/best eHealth practices | 78 | 4 | 14 | 5 |
| Advice on eHealth norms and standards | 75 | 4 | 14 | 4 |
| Information on trends and developments in eHealth | 78 | 4 | 13 | 4 |
| Advice on eLearning programmes | 77 | 4 | 14 | 3 |
| Advice on human resources development for eHealth | 77 | 4 | 14 | 3 |

Table 3. Analysis of the country responses to the GOe survey, grouped by membership in the OECD

5 See Annex for list of WHO regions.

| eHealth tools | African Region (33*) | | Region of the Americas (9*) | | South-East Asia Region (9*) | | European Region (21*) | | Eastern Mediterra-nean Region (10*) | | Western Pacific Region (11*) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Responses | Mode | Responses | Mode | Responses | Mode | Responses | Mode | Responses | Mode | Responses | Mode |
| Electronic Health Records (eHR) | 33 | 4 | 9 | 5 | 9 | 4 | 21 | 5 | 10 | 5 | 10 | 5 |
| Patient Information Systems (PIS) | 33 | 4 | 8 | 5 | 9 | 4 | 21 | 5 | 10 | 5 | 10 | 5 |
| Hospital information Systems (HIS) | 32 | 5 | 9 | 4 | 9 | 4 | 21 | 4 | 10 | 5 | 10 | 5 |
| General Practitioner Information Systems (GPIS) | 33 | 4 | 9 | 4 | 9 | 4 | 20 | 2 | 10 | 5 | 10 | 5 |
| National electronic registries | 33 | 4 | 9 | 5 | 9 | 4 | 21 | 4 | 10 | 5 | 10 | 5 |
| National drug registries | 33 | 5 | 9 | 5 | 8 | 4 | 21 | 4 | 10 | 5 | 10 | 4 |
| Directories of healthcare professionals and institutions | 32 | 4 | 9 | 5 | 9 | 4 | 20 | 4 | 10 | 5 | 10 | 4 |
| Decision Support Systems (DSS) | 33 | 4 | 9 | 5 | 9 | 4 | 21 | 4 | 10 | 5 | 10 | 4 |
| Telehealth | 33 | 5 | 9 | 5 | 9 | 4 | 21 | 3 | 10 | 5 | 10 | 5 |
| Geographical Information Systems (GIS) | 33 | 5 | 9 | 5 | 8 | 5 | 21 | 4 | 10 | 5 | 10 | 3 |
| eHealth services | | | | | | | | | | | | |
| Advice on national needs assessment for eHealth | 32 | 5 | 9 | 4 | 8 | 4 | 20 | 4 | 10 | 5 | 11 | 5 |
| Advice on eHealth policy and strategy | 33 | 4 | 8 | 4 | 8 | 4 | 20 | 3 | 10 | 4 | 11 | 5 |
| Advice on methods for monitoring and evaluation of eHealth services | 32 | 4 | 8 | 4 | 8 | 4 | 19 | 4 | 10 | 4 | 10 | 5 |
| Information on effective/best eHealth practices | 33 | 4 | 9 | 4 | 9 | 4 | 19 | 4 | 10 | 4 | 11 | 4 |
| Advice on eHealth norms and standards | 32 | 4 | 8 | 4 | 8 | 4 | 19 | 4 | 10 | 5 | 11 | 5 |
| Information on trends and developments in eHealth | 33 | 4 | 9 | 4 | 9 | 4 | 19 | 4 | 10 | 4 | 10 | 4 |
| Advice on eLearning programmes | 33 | 5 | 9 | 3 | 8 | 4 | 19 | 3 | 10 | 5 | 11 | 4 |
| Advice on human resources development for eHealth | 33 | 5 | 9 | 4 | 9 | 4 | 19 | 4 | 9 | 5 | 11 | 4 |

**Table 4. Summary of responses to the GOe survey, by WHO region**

* Total number of responding countries per WHO region.

## eHealth tools

Figures 3 and 4 illustrate the responses of the non-OECD and OECD countries. The x-axis represents eHealth tools options. The y-axis indicates the percentage response and the level of usefulness as identified by responding countries.

Over 70% of non-OECD countries rated all eHealth tools as either *very useful* or *extremely useful* (Figure 3).

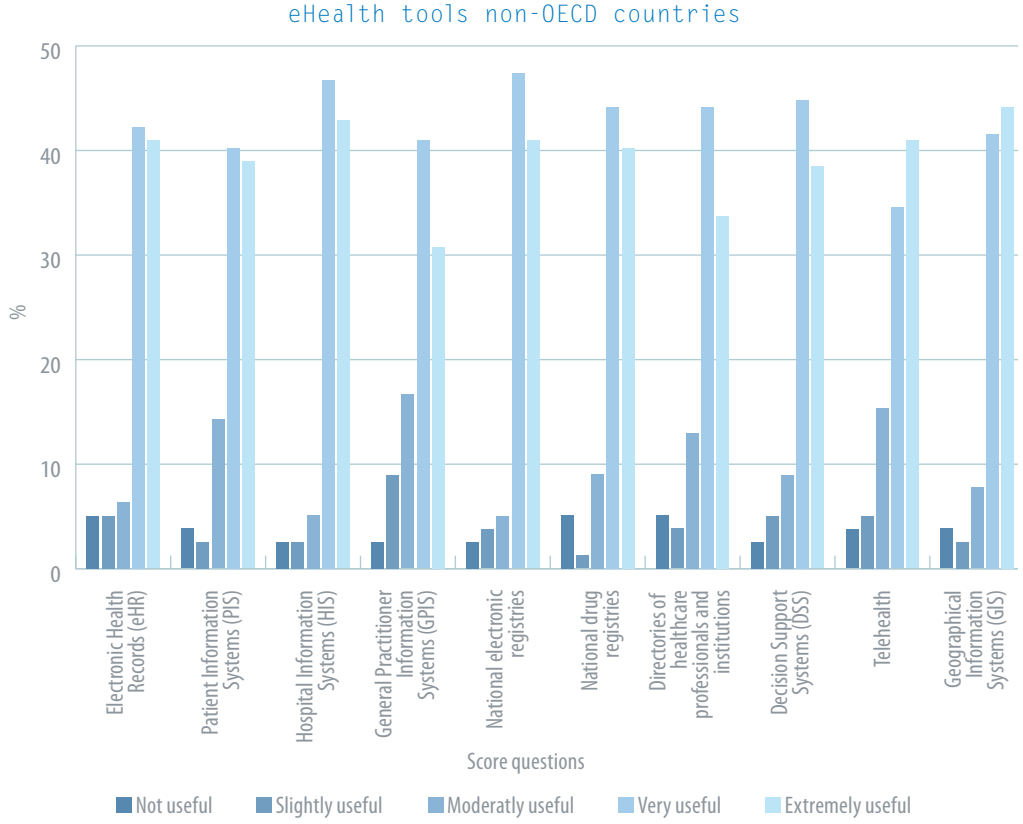



**Figure 3. eHealth tools non-OECD countries**

Technicians erecting VSAT dishes in Islamabad, Pakistan, to provide the vital satellite health communications links required between WHO headquarters and the field.

All eHealth tools with the exception of GPIS and GIS were rated by at least 50% of OECD countries as either *very useful* or *extremely useful*. GPIS and GIS were rated by 46% and 36% respectively as *very useful* or *extremely useful* (Figure 4).

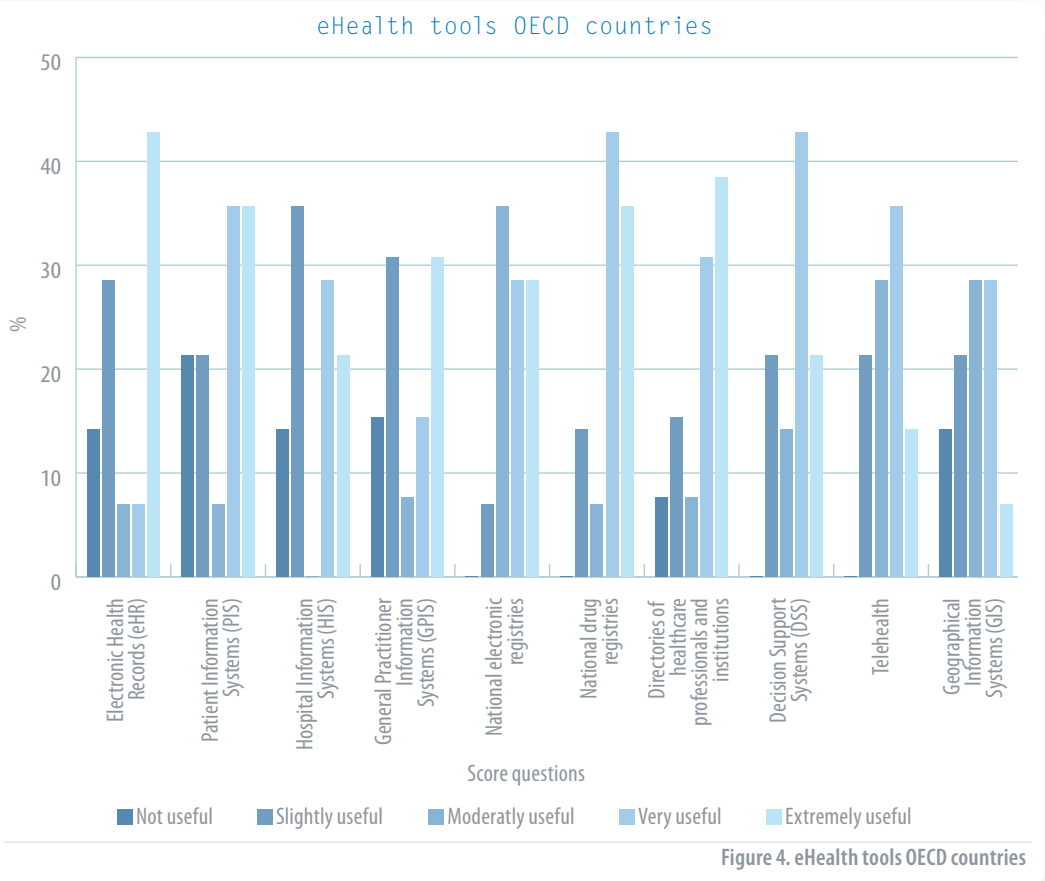



**Figure 4. eHealth tools OECD countries**

WHO Operations Centre
Islamabad, Pakistan.

Results are presented in the following format:

- a definition or description of the eHealth tool;
- an analysis of the response; and
- a table of aggregated data indicating the mean, median and mode values.

## Electronic Health Records

***Also called Electronic Medical Records (eMR), Electronic Health Records (eHR) of a patient's clinical history are used to support clinical actions by health professionals. They include information such as test results, medication and general clinical history. They can be made rapidly available through ICT to authorized personnel providing patient care.***

Table 5 indicates that eHR would be *very useful* for non-OECD countries and *extremely useful* for OECD countries. It should be noted, however, that there is a significant disparity between the numbers for OECD countries.

| | RESPONSES | MEAN | MEDIAN | MODE |
|---|---|---|---|---|
| Non-OECD | 78 | 4.09 | 4 | 4 |
| OECD | 14 | 3.36 | 3.5 | 5 |

**Table 5. Electronic Health Records**

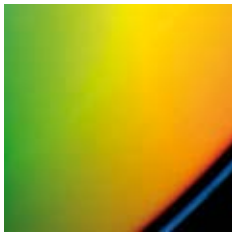
## Patient Information Systems

***Patient Information Systems (PIS) contain information about a hospitalized patient and are used to support both the administrative and clinical activities in a hospital. They are usually hospital-wide, but may be restricted to single or multiple departments. They do not usually contain multimedia data distinguishing them from an electronic health record system. They contain numeric and textual data about the patient in addition to the basic administrative data, which distinguishes them from hospital information systems.***

Non-OECD countries indicated that they would find a generic tool for Patient Information Systems *very useful*. OECD countries were less consistent in their answers but overall scored PIS as *extremely useful* (Table 6).

| | RESPONSES | MEAN | MEDIAN | MODE |
|---|---|---|---|---|
| Non-OECD | 77 | 4.08 | 4 | 4 |
| OECD | 14 | 3.31 | 3.5 | 5 |

**Table 6. Patient Information Systems**



## Hospital Information Systems

***Computer-based information systems that support information processing within a hospital in areas such as administration, appointments, billing, planning, budgeting and personnel.***

Table 7 shows that non-OECD countries would find it *very useful* to have a generic Hospital Information System (HIS) provided by WHO. OECD countries were less consistent and generally inclined to find it *slightly useful*. This may be explained by the fact that the majority of hospitals in these countries already have some form of HIS installed.

| | RESPONSES | MEAN | MEDIAN | MODE |
|---|---|---|---|---|
| Non-OECD | 77 | 4.25 | 4 | 4 |
| OECD | 14 | 3.07 | 3 | 2 |

Table 7. Hospital Information Systems

## General Practitioner Information Systems

***ICT-based systems that support the work of a general practitioner (GP)/primary health care practitioner are called General Practitioner Information Systems (GPIS). The variation in health care models makes functions required by countries quite different. Where the GP is part of a primary health care team the system may also be known as a Primary Care Information System. Their prime functions are to manage and share data about patients. They often link to other health care systems such as billing, GP reimbursement or laboratory results reporting systems.***

There was strong indication that non-OECD countries would find it *very useful* to have generic GPIS provided by WHO. OECD countries were less consistent and generally inclined to find it *slightly useful* (Table 8). This may be because many of these countries already have programmes for equipping their GPs with computerized information systems.

| | RESPONSES | MEAN | MEDIAN | MODE |
|---|---|---|---|---|
| Non-OECD | 78 | 3.88 | 4 | 4 |
| OECD | 13 | 3.15 | 3 | 2 |

Table 8. General Practitioner Information Systems

## National electronic registries

***Electronic databases of related records on specific medical subjects. They contain data on births, mortality, cancer, diabetes or other subjects of medical or epidemiological interest. Registries can be accessed by authorized users through the use of ICT.***

Creation of generic national registries for diseases were reported as *very useful* by all non-OECD countries and *moderately useful* by OECD countries (Table 9).

| | RESPONSES | MEAN | MEDIAN | MODE |
|---|---|---|---|---|
| Non-OECD | 78 | 4.21 | 4 | 4 |
| OECD | 14 | 3.79 | 4 | 3 |

**Table 9. National electronic registries**

## National drug registries

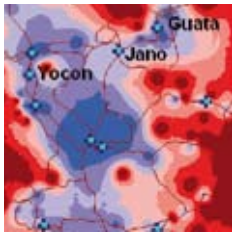
***Electronic databases containing national pharmaceutical information. The content varies depending on the purpose of the registry. Examples include databases of risks of exposure to drugs during pregnancy and potential drug interactions.***

Table 10 shows that creation of a generic national drug registry was considered *very useful* by all responding countries. Access to these data can have a significant impact on burdened health care budgets.

| | RESPONSES | MEAN | MEDIAN | MODE |
|---|---|---|---|---|
| Non-OECD | 77 | 4.13 | 4 | 4 |
| OECD | 14 | 4 | 4 | 4 |

**Table 10. National drug registries**

Laboratory worker in Indonesia using ICT to record sample information and transmit results to the central hospital.


## Directories of healthcare professionals and institutions

***Electronic databases of individuals and institutions providing health care. These are usually searchable by location, specialization, professional association or credentials. They are often associated with registration and accreditation status.***

Creation of generic directories of health care professionals and institutions was considered *very useful* by the majority of non-OECD countries, with most OECD countries reporting that it would be *extremely useful* (Table 11).

| | RESPONSES | MEAN | MEDIAN | MODE |
|---|---|---|---|---|
| Non-OECD | 77 | 3.97 | 4 | 4 |
| OECD | 13 | 3.77 | 4 | 5 |

**Table 11. Directories of healthcare professionals and institutions**

## Decision Support Systems

***Automated or semi-automated systems that support decision-making in a clinical environment.***

Both country groupings reported that the provision of generic decision support tools would be *very useful* for the majority of respondents (Table 12).

| | RESPONSES | MEAN | MEDIAN | MODE |
|---|---|---|---|---|
| Non-OECD | 78 | 4.12 | 4 | 4 |
| OECD | 14 | 3.64 | 4 | 5 |

**Table 12. Decision Support Systems**

## Telehealth

***The use of ICT to either support the provision of health care or as an alternative to direct professional care. It encompasses telemedicine and the use of remote medical expertise.***

Table 13 shows that generic telehealth developments were seen by non-OECD countries as *extremely useful*. This may reflect a desire to supplement health care resources in less developed areas. The OECD countries found it *moderately* to *very useful*, possibly reflecting the fact that they have already established telehealth facilities.

| | RESPONSES | MEAN | MEDIAN | MODE |
|---|---|---|---|---|
| Non-OECD | 78 | 4.04 | 4 | 5 |
| OECD | 14 | 3.43 | 3.5 | 4 |

**Table 13. Telehealth**

## Geographical Information Systems

***Computer-based applications for capturing, integrating, analysing and displaying data related to geographic coordinates.***

Generic geographical information systems were regarded by non-OECD countries as *extremely useful*, however the response from OECD countries was less clear (Table 14).

| | RESPONSES | MEAN | MEDIAN | MODE |
|---|---|---|---|---|
| Non-OECD | 77 | 4.19 | 4 | 5 |
| OECD | 14 | 2.93 | 3 | 4 |

**Table 14. Geographical Information Systems**

WHO Strategic Health Operation Centre using ICT to share health information and coordinate WHO's emergency response after the Tsunami in December 2004.



## Other requests

This question allowed countries to express any further needs not already included in the survey. The comments made were mainly from non-OECD countries. Some of the requirements have been covered in other sections of this report, but their inclusion here reiterates their importance to the countries requesting these generic systems.

### Tools for professionals

- eLearning tools – especially those which provide interaction between the learner and instructer. There was also a specific request for eLearning on the topic of public health;
- a digital library (also called virtual library); and
- databases to support the use of evidence-based medicine.

### Tools to support health care provision

- telehomecare/telehealth support;
- remote diagnosis;
- radiology information system; and
- laboratory information system.

### Health care and financial administration

- financial information system;
- patient referral system; and
- access to funding for eHealth tools.

### Policy and population health care tools

- disease surveillance;
- health information system (this may be similar to a disease surveillance and reporting system);
- public health advisory information system;
- an integrated public health monitoring and advisory system;
- vaccination status reporting;
- national eHealth portal; and
- a global health information system (wider than national).

### Technical requirements

- basic generic systems on open source software;
- generic infrastructure tools;
- interoperability tools;
- standard methods in eHealth;
- meta-data models; and
- data mining tools.

### Tools for citizens

- personal health care information systems.

# eHealth services

Figures 5 and 6 illustrate the responses of the non-OECD and OECD countries. The x-axis represents eHealth services options. The y-axis indicates the percentage response and the level of usefulness as identified by responding countries.

Over 65% of non-OECD countries rated eHealth services as either *very useful* or *extremely useful* (Figure 5).

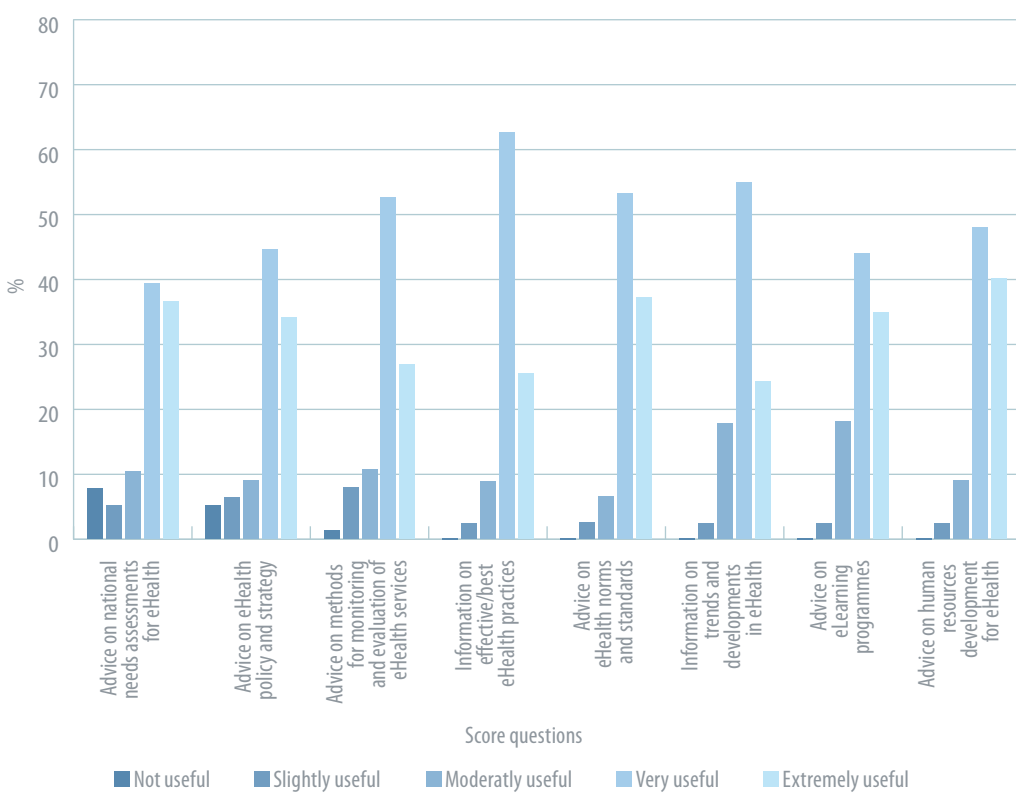



**Figure 5. eHealth services non-OECD countries**

All eHealth services were rated by over 60% of OECD countries as either *moderately*, *very* or *extremely useful* (Figure 6).

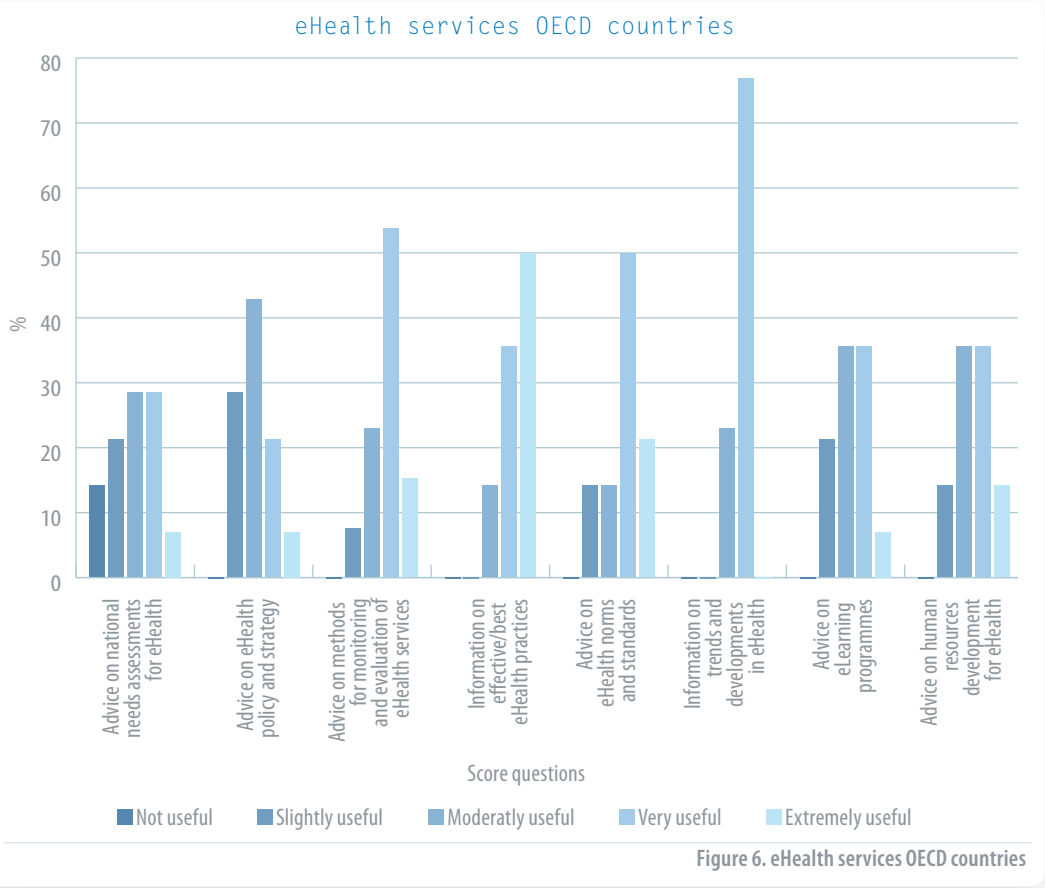



**Figure 6. eHealth services OECD countries**

With regard to eHealth services, there is a degree of consistency between the OECD and non-OECD country groups: both would consider it *very useful* if WHO would provide:

- advice on methods for monitoring and evaluating eHealth services;
- information on effective/best eHealth practices;
- information on trends and developments in eHealth; and
- advice on eLearning programmes.

Results are presented along the following format:

- definition or description of the eHealth service;
- an analysis of the response; and
- a table of aggregated data indicating the mean, median and mode values.

## Advice on national needs assessments for eHealth

***Services to assess the needs and benefits of eHealth. These would be provided at a national level and on a country-by-country basis.***

Table 15 shows that the non-OECD countries would find advice of this kind *very useful*. The OECD countries, however, found it only *moderately useful*. The differences are likely to be explained by the more advanced development of eHealth in the OECD countries.

| | RESPONSES | MEAN | MEDIAN | MODE |
|---|---|---|---|---|
| Non-OECD | 76 | 4.92 | 4 | 4 |
| OECD | 14 | 2.93 | 3 | 3 |

**Table 15. Advice on national needs assessments for eHealth**

## Advice on eHealth policy and strategy

***The effective development of eHealth and its integration into mainstream health care is best achieved through the creation of an eHealth strategy with the support of appropriate policies. Advice can improve the quality of both if provided in a timely manner.***

Table 16 illustrates that non-OECD countries would find this *very useful* while the OECD countries found it *moderately useful*; many of the latter already have policies and strategies in place and this would explain their response.

This policy theme will be covered in greater detail in the Global Observatory for eHealth Annual Report.

| | RESPONSES | MEAN | MEDIAN | MODE |
|---|---|---|---|---|
| Non-OECD | 76 | 3.96 | 4 | 4 |
| OECD | 14 | 3.07 | 3 | 3 |

**Table 16. Advice on eHealth policy and strategy**



## Advice on methods for monitoring and evaluation of eHealth services

***It is the responsibility of governments to ensure that money allocated to health care is spent effectively. The creation of monitoring and evaluation tools are expensive and time consuming so any advice provided which shortens the development process or improves its efficacy would be useful. In the case of eHealth it is important to ensure that it is delivering the expected/ promised benefits.***

Most countries would find WHO guidance on methods for monitoring and evaluation of eHealth services *very useful* (Table 17).

| | RESPONSES | MEAN | MEDIAN | MODE |
|---|---|---|---|---|
| Non-OECD | 74 | 3.96 | 4 | 4 |
| OECD | 13 | 3.77 | 4 | 4 |

**Table 17. Advice on methods for monitoring and evaluation of eHealth services**

## Information on effective/best eHealth practices

***There is an increasing acceptance that evidence-based medicine can contribute significantly to the effectiveness of medical practice. This principle also applies to eHealth.***

Table 18 shows that most countries would find this information *very* to *extremely useful.*

| | RESPONSES | MEAN | MEDIAN | MODE |
|---|---|---|---|---|
| Non-OECD | 78 | 4.12 | 4 | 4 |
| OECD | 14 | 4.36 | 4.5 | 5 |

**Table 18. Information on effective/best eHealth practices**

## Advice on eHealth norms and standards

***eHealth is a combination of ICT and healthcare technologies and practices. Standards are critical to ensure lowest cost implementations and interoperability between systems.***

Most countries would find this service *very useful* (Table 19). There was some variation among the OECD countries as to the usefulness of such advice. For example, some countries already have organizations applying technical standards in this domain.

| | RESPONSES | MEAN | MEDIAN | MODE |
|---|---|---|---|---|
| Non-OECD | 75 | 4.25 | 4 | 4 |
| OECD | 14 | 3.79 | 4 | 4 |

**Table 19. Advice on eHealth norms and standards**

## Information on trends and developments in eHealth

***Providing such information allows for the benchmarking of progress. Others can learn from these experiences and apply them to their own situation.***

Most countries would find this service *very useful* (Table 20).

| | RESPONSES | MEAN | MEDIAN | MODE |
|---|---|---|---|---|
| Non-OECD | 78 | 4.01 | 4 | 4 |
| OECD | 13 | 3.77 | 4 | 4 |

**Table 20. Information on trends and developments in eHealth**

## Advice on eLearning programmes

***eLearning uses ICT to develop and deliver courses in most disciplines, and can be an effective tool in teaching health sciences. Advice on the availability of existing courses as well as training on how to develop new courses can help countries benefit from this mode of learning.***

The non-OECD countries would find this service *very useful*, while OECD countries found it *moderately useful* (Table 21).

| | RESPONSES | MEAN | MEDIAN | MODE |
|---|---|---|---|---|
| Non-OECD | 77 | 4.12 | 4 | 4 |
| OECD | 14 | 3.29 | 3 | 3 |

**Table 21. Advice on eLearning programmes**

## Advice on human resources development for eHealth

***This includes the provision of advice on all aspects of human resource development from training in the use of eHealth techniques to the organizational structures required to best ensure the safe and effective use of eHealth.***

Both OECD and non-OECD countries would find this service *moderately* to *very useful* (Table 22).

| | RESPONSES | MEAN | MEDIAN | MODE |
|---|---|---|---|---|
| Non-OECD | 77 | 4.26 | 4 | 4 |
| OECD | 14 | 3.50 | 3.5 | 3 |

**Table 22. Advice on human resources development for eHealth**

## Other requests

This question allowed countries to express any further needs not already included in the survey. Some of the requirements have been covered in other sections of this report, but their inclusion here reiterates their importance to the countries requesting these services.

### Legal, policy and standards

- legislation for eHealth implementation and use;
- eHealth security issues; and
- guidelines on what organizational structures are needed to integrate eHealth into the existing health care system and how to achieve this.

### Self-help and benchmarking

- information on effective practice and an analysis of those eHealth initiatives that failed;
- a network to exchange information on eHealth;
- study tours to learn from other country experiences; and
- guidelines on ICT equipment required to benefit from eHealth.

### Use of eHealth services by health care professionals

- training of eHealth professionals and providing advice on the development of eHealth services; and
- equipping eHealth training centres.

### Direct action by WHO

- advocating the inclusion of ICT in government-sponsored health-related curricula;
- organizing international conferences on eHealth;
- encouraging the development of transnational collaborative programmes using eHealth technologies; and
- creating and providing access to a network of suitably qualified eHealth consultants.

### Finance and funding

- allocation of funds and other resources to support the introduction of eHealth and eHealth support.

### Technical

- encourage the use of open source software in the development of eHealth systems.


Database manager in the Democratic Republic of Congo receiving epidemiological data from the field via HF radio and recording results on a central database.

# Recommendations

## Key findings

Several issues emerged after analysis of the country responses to the survey.

First, it is clear that most Member States would welcome the active involvement of WHO in the development of generic eHealth tools and the provision of guidance in creating and implementing eHealth strategies and services.

Second, there is an overall lack of awareness as to what eHealth tools and services already exist world-wide.

Third, the data were somewhat confounded because OECD countries did not express consistent views of their needs in eHealth areas. This can be explained by the more advanced and varying degrees of eHealth implementation in these countries. Non-OECD countries did, however, consistently express their need for guidance in a broad range of eHealth areas.

# Conclusion

Based on the results of this survey, the Global Observatory for eHealth now has valuable data with which to tailor future initiatives.

## *Healthcare*

There was significant demand for the provision of generic tools to support the clinical and administrative functions of health care services. This included systems of varying degrees of complexity in both primary and secondary care such as electronic health records, patient administration, hospital information systems and general practitioner information systems.

## *Policy and strategy*

Countries indicated a strong desire for:

- guidance with policy and strategy development for eHealth;
- advice on needs assessment and evaluation of eHealth services;
- information on best practice and trends;
- advice on eHealth norms and standards; and
- consultancy services to assist in all aspects of eHealth.

## *Education*

All respondents expressed a need for education and training in eHealth. There is also a significant demand for the use of eLearning methods in health sciences.
Some additional requests included:

- access to digital libraries and information about evidence-based research within the eHealth domain; and
- establishment of a network to share experiences internationally.

## *Information*

Directories of health care professionals and institutions can assist governments in realizing, quickly and effectively, the required administrative and legal basis for many aspects of eHealth delivery.

Pharmaceutical or drug registries are fundamental if control of the efficacy and cost of medicines is to be exercised at regional or national levels. This is especially true in situations where health care consumes an increasing proportion of national budgets. Generic ICT-based tools are seen as a fundamental way of creating these both cost-effectively and rapidly.

Providing generic tools to enable registration of groups of patients suffering from similar conditions creates a valuable basis for maintaining the health of these groups and identifying priorities for health care expenditure.

The importance and value of these information systems was clearly recognized by countries responding to the survey. Not surprisingly, the highest demand came from countries which are still waiting to implement these solutions.

# Proposed action

The resolution passed at the Fifty-eighth World Health Assembly raised expectations that WHO will become actively involved in the provision of generic eHealth tools and services. The survey responses received have clearly demonstrated that this move is welcomed by many WHO Member States. In this vein the report by the WHO Secretariat on eHealth tools and services prepared for the 117th Session of the Executive Board proposes specific initiatives that the Secretariat plans to develop to support eHealth in Member States.

The following recommendations complement the projects proposed to EB 117, focusing on the needs of Member States as expressed in the GOe survey.

**It is recommended that WHO in collaboration with appropriate partners should:**

1. **Facilitate the development of those generic eHealth tools most sought after by its Member States. These would include generic forms of tools for the monitoring and evaluation of eHealth services, drug registries, institutional patient centred information systems and directories of health care professionals and institutions.**
2. **Raise awareness of existing eHealth tools and services through the creation of electronic directories and that there should be a special focus on open source eHealth solutions.**
3. **Develop an international knowledge exchange network to share practical experiences on the application and impact of eHealth initiatives. This would be Internet based and could be supplemented by international eHealth conferences to facilitate networking.**
4. **Create an eHealth information resource to support the needs of Member States in key areas such as eHealth policy, strategy, security and legal issues.**
5. **Promote the use of eLearning programmes for professional and ongoing education in the health sciences. Collaborations should be developed to generate databases of existing eLearning courses. Further, WHO should advocate for the inclusion of eHealth courses within university curricula.**

# Annex

## List of Member States by WHO regional distribution

(indicating survey respondents and OECD members)

### WHO African Region

**Algeria**
**Angola**
**Benin**
Botswana
**Burkina Faso**
**Burundi**
**Cameroon**
Cape Verde
**Central African Republic**
**Chad**
**Comoros**
**Congo**
Côte d'Ivoire
**Democratic Republic of the Congo**
Equatorial Guinea
**Eritrea**
**Ethiopia**
**Gabon**
**Gambia**
**Ghana**
**Guinea**
**Guinea-Bissau**
**Kenya**
**Lesotho**
Liberia
**Madagascar**
**Malawi**
**Mali**
**Mauritania**
Mauritius
**Mozambique**
Namibia
**Niger**
Nigeria
Rwanda
Sao Tome and Principe
Senegal
**Seychelles**
**Sierra Leone**
South Africa
**Swaziland**
**Togo**
**Uganda**
**United Republic of Tanzania**
**Zambia**
Zimbabwe

### WHO Region of the Americas

Antigua and Barbuda
Argentina
Bahamas
Barbados
**Belize**
Bolivia
Brazil
Canada**
**Chile**
Colombia
Costa Rica
Cuba
Dominica
**Dominican Republic**
Ecuador
**El Salvador**
Grenada
Guatemala
Guyana
Haiti
**Honduras**
Jamaica
**Mexico****
Nicaragua
Panama
**Paraguay**
**Peru**
Puerto Rico*
Saint Kitts and Nevis
Saint Lucia
Saint Vincent and the Grenadines
**Suriname**
Trinidad and Tobago
United States of America**
Uruguay
Venezuela (Bolivarian Republic of)

### WHO South-East Asia Region

**Bangladesh**
**Bhutan**
**Democratic People's Republic of Korea**
**India**
Indonesia
**Maldives**
**Myanmar**
**Nepal**
**Sri Lanka**
**Thailand**
Timor Leste

### WHO European Region

**Albania**
Andorra
**Armenia**
**Austria****
Azerbaijan
**Belarus**
**Belgium****
Bosnia and Herzegovina
Bulgaria
**Croatia**
**Cyprus**
**Czech Republic****
Denmark**
Estonia
**Finland****
France**
Georgia
Germany**
Greece**
**Hungary****
**Iceland****
Ireland**
**Israel**
Italy**
Kazakhstan
Kyrgyzstan
**Latvia**
**Lithuania**
Luxembourg**
Malta
Monaco
Netherlands**
**Norway****
**Poland****
Portugal**
Republic of Moldova
Romania
**Russian Federation**
San Marino
Serbia and Montenegro
**Slovakia****
Slovenia
Spain**
Sweden**
**Switzerland****
Tajikistan
The former Yugoslav Republic of Macedonia
**Turkey****
Turkmenistan
Ukraine
**United Kingdom of Great Britain and Northern Ireland****
Uzbekistan

### WHO Eastern Mediterranean Region

Afghanistan
Bahrain
**Djibouti**
**Egypt**
**Iran (Islamic Republic of)**
Iraq
**Jordan**
Kuwait
**Lebanon**
Libyan Arab Jamahiriya
**Morocco**
**Oman**
Pakistan
Qatar
Saudi Arabia
**Somalia**
**Sudan**
Syrian Arab Republic
Tunisia
**United Arab Emirates**
Yemen

### WHO Western Pacific Region

**Australia****
**Brunei Darussalam**
Cambodia
**China**
**– China, Hong Kong Special Administrative Region**
**– China, Macao Special Administrative Region**
Cook Islands
**Fiji**
Japan**
Kiribati
Lao People's Democratic Republic
**Malaysia**
Marshall Islands
Micronesia (Federated States of)
**Mongolia**
Nauru
New Zealand**
Niue
Palau
Papua New Guinea
**Philippines**
**Republic of Korea****
Samoa
**Singapore**
Solomon Islands
Tokelau*
**Tonga**
Tuvalu
Vanuatu
**Viet Nam**

**Bold** indicates survey respondents. * WHO associate members. ** OECD member countries.

# eHEALTH TOOLS & SERVICES

## Needs of the Member States

Report of the WHO Global Observatory for eHealth