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Statistical Indicators Benchmarking the Information Society

SIBIS – Workpackage 2: Topic research and indicator development

Topic Report No.9: Health

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0 Overview

This revised version of the deliverable has been prepared following the outcome of the first project review. The report has been restructured in accordance with the revised template for Topic Reports.

In relation to the comments of the reviewers, it needs to be restated that the primary focus of the work on the first versions of the Topic Reports has been to review current indicators and identify (existing and/or new) indicators to be included in the "omnibus" surveys carried out in SIBIS. Given the constraints imposed by the surveys on the types of indicator to be applied and tested, and the restricted number of such indicators that could be included on the eHealth topic, it is felt that the 6 indicators outlined in generic terms in Figure 4-1. Sibis ehealth indicators summarised and subsequently operationalised to the level of survey questions - health information search activity by internet users, success of information search activity, judgement of value of information found, need to search sites in language(s) other than mother tongue, reasons for eHealth activity, and perceived trustworthiness of sites according to type of host organisation - were most appropriate for initial benchmarking and testing through the surveys.

The next stage of the work on the eHealth topic will be carried out in WP 5. Part of the work will involve reviewing the indicators in the light of the results of the survey. The work will also address the issue of hierarchically organising the indicators, and will give more attention to result-oriented and impact-focussed indicators and to composite indicators, in line with the comments of the reviewers. The positioning of the revised and expanded set of indicators in relation to EU and national statistical/survey activities and target audiences will also assessed and taken into account in this stage of the work with a view to demonstrating the relevance of the final set of indicators proposed. This aspect of the work will also be used to help "market" the indicators to statistical/survey organisations by showing the relevance of the indicators to their current and future activities.

This current report on the eHealth topic provides an overview of developments at policy level in relation to *e*Health and statistics on health. It then goes on to review some currently used statistical indicators in the area and makes proposals for the development of new ones. The report begins by presenting a brief overview of the concept of health and how it relates to the types of statistical information which is collected and the uses to which it is put. This is done in order to help delineate the field of *e*Health, as the field of statistical information on health is extremely broad and varied, and to provide a glimpse of what the future might hold with regard to the development of *e*Health in the future.

This section is followed by a discussion of current activities in the field of *e*Health, with the intention of drawing up a structure which may be used to help organise the statistical indicators being proposed to track developments in *e*Health.

The report moves on to present a discussion of current policy developments in relation to *e*Health, especially with regard to the European context. These are of particular relevance to the development of statistical indicators, since they point to the objectives and future directions of the developing *e*Health field and provide pointers to the kinds of statistical indicators which may be needed. Also treated here are some current developments in relation to improving the quality of health statistics on general, as these developments may have some implications for development of indicators of *e*Health development.

The report concludes with a review of statistical indicators of *e*Health which were available to the project and points to some gaps in the field which may need to be covered. It then proposes a set of new indicators which may be of benefit to tracking developments in *e*Health into the future.

1 Introduction to the deliverable

This chapter provides an introduction to the deliverable and its objectives. It also describes the approach taken to the work and the perspective taken on the materials available for the work.

1.1 Objectives of the deliverable

The key objectives of this deliverable are to:

- To describe the concepts of health and health statistics
- To define eHealth and related indicators
- To propose a framework for categorising and developing eHealth indicators
- To provide an overview of relevant policy developments in eHealth and to comment on how they are relevant for the development of statistical indicators
- To describe existing indicators of eHealth
- To propose a limited set of new indicators of eHealth

1.2 Approach taken to the work

The work involved in generating this deliverable involved the following stages:

- Undertaking a literature search for materials on eHealth indicators
- Undertaking a policy search for relevant policy documents
- Assessment of the materials collected
- Describing the statistical indicators and policies so identified
- Developing a framework for categorising eHealth statistical indicators
- Proposing new indicators of eHealth

1.3 Scoping the work

Health services account for between c.7% and 12% of GDP spending throughout the developed world. They are also amongst the largest employers in these countries.

Health services produce a wide range of statistics in relation to administration, clinical operations and research, many of which are stored on or transmitted via ICTs. In addition, health information and statistics have an increasing audience beyond the professionals and the practitioners. The Internet has made a substantial and increasing body of information available to patients and to the general public at large.

Moreover, there have been rapid and expanding developments within the area of telemedicine in the last decade or so. The use of ICTs to support image transfer, remote patient monitoring, teleconsultation and a range of other clinical applications has become a substantial feature of how clinical health services are delivered. Within the field of health service administration, there has also been substantial growth in applications, ranging from inter-administration applications (e.g. reimbursement, procurement) to public-administration applications, (e.g. making appointments).

The trends towards increasing penetration of ICTs in the health services can only continue. Not only will existing applications become more widespread, but new applications continue to emerge.

The range of materials available to the work in this deliverable is therefore potentially very large indeed. There are two main reasons for this situation. Firstly, the range of health statistics (as opposed to eHealth statistics) is immense. Secondly, the types of technology underlying eHealth and the range of specific applications is large and growing rapidly. Given the resources available to the project and its focus on developing indicators of eHealth, it was necessary to develop a strategy which enabled the limitation of the range of materials to be treated.

In relation to the first issue, even though more and more mainstream health statistics are gathered, transmitted, analysed and disseminated via ICTs, many of the uses of these statistics are so specialised as to preclude all but the professional classes from using them (for example, undertaking scientific studies in epidemiology). It was decided therefore to limit the analysis which follows in this deliverable to statistics which are 'mainstream' use, i.e. which are widely used by the professional and non-professional consumer. The focus here is on indicators of usage of applications, rather than on the statistics which might form the content of these applications.

A similar approach was taken to the second issue, i.e. the technology question. One of the main objectives of the SIBIS project is on usage of technologies rather than on the technologies themselves. It was therefore decided to focus on indicators of the usage of these technologies rather than on technology *per se*. However, a number of general level indicators of the types of technology in use have been included.

2 Framework for identifying eHealth indicators

2.1 The concept of health and health statistics

This chapter provides a brief overview of the concept of health and how it relates to health statistics. The range of health statistics and the uses to which they are put are of importance in helping defining the range of statistical indicators which might be used in relation to eHealth, both in terms of current usage and with regard to what might take place in the future. The Chapter concludes with a proposal which delineates the field of eHealth from the more general one of health statistics.

2.1.1 The nature of health

Before examining indicator availability on health and *e*Health, it is useful to reflect on current notions of what constitutes health, as this helps explain the diversity of indicators used in the area.

In 1943 the World Health Organisation proposed a definition of health which states that:

'Health is a state of complete physical mental and social wellbeing'

In practice this means that health is not only an absence of disease, but it is a positive phenomenon, a state of wellbeing.

The determinants of health status are recognised to be multifactorial. The main classes of determinant are:

- Genetic complement - this includes both genetic diseases and genetic propensity to disease
- The physical environment - this includes elements of the environment such as heat, cold, dust as well as accidents
- The chemical environment - this refers to all chemical agents in the environment which are potentially harmful to health
- The biological environment - this refers to all biological agents in the environment which are potentially harmful to health
- The psychosocial environment - this refers to elements of the social and psychological environments which can be harmful to health
- Health related behaviours - this refers to aspects of our behaviour (e.g. diet, exercise, substance abuse) which are harmful to our health

Despite the positive and broad definition of health offered by the WHO, one which is generally accepted by all stakeholders, these factors are often organised into epidemiological theories which seek to explain the occurrence of specific diseases. Risk factors for these diseases are identified and their relationship to the disease is assessed, often using sophisticated multivariate analysis techniques. This epidemiological approach to understanding disease gives rise to the generation of a wide range of health statistics. For example, in relation to coronary heart disease alone, more than 100 factors have been identified as being related to the aetiology of the disease.

There are also theories concerning how health is created and maintained (i.e. salutogenic theories) which have particular relevance to the concept of wellbeing. Broadly speaking, these theories propose that our health is created by our actions within the environments in which we live (allowing for our genetic complement). It is promoted by the quality of the work we have, the housing we live in, the physical, chemical and biological environments we inhabit, the behaviours we engage in and the social environments in which we interact. These kinds of

theories also give rise to the collection of information on a very wide range of variables which are linked to health status.

The concept of health can therefore be seen to be a complex one, in which variables from many different fields interact to influence health in either positive or negative ways.

2.1.2 Health theories and health data

The implications of these broad approaches to understanding health for the kinds of statistics which are collected are significant. Both approaches imply that there are a multiplicity of variables upon which data is collected, and by no means all of them come from within the sphere of what might commonly be regarded as the health sphere. For example, data such as the following is commonly collected in relation to both scientific studies and health policy and management processes:

- Socio-economic status
- Demography
- Education
- Age
- Gender
- Income
- Occupation
- Ethnicity
- Housing
- Household structure
- Geographical location
- Social networks
- Etc.

This information is collected both for its value as an independent variable in explaining differences in health status (and indeed these variables are implicated in the process of building health also) and because it can also provide information which is useful for the planning of health services.

Of course there is a large class of health variables upon which data is also collected. These may attempt to directly measure health status, for example various clinical measures, or they may be indirect, for example diagnosis data and health service usage data.

The range of information collected about health status *per se* is huge. If we take coronary heart disease as an example, information may be collected on a very large number of indicators relating to, e.g., physiological measures of heart functioning, lung functioning, blood chemistry, dietary information, family history, health related behaviours, work and life stress, and many more.

These kinds of data are not just collected for purposes of scientific research, but they are more routinely collected in relation to the operation of health services and the clinical process. They are an essential part of the normal operation health services, and in light of recent technological developments in *e*Health, they are increasingly being used in the context of many forms of telemedicine and telehealth.

However, the sheer volume of information and the range of information which is used in health services makes it impractical to consider producing indicators of all of them within the present context of developing indicators for *e*Health. Even limiting these variables to those used in a

telemedicine context leaves far too broad a range of variables to be considered (see for example, Darkins and Cary 2000).

2.1.3 Making a selection

There is clearly a need to implement a perspective which reduces the number of indicators proposed as being relevant for *e*Health. It is therefore proposed to limit the selection of relevant *e*Health indicators using three mechanisms:

- Using the policy statements of *e*Europe with respect to *e*Health to delineate the field of enquiry
- Using the range of current health applications supported on *e*Health systems to help delineate the range of variables to be focused upon
- Focusing on usage of eHealth systems rather than content.

This latter strategy is especially important, as it enables the integration of user and usage type issues to be included in the selection of variables of interest in the current context. In addition, it is congruent with the aims enunciated for *e*Health in the *e*Europe Action Plan.

2.2 The structure of eHealth activities

This Chapter examines the types of health related activity which are currently supported by ICTs. It proposes a framework for organising them which takes into account the types of technology used, the type of health activity undertaken and the stakeholders who are involved. This framework is then used in the final Chapter to organise the currently available set of indicators for eHealth.

2.2.1 Definitions

There are various definitions available in relation to the related key concepts of eHealth, telehealth and telemedicine. In what is a rapidly developing field, the original ICT based health applications which gave rise to definitions of these concepts constantly evolve and new applications emerge. This phenomenon presents difficulties when seeking to define these concepts, as they may become redundants within short periods of time.

However, there is a reasonable consensus around the following definitions, which appear to be adequate for purposes of the current project:

- The words telehealth and eHealth appear to be used as synonyms - no major distinctions are made between them. These phrases may be used interchangeably.
- EHealth is a larger concept than telemedicine - it subsumes the activities of telemedicine and is related to all ICT based health related interactions.
- Telemedicine relates to the more narrow area of health related consultation which is mediated by ICT. This may involve practitioner to practitioner consultation or practitioner to patient consultation.

Wooton (1995) offers a widely used definition of telemedicine:

> *Telemedicine is health carried out a distance.*

In more detail, telemedicine enables teleconsultation between a patient and a practitioner, usually a doctor, by using technologies such as store and forward, picture phone, television, video, satellite, internet, facsimile, telephone, radio or audio.

Darkins and Cary (2000), while emphasising that there is no value in being over specific in defining terms for the reasons mentioned above, state that telehealth enables communication between a patient and a practitioner, a source of health care advice or an expert system by using any communication modality that allows the physical separation of patient and practitioner/advice.

The World Health Organisation (Antezena, 1997) also offer a definition of these terms which fits in with their own major policy concerns:

> *If telehealth is understood to mean the integration of telecommunications systems into the practice of protecting and promoting health, while telemedicine is the incorporation of these systems into curative medicine, then it must be acknowledged that telehealth more closely corresponds to the international activities of WHO in the field of public health. It covers education for health, public and community health, health systems development and epidemiology, whereas telemedicine is orientated more towards the clinical aspect. (Antezena, 1997).*

These definitions broadly concur and offer a useful starting point for developing a framework for describing all of the health applications which are subsumed under these terms.

2.2.2 Types of eHealth applications

The major distinction between eHealth and telemedicine concerns the nature of the interaction between patient and practitioner. In telemedicine applications, the practitioner plays a central role in either advising, diagnosing or monitoring patients, or if patients are not involved in the interaction, the practitioner interacts with fellow practitioners. In eHealth applications on the other hand, practitioners may not be directly involved in the interaction, and the user of the application may not be a patient.

Many authors provide a good classification of the kinds of applications available under the telemedicine and eHealth labels. The following is a listing of telemedicine applications integrated from a variety of these sources (e.g. Darkins and Cary, 2000; Empirica and WRC, 2000).

- Patient-practitioner consultation
- Practitioner-practitioner consultation
- Clinical investigations in health care
- Remote monitoring of patients
- Remote diagnosis in health care
- Remote treatment in health care
- Facilities management of remote health care services
- Providing information to patients
- Continuing education to practitioners
- Transfer of information throughout health care services
- On-line health information
- The exchange of patient data

Within the telemedicine area in the US, a specification of the types of health application which can be supported by currently available technologies include (US Federal Communications Commission Advisory Committee on Telecommunications, 1997):

- Provider to provider consultation
- Provider to patient consultation
- Physicians and other professionals and providers participating in ongoing education
- Access to medical databases by physicians etc.
- Emergency departments getting access to support by specialists
- Comprehensive specialty services in radiology, dermatology, selected cardiology, pathology, obstetrics (fetal monitoring), paediatrics, mental health/psychiatry,
- Emergency departments to interact with paramedics on the scene

These categories of application may be further subdivided, for example, into the areas of clinical specialty to which they apply (e.g. radiology, psychiatry, obstetrics, etc.). For example, the types of health interaction supported in psychiatry include initial evaluation, emergency care, pre-admission and pre-discharge planning, medication management, follow-up care, evaluations and diagnostics and many more (Folsom, 1995).

New applications which support these types of health interaction are being developed constantly. Darkins and Cary (2000), for example, point to developments in the fields of telespirometry, teleoncology, neurology, otorhinolaryngology, teleophthalmology, telemammography, telehome care, prison health care and cardiology which look as if they may be able to make a business case for their introduction.

These classifications point to the increasing and wide range of clinical and patient management applications which are now available which make the experience of the clinical interaction more efficient for both the practitioner and patient. However, for the non-patient, or for the person who is not engaged in a clinical interaction with a practitioner, the range of applications currently available is somewhat less broad. Basically, there are three types of application in common usage for these non-clinical interactions:

- Health information services
- Support groups
- Access to health administrations

In the first type of application, users access health information websites which provide a wide range of information in relation to health issues. These sites may be specialist, i.e. they focus on specific disease groups, or they may be broader, providing information on multiple health issues. A sub type of this kind of application concerns the purchase of medical and especially pharmaceutical products and services over the Internet.

The second type of application provides remote interactive support to patients and concerned others who have an interest in specific illnesses. This type of website may be supported by a practitioner or it may be supported only by fellow sufferers of the illness.

The third type of application refers to a type of system which is being specifically encouraged by the eHealth initiative in Europe, i.e. systems which allow the patient or user to access health administrations for purposes of, for example, making appointments with health service professionals, communicating with practitioners, or undertaking administrative tasks.

These classifications of eHealth application services will be carried forward into the framework for describing eHealth usage which is outlined below in Section 4.5.

2.2.3 Types of user

There are three main types of user of eHealth systems. These are:

- Professionals - these include doctors, nurses, paramedics, technicians and educators
- Patients - these are members of the general public who use eHealth systems in the context of a professional health relationship with a professional
- Public - these are members of the general public who use eHealth systems, but not in the context of a professional relationship

In general terms, only the first two categories of user use telemedicine systems, while all three can use the more generally available telehealth systems.

This categorisation may be further differentiated (see for example, Empirica and WRC, 2000) into five types of user:

- Direct health care providers
- Consumers
- Educational and support services
- Purchasers and reimbursers
- Policy/administration

In this typology, recognition is given to the different types of professional usage, i.e. to providers, administrators, educationalists and administrators and policy makers.

For current purposes is proposed to integrate these two lists of users, since it enables a better differentiation of potential indicators to be generated. The full list of users therefore is:

- Direct health care providers
- General public
- Patients
- Educational and support services
- Purchasers and reimbursers
- Policy/administration

These distinctions between users are important as they carry implications for the kinds of questions and indicators which might be applied to their usage. For example, questions concerning privacy and confidentiality are more appropriate for patients involved in some kind of teleconsultation relationship with a professional than they are for members of the general public interacting with a health information source.

2.2.4 Important issues in eHealth usage

There are a number of important regulatory, legal and political issues which affect the development of eHealth applications and which are relevant to the development of indicators of eHealth usage. These include:

- Privacy
- Confidentiality
- Reliability
- Effectiveness

There are serious concerns among regulators on both sides of the Atlantic and users regarding the issues of privacy and confidentiality with regard to health related information being carried on eHealth systems. These concerns relate not only to the obviously sensitive issues surrounding the use of the electronic patient record in the many telemedicine

applications, but also to user information which may be acquired in telehealth systems which do not have a clinical dimension. Regulators are concerned with devising methods which ensure that any patient related data can be treated in privacy, i.e. ensuring that this information is limited to the patient-practitioner interaction. Similarly, they are concerned with confidentiality issues, i.e. with ensuring that data is not used for purposes other than which it was collected for and is limited to those who need to know.

There are however, tensions here which are perhaps unique to the field of health. These tensions occur between health information being viewed as a private commodity which is limited to traditional patient-practitioner encounters and the view that such data can be used for the public good, i.e. where important clinical and other data from patient records are used to compile public health and other statistics such as indicators of health care system usage.

These concerns and tensions have been heightened because of the dramatic difference in possibilities provided by the use of ICTs in this regard. Formerly, the collection of public health statistics was an activity largely divorced from the clinical interaction between patient and practitioner. Very often, such public health data collection and compilation activities were undertaken as completely separate investigations. Now however, with the increasing introduction of electronically held patient health data systems, the possibilities to produce more and better quality public health data are increasingly obvious.

Major regulatory initiatives are now underway to deal with these issues in both the US and Europe. The US is currently undertaking a major design activity in relation to its national health statistics while the British have been engaged in an ongoing initiative to update health statistics which are held electronically since the 1980's (e.g. NVCH (2000); Kaanan (2000); DHHS (2001); DHSS, (1997); Eng. and Gustafson (1999)). No final conclusions have been reached with regard to how these tensions are to be dealt with, but related sets of principles have been proposed and which are applied to the ongoing design and development work.

A major emerging concern relating largely to health information websites is that of reliability. Given that there is no effective control in place regarding the quality of the information provided, nor of the *bona fides* of the information provider, there is the potential for the user of such sites at least to be misled, and possibly worse. With modern trends towards patients and others becoming better informed about their own health and illness status, and the increasing trends towards self treatment, there are major issues concerning the reliability of the information available on such websites. A number of initiatives have been undertaken in Europe and the US to address this issue (e.g. eEurope (2002 a,b); Health summit working group (2001); SciPICH (2001)). These initiatives provide guidelines for site developers and a framework to assist users in the evaluation of health related websites. In the current context, they provide useful source material for the development of indicators of the reliability of such web sites.

These sources will be drawn upon further in Chapter 4 in proposing indicators of eHealth.

The issue of the effectiveness of eHealth systems has also been raised as an issue of concern, especially in the United States, where a more market oriented model of eHealth systems tends to be applied. There are two dimensions to this issue – the extent to which eHealth or telemedicine systems contribute to improving the quality of health care and the extent to which they contribute to reducing the costs of health care. Health care quality may be improved by telemedicine systems in a number of obvious ways, for example, by enabling access to scarce expertise in remote geographical regions, by enabling the transfer of patient data in a more efficient manner, or by improving the monitoring of patients under treatment. eHealth information systems may also improve health care quality by, for example, providing patients and consumers with more and standardised information or by providing access to support via self help groups mediated by the Web.

The issue of the cost effectiveness of eHealth systems is more complex, especially in Europe where a greater proportion of health care costs are covered by the public sector. In the US, there is a greater emphasis on ensuring a financial return on investment in such systems, especially in the private sector.

The issue of system effectiveness, especially in relation to the efficacy of treatment, will become more important in the future, as more and more eHealth systems are integrated into the clinical process. There is a need to develop indicators of such effectiveness, as there would appear to be, as yet, few indicators readily available of this important dimension of eHealth systems supporting the clinical process.

2.2.5 A framework to describe eHealth usage

A crucial issue in developing indicators of eHealth relates to the question of who is the user and to what kind of interaction the usetris engaging in with the eHealth system. As indicated above, there are three major classes of user – practitioners, patients and the public, each of which tend to have different kinds of interaction with eHealth systems and to use different kinds of eHealth systems. These distinctions between users are used as the major organising element of the framework described below, since the kinds of indicators of usage which may be developed are heavily dependent on the type of usage to which the eHealth systems are put. In addition, there are three other types of user - educational and support services, purchasers and reimbursers and policy/administration.

The framework described below attempts to describe the various kinds of interaction with eHealth applications by the various kinds of user. This is done in order to map the entire field of possible interactions with such systems, so that possible indicators of eHealth usage can be generated.

Of course, some more or less well tried indicators have already been used, and in Chapter 4 and Annex 1 (which describes the proposed and existing indicators for eHealth respectively) these are mapped on to the structure outlined below. However, the framework may also be used to help identify gaps in the existing indicators, i.e. to indicate areas where potentially important indicators may need to be developed. The framework helps in this task by pointing to obvious omissions and it is a short step to designing specific types of question which address, for example, usage, satisfaction, efficacy or usability.

There are five elements to the framework. These are:

- Users
- Usage
- Systems
- Issues
- Questions

Each of these elements are presented in detail in the Table below.

2.2.6 Using the framework

The framework attempt to provide an overview of the 5 main elements of eHealth system usage which might be used to develop statistical indicators. To do so each of the five elements of the framework should be treated as independent dimensions. This gives a 6 X 5 X 12 X 4 X 9 array of potential indicators, though of course, each single cell of the matrix does not produce meaningful questions.

The breakdown of each of the five elements into sub dimensions should be taken as an heuristic exercise, based though it is on the available literature, it should not be seen as a definitive version of these dimensions. It is instead intended as a framework which can be expanded as new information becomes available and as technological advances in the eHealth area evolve.

2.3 Policy developments in eHealth

This Chapter outlines some recent relevant policy developments in relation to eHealth at European level. In particular it looks at the eHealth initiative itself and also at the new Public Health Programme of DG-Sanco. These policies are of particular relevance to developing statistical indicators since they on the one hand define the policy objectives which the EU has agreed for eHealth and on the other, they point to the types of health statistics which Europe wishes to collect in the coming years.

2.3.1 Introduction

There are a number of international policy developments taking place at present which have implications for the development of eHealth, defined in its broadest sense. These include:

- Development of quality criteria for eHealth related websites (Europe and the US)
- The EU Public Health Programme
- The eEurope programme
- National programmes on health record data

The major concerns of these initiatives have their counterparts at national level in many countries, and this is particularly the case in relation to the Public Health programme and the eEurope initiative. However, for current purposes this chapter will confine itself to international developments, as these tend to provide direction to national programmes, and in some cases are derived from national programmes.

Table. Framework for describing eHealth system usage.

1. Users	2. Usage	3. Systems	4. Issues	5. Questions
· Practitioners · Patients · General Public · Educational and support services · Purchasers and reimbursers · Policy/ administration	· Clinical investigation · Education · Information acquisition · Information transmission · Support provision	· Patient-practitioner consultation · Practitioner-practitioner consultation · Clinical investigations in health care · Remote monitoring of patients · Remote diagnosis in health care · Remote treatment in health care · Facilities management of remote health care services · Providing information to patients · Continuing education to practitioners · Transfer of information throughout health care services · On-line health information · The exchange of patient data	· Quality · Privacy · Confidentiality · Reliability · Effectiveness	· Efficacy · Practicality · Value added · Clinical utility · Confidentiality · Privacy · Usability · Cost · Reliability · Satisfaction

2.3.2 Development of quality criteria

The issue of the quality of health related websites is a topic of much current debate on both sides of the Atlantic. This debate has arisen from specific concerns about such issues as the reliability and transparency of, and potential biases in the information contained within health information web sites. These, in turn, give rise to concerns about the safety of the population who use these health information sites.

As a result, policy makers have undertaken the initiative by establishing projects which seek to develop quality criteria for health information web sites. However, these initiatives have only a voluntary status – there is no obligation on website developers to follow the guidelines which have been produced. As a results, the guidelines have been largely aimed at users of sites – they seek to educate the user sufficiently to enable them to make an evaluation of the overall quality of the site. In essence, the principle of *caveat emptor* still applies.

In Europe, the Commission has sponsored an initiative in this area. It began by appointing an expert group to investigate the issues surrounding health information website quality and to produce a set of guidelines. These draft guidelines were then subject to a period of consultation, and, following amendments a definitive set of guidelines have been agreed. The guidelines address the following issues:

- Accessibility
- Accountability
- Commercial purposes
- Credentials
- Funding
- Opting-in
- Personal data
- Privacy, security and confidentiality policies and tools
- Provider

In the United States similar concerns have been expressed. For example, SciPICH (a specialist committee appointed by the US Government, have produced a set of reporting templates and tools for the evaluation of web sites. the areas of quality which these templates address are:

- Description of application
- Formative and process evaluation
- Outcome evaluation
- Background evaluators

In addition, the SciPICH group has produced an evaluation tool aimed at users of health information web sites. The contents of this tool are:

- Background of developers/sponsors
- Purpose of the application
- Content of the application
- Confidentiality procedures
- Design of the website
- Evaluation results and effectiveness

In addition, the health summit working group has also developed an information quality tool. This consists of 21 questions addressing the following areas:

- Authority
- Complementarity
- Confidentiality
- Attribution
- Justifiability
- Transparency of authorship
- Transparency of sponsorship
- Honesty in advertising and editorial policy

These tools and guidelines represent concrete expressions of the concerns of both policy makers and consumers with regard to the important issues of safety, reliability and transparency with regard to health information websites. In the current context, the guidelines and tools provide a rich source of potential indicators on this important issue.

2.3.3 The EU Public Health Programme

The recently announced (2001) public health programme of DG Sanco is concerned with three main areas:

- Development of public health monitoring
- Development of rapid responses to public health threats
- Tackling the causes of disease

Strand 1 of the policy is particularly relevant. In this the Commission comment:

> *The Community action programme on health monitoring represents a first step at defining common health related indicators, collecting data by means of electronic communications developed in the Interchange of Data between Administration (IDA) scheme and capability for undertaking enquiries and analyses.*

According to the public health policy, two types of information should be collected:

1) Trends in health status

- Trends and patterns of demography, morbidity and mortality and health determinants
  - Analyses could cover different conditions, including physical and mental illness, specific population groups such as children and the elderly, trends in health related knowledge, attitudes and behaviour and gender specific issues
- Inequalities in health, covering variations between population groups of the determinants of health, morbidity and mortality, and assessment of interventions to reduce them.
  - Analyses would also cover issues of access to health services, their use and health outcomes.
- Other topics would be the interaction between health status and socio-economic factors such as social exclusion, migration and employment and between health status and environment.

2) Trends in health systems

- The impacts of trends in health status and health determinants on health services and interventions and health expenditure, such as changes in patterns of prescribing drugs, and the consequences of demographic trends, notably the ageing of the population.

- Developments in health systems, including reforms, distribution of resources and cost containment measures and their consequences, including their impact on health status.
- Trends in health systems costs and financing, including the role of state and private insurance
- The health sector as a productive factor in society, including its role as a major employer. Studies might be made e.g. on the impact of market mechanisms, measurements of needs for services, costs and expenditure calculation and control, competition between private and public provision and trends in managed care.
- Priorities in health, including priority setting mechanisms, as well as public attitudes and concerns about health and the effectiveness of health systems.

The significance of this policy in the present context is that the Commission will require the Member States to collect and make available the above mentioned information within the lifetime of the policy (2002-2006). This will also allow, in theory at least, for general public access to these statistics. To the extent that this occurs, it will represent a major advance on currently available health information systems.

Moreover, the emphasis on health systems information, e.g. reforms in health administration systems, will almost certainly include an direct element of relevance to eHealth, though the policy does not go so far as to specify any indicators of eHealth issues.

2.3.4 The eEurope programme

The eEurope action plan which was adopted by the Council of Ministers at Feira in June 2000 is described in detail elsewhere in publications from this project. It is proposed only to discuss the eHealth elements of the action plan here.

The overall objective of the eEurope action plan, as defined by the Lisbon European Council indicated that:

> *Real efforts must be made by Public Administrations at all levels to exploit new technologies to make information as accessible as possible.*

It is acknowledged that the challenge in relation to the realisation of this objective involves dealing with a large and complex sector with many information infrastructures, both administrative and professional. In this context the prime objective of the eHealth initiative is to:

> *develop an infrastructure of user friendly, validated and interoperable systems for health education, disease prevention and medical care.*

In addition to these broad objectives, the eHealth initiative recognises four major challenges:

- Best practice in electronic health services must be identified and disseminated. In parallel, European benchmarking criteria must be developed.
- The quality and authenticity of health information resources on the Internet must be addressed.
- There is a need to identify sources of independent medical technology assessment to assist purchasers decision making and the need for medical practitioners to have access to up to date, networked public health data guidelines to assist disease management decision making.
- There is also a need to address the legal and regulatory issues concerning responsibility and data protection.

To meet these challenges, the eEurope initiative has taken or will take a number of actions. These are proposed in the context that Member State Governments are responsible for the

management and operation of health services. The eEurope response should therefore be seen as a complement to actions taking place at national level.

The following specific initiatives have been set in motion:

- The IST programme will identify and disseminate best practices and develop benchmarking criteria
- The Commission will publish a Communication on legal aspects of eHealth in 2001.
- In depth EU wide technology assessments will take place. In addition, specific data assessment networks will be established.

Against this background, the Commission have proposed four actions to help implement the eEurope action plan. These are outlined in the Table below.

Table. eEurope action plan - Health online.

Action	Actor(s)	Deadline
Ensure that primary and secondary health care providers have health care telematics infrastructure in place including regional networks	Member States	end 2002
Best practices in electronic health services in Europe identified and disseminated, benchmarking criteria set	Member States, Commission, Private sector	as soon as possible in 2002
Establish a set of quality criteria for health related websites	Member States, Commission, Private sector	end 2001
Establish health technology and data assessment networks	Member States, Commission, Private sector	end 2002

A Commission staff paper produced for the Nice Council of Ministers meeting (European Commission, COM (2000)783) details the progress which has been made to that time in relation to eEurope actions. This paper outlines in tabular format the progress made in relation to eHealth actions.

In relation to the action to establish quality criteria and guidelines for health related web sites, the Commission had organised an expert workshop in January 2001 to draft these criteria. The results of this workshop have been taken into account in relation to indicator development. In addition, data collection was underway in relation to describing national and regional quality control systems and the CEC had been granted observer status on the US Health Website Advisory Committee.

Preparatory work was underway in relation to the second action, i.e. publishing a Communication on legal aspects of eHealth.

Much progress had been made in relation to the third action - ensuring that primary and secondary health care providers had access to health telematics infrastructures. A list of indicators had been agreed with the High Level Committee on Health (HLCH). The Member States had agreed to collect information on agreed indicators by February 2001 which was to be the basis of a monitoring report. In addition, Member states had agreed to input status data to the HLCH and the Health Council in 2002 and a final report is to be published by the end of 2002.

In relation to the best practice action, the Commission reported that a list of best practice indicators was to have been agreed by the HLCH, that calls would be made for best practice examples in the IST programme during 2001, that best practice projects in the RTD and IDA programmes would be identified and that dissemination would take place through the eEurope Website.

Finally, in relation to the action concerning the establishment of health technology and data assessment networks the Commission reported that four networking initiatives were in the process of establishment. These networks are concerned with Health information, exchange and monitoring system (HEIMS), Health surveillance system for communicable diseases (HSSCD), a health technology assessment network, and a Medical devices information network. In addition, work on a network concerned with the effectiveness of pharmaceutical products was under discussion.

These initiatives of the Commission and the Member States had not produced the range of indicators promised at time of writing, and these will be incorporated into the second version of this deliverable later in the project.

The eHealth element of the eEurope initiative addresses a remarkably wide range of actions in a sector which is notable for the wide range of statistics and indicators it already produces. While the eHealth action plan does not address all of the statistical indicators which are to be found in this sector, the objectives of the plan could be said to relate the wider area of health statistics. In particular, the prime objective of the programme, to develop an infrastructure of user friendly, validated and interoperable systems for health education, disease prevention and medical care, can be interpreted to ultimately cover much if not all of the statistics used in the health care sector.

This interpretation would pose a problem for the SIBIS project, as there are insufficient resources to even begin to address the wider area of health indicators. For this reason, the coverage of health statistics per se has not been included in the indicators which are presented in the next Chapter.

2.3.5 National programmes on health record data

There are a number of current initiatives to improve the quality of health statistics in Europe and the US. These are of interest not only because they point to the future for the acquisition and use of health statistics, but the also envisage that ICT will play a large role on their development and stage. In addition, the principles which underlie these initiatives are of importance to eHealth developments and the generation of statistical indicators.

There are a number of principles which have been enunciated which underlie the planning for the reorganisation of health statistics. These principles are similar across jurisdictions. For example, Kanaan (2000), in an interim report on shaping the vision for health statistics in the 21st Century in the US, identified 10 principles of approach. The most relevant in the current context are:

- Confidentiality must be protected
- Conceptual framework is needed
- Health statistics must be flexible enough to cope with new information needs
- Statistics must provide sufficient detail
- Data standards are essential
- Data should only be collected once
- Statistics must be fed back to communities
- System wide planning must be enabled
- Statistics should facilitate policy decision making
- Collaboration between agencies is needed

In the current context, by far the most important barrier concerns the confidentiality of information and the related issue of the maintenance of privacy.

In a complementary initiative to the consultation exercise described above, NVCH (2000) point to some of barriers which face the process of generating a more integrated, useful and ICT based health statistics infrastructure. Among the more important barriers are:

- The concept of health - here there is concern about adequately reflecting positive indicators of health, as well as the more usual indicators of ill health, in the statistics infrastructure.
- Privacy protection - ensuring the privacy of health record data is a paramount concern, but difficult to absolutely achieve in practice.
- Information as both a private resource and a public good - there is a need to balance privacy concerns with the public good which can come from having more integrated health statistics.
- Lack of standards - there is a lack of standards in relation to both the definition of health indicators and to the technology standards which relate to the ICT infrastructure which might carry them.
- Quality standards for online information - current health related websites have insufficient quality standards, thereby reducing the reliability, usability, utility and usage of these websites.
- Technology security - it is unclear whether current technologies can provide adequate levels of security to cover he special needs of health related data.
- Costs - the costs of implementing a suitable health statistics infrastructure using ICTs are very large. This is likely to lead to slow uptake of any proposals which are made.
- Attitudes and practices - practitioners in the area of health often have negative attitudes towards the provision of sensitive patient record data, especially through the medium of ICTs. In addition, by no means all practitioners are familiar with or habitually use ICTs in the course of their work, even if they have relatively positive attitudes towards them.

Many Member States also have comparable health statistics initiatives underway. These include the UK, where such an initiative has been running since the mid-1980's. Similar concerns have emerged from these national initiatives.

The implication of these initiatives for the eHealth action plan are perhaps not immediate, as the time needed to roll out such comprehensive redesigns of national health statistics and indicators tends to be very long. However, it seems clear that as these initiatives become more established that there will be a need to develop new indicators which reflect these major changes.

3 Statistical indicators for eHealth

This chapter examines currently available statistical indicators for charting the development of eHealth. It also identifies, using the framework developed in Chapter 2, gaps in these currently available indicators. The Chapter concludes with proposals for developing a new set of indicators for use in the future.

3.1 Sources of indicators

Despite the wide range of health statistics available, there are relatively few sources of indicators in the field of eHealth which have achieved widespread usage. Time series data is not (yet) available for any of the indicators found. This means that all of them belong, according to the classification used for some of the other SIBIS Topics, to the category of "indicators in development".

Moreover, many of the sources which have come to attention are relatively weak. For example, there are only a few surveys which have used robust sampling techniques while many surveys have been conducted only on the Internet, with attendant biases in their sampling.

However, given the scarcity of sources available, both types of question or indicator have been included, though appropriate care should be taken when using some of the weaker indicators.

The overall impression regarding the state of existing indicators is that there is much work to be done in relation to a wide range aspects of eHealth. For example, the framework proposed in Chapter 2 points to a number of areas where there is activity in eHealth, e.g. education, for which no or very few indicators could be found.

What follows then is a listing of available indicators of varying degrees of quality, which address only limited areas of eHealth applications.

The following are some of the sources which have been have been used to identify the indicators which are described in detail in this Chapter.

Eurobarometer (2000). EU General Practitioners and their ICT usage.

The results from this survey were only available to the project in a preliminary format. Nevertheless the questionnaire provides a useful source of indicators with regard to professional usage of ICT, and it therefore provides in combination with the SATS study and some more limited Internet based surveys, a useful summary of the indicators which have been used in this context to date. This was survey of 500 or 1000 professionals in each of the EU Member States conducted via telephone interview.

HON – Health online. Healthcare professionals experience of using the medical Net. http://www.hon.ch/survey/resPoll/Total.html

This internet survey examined physicians usage of the internet - specifically their usage of health information systems. In addition, it asked about the how useful they found patients usage of eHealth systems to be in their clinical work. Though limited in scope and sampling, it provides some indicators which may be of significance. The survey was carried on the Internet from May to July 2000 and received 1129 responses from professionals in the US and Europe.

Empirica and WRC (2000). Study on the use of advanced telecommunications services by health care establishments and possible implications for telecommunications regulatory policy of the European Union (SATS). Final report. Bonn, Dublin.

This study of practitioners usage of ICT in health care used an interview format to make its investigations. Much of the study was concerned with establishing interrelationships between health care agencies, but a significant part was concerned with describing the type of ICT usage by a range health care providers and the purposes of ICT usage. The most relevant issues from the instrument used in this study have been adapted for proposed usage as indicators of eHealth. The original study used a methodology whereby expert national correspondents provided information on their country in relation to a structured protocol.

HON (1999). Survey on internet usage for medical and health purposes. HON Foundation

This survey instrument from the Health On Line Foundation examined the general public's and practitioners usage of Internet based health information. It asked questions in relation to the following five areas:

- Attitudes towards health information on the internet
- Specific information searches
- Patients usage of health sites
- Providers usage
- Type of usage - specific searches

The study was due to be carried out via the Internet amongst users of the Health On Line Foundation site in 2000. Results had not been published at time of writing.

BioInformatics Inc (1998). Trends in telemedicine: Competing in a convergent market. BioInformatics Inc., Bethesda, Maryland.

This document reports on an online survey of health professionals in the US and Europe (369). It asked them about trends in the market for telemedicine. In all 36 separate questions were asked, though not all of them are relevant in the current context.

SciPICH (2001). Interactive health communication. Washington.

This paper presents an evaluation template for assessing interactive health communication applications. Three headings are used:

- Description of application (12 items)
- Formative and process evaluation (9 items)
- Outcome evaluation (9 items)
- Background evaluators (4 items)

It also provides an IHC checklist dealing with:

- Background of developers/sponsors (4 items)
- Purpose (3 items)
- Content (4 items)
- Confidentiality (2 items)
- Design (3 items)
- Evaluation results and effectiveness (4 items)

These items are presented in the form of a detailed questionnaire. However, it is not clear if they have been used in any type of investigation as yet.

eEurope 2002 - eHealth - Quality Criteria report

This Commission sponsored initiative mirrors the concerns of the SCiPICH report outlined above. It has developed a less detailed set of criteria for the evaluation of health information web sites. So far as this author is aware, these criteria have not yet been used in any wide scale investigation. However, the criteria have been drawn upon in describing currently available indicators.

3.2 Structure of eHealth indicators

The indicators described in the Tables in Annex 1 are organized according to the following structure:

1. System quality
    - 1.1 Background of system developers/sponsors
        - 1.1.1 Identity of developers and sponsors
        - 1.1.2 Developers level of expertise
        - 1.1.3 Mechanisms to contact developers
        - 1.1.4 Disclosure of conflicts of interest
        - 1.1.5 Identification of authors
        - 1.1.6 References to sources of content
        - 1.1.7 Identification of opinions
        - 1.1.8 Credentials of the authors
        - 1.1.9 Relationship between authors credentials and content area
        - 1.1.10 Relevance of authors experiences
        - 1.1.11 Methods of contacting authors
        - 1.1.12 Identification of sponsors of the website
        - 1.1.13 Explanation of financial conflict or bias
        - 1.1.14 Control of content by sponsors
    - 1.2 Purpose of the application
        - 1.2.1 Statement of purpose of the application
        - 1.2.2 Statement of intended audiences and health issues
        - 1.2.3 Fit between purpose and probable user needs
    - 1.3 Content of the application
        - 1.3.1 Original source of content
        - 1.3.2 Reliability and bias of original content
        - 1.3.3 Updating of content
        - 1.3.4 Reasonableness of ensuring content validity
        - 1.3.5 Methods of identifying currency of information
        - 1.3.6 Currency of information
        - 1.3.7 Relevance of information
        - 1.3.8 Assessment of quality of medical information
        - 1.3.9 Balance and neutrality of medical information
        - 1.3.10 Currency of linked sites
        - 1.3.11 Assessment of quality of information on linked sites
    - 1.4 Confidentiality procedures
        - 1.4.1 Specification of confidentiality procedures
        - 1.4.2 Specification of access to information about users
        - 1.4.3 Confidentiality of information inputs

1.5 Design of the web site
- 1.5.1 Ease of use
- 1.5.2 Appropriateness of design for intended users
- 1.5.3 Special or high technology requirements
- 1.5.4 Ease of navigability of site
- 1.5.5 Utility of search engine

1.6 Evaluation of the web site
- 1.6.1 Provision of evaluation results

2. System usage

2.1 Barriers to system usage
- 2.1.1 Obstacles to website usage
- 2.1.2 Shortcomings of eHealth systems

2.2 Patients and public usage of eHealth systems
- 2.2.1 Patients discussing net based health care information
- 2.2.2 Usefulness of patients usage of eHealth systems
- 2.2.3 Communications with health care practitioners
- 2.2.4 Types of communications with health care practitioners
- 2.2.5 Experiences of eHealth systems usage
- 2.2.6 Types of patient usage of eHealth systems
- 2.2.7 Patients usage of information obtained on eHealth systems
- 2.2.8 General public sources of healthcare information
- 2.2.9 General public types of health information sought
- 2.2.10 General public preferences for sponsorship of eHealth sites
- 2.2.11 General public: target person for health information sought

2.3 Practitioners usage of eHealth systems
- 2.3.1 Sources of medical information
- 2.3.2 Frequency of usage of sources of medical information
- 2.3.3 Type of ICT usage
- 2.3.4 Usage of the Internet
- 2.3.5 Preferred Internet applications
- 2.3.6 Adequacy of time available for Internet usage
- 2.3.7 Level of access to ICT applications
- 2.3.8 Types of ICT applications used in the health care sector
- 2.3.8 Involvement in telemedicine
- 2.3.9 Length of Involvement in telemedicine
- 2.3.10 Current usage of telemedicine
- 2.3.11 Current usage of telemedicine
- 2.3.12 Medical specialties supported by telemedicine
- 2.3.13 Types of telecommunications technology application
- 2.3.14 Types of medical information transmitted
- 2.3.15 Reasons for undertaking telemedicine
- 2.3.16 Utility of telemedicine for specific health/medical areas
- 2.3.17 Usage of telemedicine for administrative applications
- 2.3.18 Usage of telemedicine for clinical applications
- 2.3.19 Usage of electronic medical information
- 2.3.20 Usage of telemedicine for remote patient assessment
- 2.3.21 Usage of telemedicine for consultation with care giver
- 2.3.22 Usage of telemedicine for remote observation of procedures
- 2.3.24 Usage of telemedicine for patient monitoring
- 2.3.25 Usage of telemedicine for image transmission
- 2.3.26 Concerns about telemedicine usage
- 2.3.27 Organisational web sites for health information dissemination
- 2.3.28 Usage of e-mail for clinical instructions
- 2.3.29 Usage of interactive video/TV for medical education
- 2.3.30 Usage of WWW for medical education
- 2.3.31 Beliefs about utility of telemedicine in health care
- 2.3.32 Organisational problems in telemedicine growth

	HYPERLINK
	HYPERLINK

4 Proposals for new indicators for eHealth

This chapter makes some proposals for new ehealth indicators which might be used in the SIBIS surveys.

As indicated previously, there is a wide range of areas of eHealth which have not been adequately covered by indicators which might be used in describing the systems, applications and usage of these technologies. However, it is not the intention here to be exhaustive in making such proposals.

Aside from the SIBIS surveys and SIBIS work, there is a need to develop new indicators of eHealth systems which could provide valuable information to policy makers, practitioners, the general public and patients. However, making such proposals could be an exhaustive and extensive process, bearing in mind the sheer range of health statistics which already exist which may migrate to eHealth systems. It is therefore necessary to adopt a perspective when doing so which will serve the function of focusing the proposed indicators on the more important current and upcoming issues in e-Health.

This process of selection is informed by three considerations. First, the framework for describing eHealth indicators is used as a reference to identify potential gaps in coverage of issues in eHealth. Second, the review of important current issues in eHealth is used as a reference to identify gaps in coverage by the currently available indicators. Finally, the criterion of focusing on usage of eHealth systems, rather than their information content is used to further limit the proposals for new indicators.

4.1 Current indicators related to the framework

The framework for describing eHealth indicators identifies five major dimensions of relevance. These are:

- Users
- Usage
- Systems
- Issues
- Questions

In relation to users of eHealth systems, all of the indicators located so far have as their target groups either practitioners, patients and/or the general public. No indicators have been located which target educational support service users, purchasers and reimbursers and users from the policy or health administration areas.

With regard to the 5 dimensions of usage, only one of the dimensions - information acquisition - could be said to be reasonably well covered by the existing indicators. In fact, the vast majority of existing indicators are concerned with this issue. No adequate coverage exists with regard to the other types of usage - clinical investigation, education, information transmission, or support provision.

There are 12 different elements to the systems dimension outlined in the framework. Of these, only two are covered in any detail by the existing indicators. These are the systems concerned with patient-practitioner consultation which is covered only briefly, and the provision of online health information. The remaining 10 elements (see below) are either not covered at all or only covered inadequately by the existing indicator set.

- Practitioner-practitioner consultation

- Clinical investigations in health care
- Remote monitoring of patients
- Remote diagnosis in health care
- Remote treatment in health care
- Facilities management of remote health care services
- Providing information to patients
- Continuing education to practitioners
- Transfer of information throughout health care services
- The exchange of patient data

Five main issues of interest are identified in the fourth dimension of the framework. These are the issues of quality, privacy, confidentiality, reliability and effectiveness. These issues are covered relatively well in the existing indicators, especially in the indicators emanating from attempts to establish quality criteria for health related websites. However, it should be emphasised that these issues are covered only in relation to a relatively small set of eHealth systems and with only a limited set of target users.

The final dimension of the framework is concerned with the types of questions which might be asked. Here, ten distinct types of questions are proposed. Of these, the most commonly asked types of questions concern confidentiality, privacy, usability and to some extent, reliability. Very few indicators are concerned with the other six elements, which are:

- Efficacy
- Practicality
- Value added
- Clinical utility
- Cost
- Satisfaction

As with the other dimensions, even those indicators which have been used are not applied to all other dimensions. For example, the indicators which have been developed in relation to confidentiality and privacy, have been within the context mainly of online health information systems, and have not been related to, for example, remote treatment systems, educational usage, or health administrations.

4.1.1 Important issues in eHealth

The most important issues identified in the review of literature earlier in the Deliverable are:

- Privacy
- Confidentiality
- Reliability
- Effectiveness

In addition, the review of important eHealth and other health policies carried out identified a number of broader health policy issues of importance. These are:

- Legal and regulatory issues
- Quality issues
- Development of best practice and benchmarking
- Interoperability of eHealth systems

- Promotion of public access to eHealth systems

These issues which are prevalent in the policy debate are, of course, discussed at a relatively high level. They are therefore difficult to operationalise into well defined indicators. For example, the Commissions policy drive to promote public access to eHealth systems is difficult to operationalise to a level of detail which might be used to generate indicators. On the other hand, the Commissions policy on identifying best practice and benchmarks for best practice holds considerable promise for the development of new indicators. However, at time of writing, no such indicators have emerged from this policy drive.

Comparing these issues to the indicators which are currently available, shows that some of these concerns have been covered reasonably adequately. In particular, the issues of privacy and confidentiality and that of eHealth system quality have been addressed. However, issues such as the effectiveness of eHealth systems have not been adequately covered by existing indicators. Moreover, the public policy concerns outlined above do not deal with many of the issues depicted in the framework. So, for example, there appears to be no reference in policy statements to educational issues, sites which provide support for special interest groups, or the usage of eHealth systems in clinical practice.

4.1.2 Gaps in current coverage

There are two main types of gap in relation to currently available indicators. Firstly, none of the existing indicators have yet been used in repeated manner - there are no time series data available at this point. Secondly, there are gaps in relation to the coverage of important eHealth issues, as identified in the previous two sections. It is only with the latter type of gap that the current analysis is concerned.

The above comparisons between the framework for eHealth system usage, the currently available set of indicators and current policy concerns point to some broad areas where indicators are lacking, especially within the context of current initiatives by policy makers on both sides of the Atlantic. Chief among these are the following areas:

- Benchmarking good practice
- The utility or effectiveness of eHealth systems
- Satisfaction with eHealth systems

In addition, it is clear from the above analysis that most indicators focus either on the general public/patients or on practitioners as a target group. There is a clear need to broaden the type of target groups which are the focus of indicators to include such groups as people working in health administrations, reimbursement agencies and educational services.

There are many other gaps in coverage by current indicators other than those identified in this section. Ultimately, it is important to develop indicators of eHealth system usage which begin to complete the framework described in Chapter 2. However, it is beyond the scope of the SIBIS project to undertake such exhaustive development.

For the proposed indicators outlined below, no response categories have been proposed. This is because the appropriate type of response category depends on a number of factors such as the target group for the investigation and the methodology used (e.g. telephone interview, self report surveys). However, the definitions of the indicators have been framed as far as is possible as to pint to fairly obvious response categories.

4.2 Proposals for new indicators

Based on the preceding analysis, the following indicators are proposed, below. These should be viewed in conjunction with each other and form a comprehensive whole The last three subtopics, while not appropriate to be developed for usage in Sibis surveys, are considered as being of sufficient importance to warrant inclusion in this outline (and further development elsewhere). Hence their elaboration in subsections to follow 4.2.1, 4.2.2, and 4.2.3, while the indicators deemed appropriate for Sibis surveys are operationalised to the level of survey questions (section 4.3).

Figure 4-1. Sibis ehealth indicators summarised

Thematic domain	Sub topics	Selected new indicators	SIBIS Pilot
e-Health and the information society	Accessing Internet based health information	• Description of search behaviour • Outcomes of search behaviour • Satisfaction with outcomes of search behaviour	GPS
	Origin of internet based health information	• Geographical origin of internet based health information	GPS
	Perception regarding the trust placed in online health information providers	• Levels of trust in commercial, professional and other health information providers	GPS
	Type of usage of Internet based health information	• Usage of medical consultations/advice via the internet	GPS
	Rationale and reasons for health information search	• Types of reason for health information search • Comparison of quality of internet based health information with traditional sources	GPS
	Type of system used	• Individual usage of a range of eHealth and telemedicine systems	GPS
	Benchmarking good practice (All indicators to be compared to best practice)	• Comparisons of the usability, utility, effectiveness quality and conformance with best practice in relation to eHealth systems	Not used
	The utility or effectiveness of eHealth systems	• The effectiveness of eHealth systems in relation to costs, information quality and time	Not used
	Satisfaction with eHealth systems	• Satisfaction with the utility and effectiveness of eHealth systems	Not used

4.2.1 Benchmarking good practice.

There are as yet no clear guidelines emerging from the Commissions policy initiative on benchmarking of good practice. This makes it difficult to propose definitive indicators at this stage. However, based on currently available literature it is possible to make the following proposals in this area. It should be noted that some of the indicators proposed below are partially covered by existing indicators

Table. Proposed indicators of benchmarks of good practice in eHealth systems

Indicator	Potential target groups	Definition

Design for all	General public, patients, practitioners, administrators, educators	• Does the ehealth system enable people of all abilities to use it effectively • Have the principles of Design For All been used in constructing the system ?

Satisfaction	General public, patients, practitioners, administrators, educators	• How satisfied are you with the following aspects of the system ?
		  • the usefulness of the system
		  • how easy the system is to use
		  • the information you obtained on the system
		  • procedures for confidentiality and privacy
		  • the support you received from the system
		  • the benefits you received from using the system
		  • The costs of using the system
		• Would you use the system again ?
		• Would you recommend others to use the system ?
		• Overall, how satisfied were you with your usage of the system ? (5 point satisfaction scale)

Utlity	General public, patients, practitioners, administrators, educators	• To what extent does the system meets its objectives ? • To what extent does the system meet your objectives in using it ? • Is the system more useful than alternative methods ?

Accessibility	General public, patients, practitioners, administrators, educators	• How did you find out about the eHealth system ? • How easy was the system to access ? • How many people have access to the system ? • What additional groups could usefully have access to the system ? • Approximately what percentage of the target group for the system have access ?

Indicator	Potential target groups	Definition

Usability	General public, patients, practitioners, administrators, educators	• How usable did you find the following aspects of the system ?
		  • the navigation system
		  • the help system
		  • the interface
		  • tables
		  • graphics
		  • video clips
		  • links
		  • site map
		  • search engine

Cost effectiveness	General public, patients, practitioners, administrators, educators	• Compared to alternative systems, was the system more or less effective in terms of costs ?
		• Compared to alternative systems, was the system more or less effective in terms of time ?
		• Would you recommend others to use the system on the basis of its cost-effectiveness ?
		• Dou you think that the costs of the system, when compared to its effectiveness, are ?
		  • Excessive
		  • about right
		  • under costed

Content quality	General public, patients, practitioners, administrators, educators	• Is the content of the system reliable ? • Is the content of the system validated ? • Is the content of the system updated regularly ? • Is the content of the system appropriate for its purpose ? • Are the authors of the system content identified ?
Interoperability	General public, patients, practitioners, administrators, educators	• How easily does the eHealth system link with your existing systems ?

4.2.2 The utility or effectiveness of eHealth systems

The utility or effectiveness of an eHealth system may be interpreted in at least two ways. Firstly, there is the issue whether the system meets its objectives, i.e. is it fit for its purpose. Secondly, the issue of effectiveness may be related to the user, i.e. is the system effective in meeting the users needs. Both of these interpretations are reflected in the proposed indicators et out in the Table below.

The issue of cost-effectiveness is a related and important one here. However, it is not intended to develop indicators which seek to measure cost-effectiveness in rigorous terms. That is essentially an accountancy exercise, which while valuable, is beyond the scope of survey indicators which is the concern of the SIBIS project. However, the perception of cost-effectiveness is also important, and this concern is also reflected in the table below.

Table. Proposed indicators of cost effectiveness of eHealth systems

Indicator	Potential target groups	Definition
Usage costs	General public, patients, practitioners, administrators, educators	• How much does it cost to use the system ? • How much does it cost to purchase the system ?
System objectives	General public, patients, practitioners, administrators, educators	• What is the purpose of the eHealth system ? • What are the objectives of the eHealth system ? • What are your objectives in using the system ? (e.g. information acquisition, information transmission, clinical usage types)
System effectiveness	General public, patients, practitioners, administrators, educators	• To what extent does the system meet its objectives ? • To what extent does the system meet your objectives ?
Financial cost effectiveness	General public, patients, practitioners, administrators, educators	• To what extent is the system cost effective in financial terms ? • Have formal cost-effectiveness studies been carried out in your organisation in relation to the eHealth system ? • Would you recommend this eHealth system to others on financial cost-effectiveness grounds ?
Time cost effectiveness	General public, patients, practitioners, administrators, educators	• Is this eHealth system more effective than alternatives in relation to the time you spend using it ?

4.2.3 Satisfaction with eHealth systems

The set of currently available indicators, rather surprisingly, does not deal with the issue of satisfaction with eHealth systems in any systematic manner. This is despite the fact that there is long tradition of assessing levels of user satisfaction with a wide range of aspects of ICT systems (see for example, usability research). This work on user satisfaction provides a sufficient level of detail to enable the development of many indicators of satisfaction with eHealth systems.

However, it is not proposed to enter into such a level detail here. Rather it is proposed to provide some general level indicators of satisfaction, with particular reference to the usage of

eHealth systems by different target groups. Such high level indicators would enable a wide ranging assessment of current levels of satisfaction among the most important stakeholders and users of eHealth systems.

This satisfaction indicator may be applied to almost any aspect of any eHealth system. Generic questions about the target groups satisfaction with a wide range of elements of an eHealth system may be asked. The following listing focuses only on some of the more generic aspects of satisfaction with eHealth systems.

Table. Proposed indicators of satisfaction with of eHealth systems

Indicator - Satisfaction with:	Potential target groups	Definition
• Access • Effectiveness • Usefulness • Interface • Content • Costs • Difficulty • Ease of use • Support received • Quality of information • Reliability of information	General public, patients, practitioners, administrators, educators	• How satisfied are you with the following aspects of the system ? (5 point satisfaction scale) • Overall, how satisfied are you with your usage of the system ?

4.3 Proposals for SIBIS surveys

The SIBIS project will conduct surveys of decision makers in enterprises (DMS) and of the general public (GPS) in relation to a wide range of aspects of eEurope. Included will be questions on such areas as e-commerce, transport, smart cards and eGovernment. There is therefore limited scope to include large numbers of eHealth related questions.

There is also the consideration of the target groups to be questioned in the surveys. Many of the possible eHealth indicators are most properly addressed to practitioners and professionals in the field. For example, questions about remote monitoring of patients, assistance to diagnostic processes and medical image transmission are best left to the professionals rather than the general public.

Accordingly, the questions and indicators outlined below are targeted only at the general public and to decision makers, i.e. only to the informed layman rather than the professional classes.

In addition, because of constraints on the number of questions which may feasibly be asked in interviews, only two questions are proposed. These have been selected because they have the potential to be used to establish representative baselines about some of the basic issues in eHealth, something which has not yet been adequately done.

The following questions are proposed for conclusion in the DMS and GPS surveys:

Module: ICT equipment access to and use of online health information		**GPS**
To follow on from Use of computer and online access: Have you searched for any health related information on the Internet in the last (period of time….)?	(a) yes Have you been able to find / access health related information (yes / no) ? if YES (ii) Were you generally happy with the suitability of health related information that you found on the Internet (yes / no) or was the information suitable for your needs (yes / no)? (b) no (c) DK	
The origin of health information on the internet (country domain)?	In terms of the origin of the sites featuring health related information (a) (Web)Sites from my own country of origin were sufficient (b) Had to expand my search and consult international sites / sites from other countries too (c) Had to rely solely on international / foreign sites (d) DK	
Perception regarding the trust placed in online health information provider (please select one ?/ more than one ?/ list in order of trust from one to eight – preferred option, but might be too demanding on the respondent)	I tend to trust more the health related information provided by (a) Non – profit organisation (active in health area) (b) pharmaceutical companies (c) private health insurance providers (d) patient advocacy / support groups (e) hospitals (f) commercial companies (active in health area) (g) professional medical associations (h) online / electronic versions of medical literature that was familiar with / exists in the printed format (e.g. medical encyclopaedia, journals, etc)	Adapted and expanded from HON
Use of information found:	(a) used / had an on-line medical consultation (yes / no) (b) discussed information found on the internet with my GP / family doctor/ specialist (yes / no)	

<u>Rationale for health info search?</u> (a) online versus health information from traditional sources	(a) Seeking second opinion on own / family member / friend medical diagnosis (yes / no) (i) if yes, did you find the Internet based information useful? (yes / no) 1. how did internet based information compare with 'primarily' given information (e.g. by GP, specialist) or information available from other traditional sources? 2. It was essentially the same 3. It was similar but more detailed 4. It differed somewhat 5. It was very / completely different (b) Wanted to be better informed on general health (c) needed additional information since I care for ill person / person with disability	Suggested by WRC
<u>Type of system used / type of usage</u> For what reasons did you use the eHealth system (yes / no)?	To consult my doctor/practitioner To obtain health information To obtain support from fellow patients As part of the treatment process (self / family member / friend) To further my education To arrange appointments To view my medical record electronically (only relevant for countries with a unique health identifier / relevant for pilot projects in the are – narrow audience)	
What type of eHealth system did you use ?	Patient-practitioner consultation Practitioner-practitioner consultation Clinical investigations in health care Remote monitoring of patients Remote diagnosis in health care Remote treatment in health care Facilities management of remote health care services Providing information to patients Continuing education to practitioners Transfer of information throughout health care services On-line health information The exchange of patient data Patient support groups	

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Annex 1 : eHealth Indicators sourced and described in detail

1.1 System quality - Background of system developers/sponsors

Name of indicator	**1. System quality:** **1.1 Background of system developers/sponsors** **1.1.1 Identity of developers and sponsors**
Definition	Is the identity of the developers and sponsors clearly stated ?
Notes	Not known if indicators yet used
Sources	SciPICH. http://www.health.gov/scipich/IHC/default.htm
Countries covered	Not availablee
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality:** **Background of system developers/sponsors** **1.1.2 Developers level of expertise**
Definition	Do the developers have expertise (or use experts) in the content area ?
Notes	Not known if indicators yet used
Sources	SciPICH. http://www.health.gov/scipich/IHC/default.htm
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	1.1.2,1.1.8,1.1.10

Name of indicator	**1. System quality:** **Background of system developers/sponsors** **1.1.3 Mechanisms to contact developers**
Definition	Is there a mechanism to contact developers
Notes	Not known if indicators yet used
Sources	SciPICH. http://www.health.gov/scipich/IHC/default.htm
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality:** **Background of system developers/sponsors** **1.1.4 Disclosure of conflicts of interest**
Definition	Does the application disclose any potential conflicts of interest or biases of the developers and sponsors
Notes	Not known if indicators yet used
Sources	SciPICH. http://www.health.gov/scipich/IHC/default.htm
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	1.1.12, 1.1.13, 1.1.14

Name of indicator	**1. System quality:** **Background of system developers/sponsors** **1.1.5 Identification of authors**
Definition	Is the author identified in the article ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality:** **Background of system developers/sponsors** **1.1.6 References to sources of content**
Definition	When the author refers to another source, are the appropriate references provided ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality:** **Background of system developers/sponsors** **1.1.7 Identification of opinions**
Definition	Is the author referring to a source, does he/she clearly state that it is only his/her opinion ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality:** **Background of system developers/sponsors** **1.1.8 Credentials of the authors**
Definition	Are the site authors credentials listed ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	1.1.2,1.1.9,1.1.10

Name of indicator	**1. System quality:** **Background of system developers/sponsors** **1.1.9 Relationship between authors credentials and content area**
Definition	Does the site authors credentials relate to the knowledge of the field that is required for the site's subject discussions ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	1.1.2,1.1.8,1.1.10

Name of indicator	**1. System quality:** **Background of system developers/sponsors** **1.1.10 Relevance of authors experiences**
Definition	Are the authors experiences relevant to the topic ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	1.1.2, 1.1.9, 1.1.8

Name of indicator	**1. System quality:** **1.1. Background of system developers/sponsors** **1.1.11 Methods of contacting authors**
Definition	Is a means provided to contact the author directly ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality:** **Background of system developers/sponsors** **1.1.12 Identification of sponsors of the website**
Definition	Can you identify who has paid for or sponsored the website ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	1.1.4, 1.1.13, 1.1.14

Name of indicator	**1. System quality:** **Background of system developers/sponsors** **1.1.13 Explanation of financial conflict or bias**
Definition	Is any financial conflict or bias explained ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	1.1.12, 1.1.4, 1.1.14

Name of indicator	**1. System quality:** **Background of system developers/sponsors** **1.1.14 Control of content by sponsors**
Definition	Does the site state that contributors or sponsors have no control over the content ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	1.1.12, 1.1.13, 1.1.4

1.2 System quality - Purpose of the application

Name of indicator	**1. System quality:** **1.2 Purpose of the application** **1.2.1 Statement of purpose of the application**
Definition	Does the application state its specific purpose
Notes	Not known if indicators yet used
Sources	SciPICH. Http://www.health.gov/scipich/IHC/default.htm
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality:** **Purpose of the application** **1.2.2 Statement of intended audiences and health issues**
Definition	Does the application state the intended audiences and specific health issues it addresses
Notes	Not known if indicators yet used
Sources	SciPICH. Http://www.health.gov/scipich/IHC/default.htm
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality:** **1.2 Purpose of the application** **1.2.3 Fit between purpose and probable user needs**
Definition	Does the application's purpose and objectives match the likely needs of its intended users
Notes	Not known if indicators yet used
Sources	SciPICH. http://www.health.gov/scipich/IHC/default.htm
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

1.3 System quality - Content of the application

Name of indicator	**1. System quality:** **Content of the application** **1.3.1 Original source of content**
Definition	Is the original source of the content identified
Notes	Not known if indicators yet used
Sources	SciPICH. http://www.health.gov/scipich/IHC/default.htm
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality:** **1.3 Content of the application** **1.3.2 Reliability and bias of original content**
Definition	Is the original source of content likely to be reliable and without bias
Notes	Not known if indicators yet used
Sources	SciPICH. http://www.health.gov/scipich/IHC/default.htm
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality:** **1.3 Content of the application** **1.3.3 Updating of content**
Definition	Is the content updated sufficiently to ensure that it is accurate and up to date
Notes	Not known if indicators yet used
Sources	SciPICH. http://www.health.gov/scipich/IHC/default.htm
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	1.3.5, 1.3.6

Name of indicator	**1. System quality:** **1.3 Content of the application** **1.3.4 Reasonableness of ensuring content validity**
Definition	Is the applications method of ensuring the validity of its content reasonable
Notes	Not known if indicators yet used
Sources	SciPICH. http://www.health.gov/scipich/IHC/default.htm
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality:** **1.3 Content of the application** **1.3.5 Methods of identifying currency of information**
Definition	Is there a means to determine how current the information on the website is, e.g. date of last update or posted date ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	1.3.3

Name of indicator	**1. System quality:** **1.3 Content of the application** **1.3.6 Currency of information**
Definition	Is the information current ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	1.3.3, 1.3.5

Name of indicator	**1. System quality:** **1.3 Content of the application** **1.3.7 Relevance of information**
Definition	Is the information still relevant ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality:** **1.3 Content of the application** **1.3.8 Assessment of quality of medical information**
Definition	From your own knowledge and experience, does this site give good medical information ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality:** **1.3 Content of the application** **1.3.9 Balance and neutrality of medical information**
Definition	Is the medical information presented in a balanced and neutral form?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality:** **1.3 Content of the application** **1.3.10 Currency of linked sites**
Definition	Are the linked sites current ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality:** **1.3 Content of the application** **1.3.11 Assessment of quality of information on linked sites**
Definition	Do the linked sites give good medical information ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

1.4 System quality - Confidentiality procedures

Name of indicator	**1. System quality:** **1.4 Confidentiality procedures** **1.4.1 Specification of confidentiality procedures**
Definition	Does the application specify whether and how users confidentiality and anonymity is protected
Notes	Not known if indicators yet used
Sources	SciPICH. http://www.health.gov/scipich/IHC/default.htm
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality:** **1.4 Confidentiality procedures** **1.4.2 Specification of access to information about users**
Definition	Does the application specify who has access to information about users
Notes	Not known if indicators yet used
Sources	SciPICH. http://www.health.gov/scipich/IHC/default.htm
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality:** **1.4 Confidentiality procedures** **1.4.3 Confidentiality of information inputs**
Definition	If you are allowed to input information or submit queries, is a statement provided that explains whether or not this information is confidential and secure ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

1.5 System quality - Design of the website

Name of indicator	**1. System quality** **1.5 Design of the website** **1.5.1 Ease of use**
Definition	Is the application easy to use
Notes	Not known if indicators yet used
Sources	SciPICH. http://www.health.gov/scipich/IHC/default.htm
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality** **1.5 Design of the website** **1.5.2 Appropriateness of design for intended users**
Definition	Are the reading/comprehension level, graphics, audio and other multimedia features appropriate for the intending user
Notes	Not known if indicators yet used
Sources	SciPICH. http://www.health.gov/scipich/IHC/default.htm
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality** **1.5 Design of the website** **1.5.3 Special or high technology requirements**
Definition	Does it require special or high level technology
Notes	Not known if indicators yet used
Sources	SciPICH. http://www.health.gov/scipich/IHC/default.htm
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality** **1.5 Design of the website** **1.5.4 Ease of navigability of site**
Definition	Is the site easily navigable and presented in an organised manner ? Is a search engine provided ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

Name of indicator	**1. System quality** **1.5 Design of the website** **1.5.5 Utility of search engine**
Definition	Does the search engine assist you in using the site ?
Notes	Not known if indicators yet used
Sources	Health Summit Working Group – Information Quality tool - http://www.hitiweb.mitretek.org/iq/questions.asp
Countries covered	Not applicable
Time series available	Not available
eEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

1.6 System quality - Evaluation of the website

Name of indicator	**1. System quality** **1.6 Evaluation of the website** **1.6.1 Provision of evaluation results**
Definition	Do the developers provide any evaluation results about the effectiveness or impact of the application in the following areas: • Usability of application • User satisfaction • Changes in user knowledge and attitudes • Changes in health status • Changes in health behaviours • Changes on costs or use of resources
Notes	Not known if indicators yet used
Sources	SciPICH. http://www.health.gov/scipich/IHC/default.htm
Countries covered	Not applicable
Time series available	Not available
EEurope relevance	Quality assessment of eHealth sites
Links to other indicators	-

2.1 Barriers to system usage

Name of indicator	**2. System usage** **2.1 Barriers** **2.1.1 Obstacles to website usage**
Definition	What are the obstacles you face when using the Web today ? • Insufficient IT training • Lack of time • Inadequate tools and applications • Dissatisfied with information quality • Poor security for medical data • Internet is a low priority in my organisation
Notes	Used in an Internet survey of medical practitioners
Sources	HON – Health online. http://www.hon.ch/survey/resPoll/Total.html
Countries covered	Not specified
Time series available	Unavailable
eEurope relevance	-
Links to other indicators	-

Name of indicator	**2. System usage** **2.1 Barriers** **2.1.2 Shortcomings of eHealth systems**
Definition	What are the shortcomings of e-health as you have experienced it so far ? • Too much hype • Too little quality • Excessive commercial emphasis • Dangerous misinformation • Time wasting searches
Notes	-
Sources	HON – Health online. http://www.hon.ch/survey/resPoll/Total.html
Countries covered	Not specified
Time series available	Unavailable
eEurope relevance	-
Links to other indicators	-

2.2 Patients usage of eHealth systems

Name of indicator	**2 System usage** **2.2 Patients usage of eHealth systems** **2.2.1 Patients discussing net based health care information**
Definition	Do your patients discuss healthcare information they have found on the Net with you
Notes	-
Sources	HON – Health online. http://www.hon.ch/survey/resPoll/Total.html
Countries covered	Not applicable
Time series available	No
eEurope relevance	Relevant to the views of the general public regarding eHealth information systems
Links to other indicators	-

Name of indicator	**2 System usage** **2.2 Patients usage of eHealth systems** **2.2.2 Usefulness of patients usage of eHealth systems**
Definition	Is patients usage of eHealth systems helpful ? (Yes/No) This is helpful because: • Communication is improved • Patient grows more knowledgeable • Patients becomes a better 'partner' • Consultation is constructive This is not helpful because: • Waste of time • Creates mistrust • Loss of physician control • Risk of patient self treatment
Notes	-
Sources	HON – Health online. http://www.hon.ch/survey/resPoll/Total.html
Countries covered	Not applicable
Time series available	No
eEurope relevance	Relevant to the views of the general public regarding eHealth information systems
Links to other indicators	-

Name of indicator	**2. System usage** **2.2 Patients usage of eHealth systems** **2.2.3 Communications with health care practitioners**
Definition	What types of health care practitioner do you have communications with? • GPs/primary care clinic • Specialists • Hospital out-patients clinics • Hospital day patients clinics • Hospital in-patients • Pharmacists • Laboratories • Reimbursers • Public health administration
Notes	Taken from face to face interview protocol
Sources	SATS study
Countries covered	EU-15
Time series available	No
eEurope relevance	Patient usage perspective on e-health systems
Links to other indicators	-

Name of indicator	**2. System usage** **2.2 Patients usage of eHealth systems** **2.2.4 Types of communications with health care practitioners**
Definition	What types of communication do you typically have with these practitioners? • Appointment making • Opening hours information • Prescription information • Clinical advice • Making complaints
Notes	Taken from face to face interview protocol
Sources	SATS study
Countries covered	EU-15
Time series available	No
eEurope relevance	Patient usage perspective on e-health systems
Links to other indicators	-

Name of indicator	**2. System usage** **2.2 Attitudes towards Internet based eHealth systems** **2.2.5 Experiences of eHealth systems usage**
Definition	Please indicate your agreement/disagreement with the following statements (Strongly agree, agree, don't know, disagree, strongly disagree) • I have found useful medical/health information on the Internet • I have found useful medical/health information in my primary language • I have found the medical/health information I was looking for • Doctors in my country are actively using the Internet • Nurses in my country are actively using the Internet • The quality of medical/health information on the Internet needs to improve • I believe that patient anonymity on the Internet is threatened
Notes	-
Sources	HON (1999).
Countries covered	Not available
Time series available	Not available
eEurope relevance	Examines general public and patient parameters of eHealth usage
Links to other indicators	-

Name of indicator	**2. System usage** **2.2 Types of general public usage of Internet based eHealth systems** **2.2.6 Types of patient usage of eHealth systems**
Definition	Please answer the following questions occasionally, frequently or no. • I use the Web to search for information on drugs • I discuss the drug info I find with my care providers • I buy drugs via an on-line pharmacy
Notes	-
Sources	HON (1999).
Countries covered	Not available
Time series available	Not available
eEurope relevance	Examines general public and patient parameters of eHealth usage
Links to other indicators	-

Name of indicator	**2. System usage** **2.2 Patients usage of Internet based eHealth systems** **2.2.7 Patients usage of information obtained on eHealth systems**
Definition	• I have discussed the results of my Internet searches for medical/health information with my care providers • I have used on-line medical consultation services • I engage in e-mail correspondence with my own health care providers • I use the Internet to seek second opinions on medical diagnoses
Notes	-
Sources	HON (1999).
Countries covered	Not available
Time series available	Not available
eEurope relevance	Examines general public and patient parameters of eHealth usage
Links to other indicators	-

Name of indicator	**2. System usage** **2.2 Sources of healthcare information** **2.2.8 General public sources of healthcare information**
Definition	I seek health care information mainly via • Websites • Discussion lists • Newsgroups • e-mail • Newsletters • Other
Notes	-
Sources	HON (1999).
Countries covered	Not available
Time series available	Not available
eEurope relevance	Examines general public and patient parameters of eHealth usage
Links to other indicators	-

Name of indicator	**2. System usage** **2.2 Types of health information sought** **2.2.9 General public types of health information sought**
Definition	Mostly I search for • Descriptions of diseases • Clinical trials • Medical literature (journal articles etc.) • Support groups • Other
Notes	-
Sources	HON (1999).
Countries covered	Not available
Time series available	Not available
eEurope relevance	Examines general public and patient parameters of eHealth usage
Links to other indicators	-

Name of indicator	**2. System usage** **2.2 Preferences for sponsored web sites** **2.2.10 General public preferences for sponsorship of eHealth sites**
Definition	I tend to prefer Web sites run by • Non profit organisations • Patient advocacy or support groups • Hospitals • Commercial companies • Pharmaceutical companies • Other
Notes	-
Sources	HON (1999).
Countries covered	Not available
Time series available	Not available
eEurope relevance	Examines general public and patient parameters of eHealth usage
Links to other indicators	-

Name of indicator	**2. System usage** **2.2 People for whom health information is sought** **2.2.11 General public: target person for health information sought**
Definition	In the last six months I have sought health care information for • My patients • My condition • My general knowledge • My spouse • My children • My parents • My relatives • My friends • Other
Notes	-
Sources	HON (1999).
Countries covered	Not available
Time series available	Not available
eEurope relevance	Examines general public and patient parameters of eHealth usage
Links to other indicators	-

2.3 Practitioners usage of eHealth systems

Name of indicator	**2.3 Practitioners usage** **2.3.1 Sources of medical information**
Definition	I am going to name several sources of medical information and knowledge. Could you tell me if, yes or no, you are using these sources in your profession ? • Seminars and conferences • Interaction with other colleagues • Books • Subscriptions to medical magazines/journals • Attending specialised courses after completion of university studies • Presentations given by pharmaceutical firms salesmen • Printed publicity received directly from pharmaceutical firms • Specialised TV programmes • CD-ROM based information • Internet based information • Other
Notes	-
Sources	Eurobarometer (2000). EU General Practitioners and their ICT usage.
Countries covered	EU 15
Time series available	No
eEurope relevance	Some relations to eHealth initiative
Links to other indicators	-

Name of indicator	**2.3 Practitioners usage** **2.3.2 Frequency of usage of sources of medical information**
Definition	Could you tell me which of those sources you use the most ? • Seminars and conferences • Interaction with other colleagues • Books • Subscriptions to medical magazines/journals • Attending specialised courses after completion of university studies • Presentations given by pharmaceutical firms salesmen • Printed publicity received directly from pharmaceutical firms • Specialised TV programmes • CD-ROM based information • Internet based information • Other
Notes	-
Sources	Eurobarometer (2000). EU General Practitioners and their ICT usage.
Countries covered	EU 15
Time series available	No
eEurope relevance	Some relations to eHealth initiative
Links to other indicators	-

Name of indicator	**2.3 Practitioners usage** **2.3.3 Type of ICT usage**
Definition	I am going to name several technologies which can be used by a general practitioner. Could you tell me if, yes or no, you use those in your work ? • Personal computer • Mobile phone • Portable computer • CD-ROM drive • Fax linked to a computer • Scanner • Electronic agenda • Internet • Accounting software • Special medical software related to your area of expertise • Smart card system • devices which provide a direct interface between your PC and a measurement/analysis instrument • Other
Notes	
Sources	Eurobarometer (2000). EU General Practitioners and their ICT usage.
Countries covered	EU 15
Time series available	No
eEurope relevance	Some relations to eHealth initiative
Links to other indicators	

Name of indicator	2.3 Practitioners usage 2.3.4 Usage of the Internet
Definition	You just told me that you use the Internet in your professional activity. Could you tell me if, yes or no, you use the Internet for …. • Consulting professional databases such as Medline • Consulting sites created by professional associations which give 'doctor-to-doctor' information • Consulting official guidelines prepared by State or local health departments • Consulting sites which present alternative treatments such as homeopathy, phytotherapy, Chinese medicine, or the medicine commonly called 'holistic' etc. • Searching for new drugs on the Web • Exchanging views via e-mail on specific cases with colleagues who have a specific expertise • Interacting with patients via e-mail • Searching for specific information concerning contra-indications of certain drugs • Searching information on clinical cases in order to reinforce your diagnosis • Receiving results of medical analyses from a laboratory • Transferring administrative data to an insurance organisation in the context of reimbursement • Transferring patient clinical information to a specialist or a hospital
Notes	-
Sources	Eurobarometer (2000). EU General Practitioners and their ICT usage.
Countries covered	EU 15
Time series available	No
eEurope relevance	Some relations to eHealth initiative
Links to other indicators	-

Name of indicator	2.3 Practitioners usage 2.3.5 Preferred Internet applications
Definition	In your profession, could you tell me in word, what you would like to do via the Internet that is not yet possible today ?
Notes	-
Sources	Eurobarometer (2000). EU General Practitioners and their ICT usage.
Countries covered	EU 15
Time series available	No
eEurope relevance	Some relations to eHealth initiative
Links to other indicators	-

Name of indicator	**2.3 Practitioners usage** **2.3.6 Adequacy of time available for Internet usage**
Definition	How would you qualify the time you can spare for the updating of your knowledge in your professional activity ? • Sufficient • Rather sufficient • Rather insufficient • Insufficient
Notes	-
Sources	Eurobarometer (2000). EU General Practitioners and their ICT usage.
Countries covered	EU 15
Time series available	No
eEurope relevance	Some relations to eHealth initiative
Links to other indicators	2.3.7, 2.3.8

Name of indicator	**Practitioners usage** **2.3.7 Level of access to ICT applications**
Definition	What percentage of practitioners have access to: • ISDN • Leased lines • Virtual private networks • Internet • E-mail • Professionals only internet service • Self-marketing on the WWW
Notes	Taken from face to face interview protocol
Sources	SATS study
Countries covered	EU-15
Time series available	No
eEurope relevance	Practitioner usage perspective on e-health systems
Links to other indicators	2.3.5, 2.3.8

Name of indicator	2.3 Practitioners usage 2.3.8 Types of ICT applications used in the health care sector

Definition	What are the most important ICT applications used by practitioners in the health care sector ?
	• On-line transfer/communication of administrative and/or medical/laboratory information data
	• Provision of health information/general services for patients/citizens
	• Medical applications:
	  • Interaction with other hospitals/specialists
	  • teleconsultation by store and forward, i.e.
	  • low data volumes
	  • large data columes
	  • real time tele-consultation
	  • Information databases and other sources of on-line advice
	  • Interaction with patients and carers/students
	  • telemonitoring
	  • real time medical teleconsultations
	  • tele-education

Notes	Taken from face to face interview protocol
Sources	SATS study
Countries covered	EU-15
Time series available	No
eEurope relevance	Practitioner usage perspective on e-health systems
Links to other indicators	2.3.5, 2.3.7

Name of indicator	Practitioners usage 2.3.8 Involvement in telemedicine
Definition	Is your organisation involved in telemedicine ? • Yes very heavily involved • Yes, somewhat involved • No, but we are considering it • No, and no plans to do so
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	Practitioners usage 2.3.9 Length of Involvement in telemedicine
Definition	How long has your organisation's telemedicine programme been in existence ? • Less than 1 year • 1 to 2 years or longer • 2 to 4 years or longer • 5 years or longer
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	Practitioners usage 2.3.10 Current usage of telemedicine
Definition	In what ways is your organisation currently using telemedicine ? • For continuing medical education • Clinical consultations (links to homes, long-term care facilities, clinics etc.) • Administration (links to vendors, insurance companies etc.) • For community outreach (public health/wellness information) • Other
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	Practitioners usage 2.3.11 Current usage of telemedicine
Definition	Does your telemedicine programme employ full time staff ? • No • Yes
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	**Practitioners usage** **2.3.12 Medical specialties supported by telemedicine**
Definition	In which of the following departments/areas does your organisation currently use telemedicine technologies ? • Radiology • Administration/finance • Cardiology • Surgery/surgical subspecialties • Pathology • Trauma medicine • Paediatrics • Orthopaedics • Pharmacology • Neurology • Obstretics • Dermatology • Gynaecology • Ophthalmology • Nephrology • Psychiatry • Public health • Dentistry • Rheumatology • Toxicology • Other
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	Practitioners usage 2.3.13 Types of telecommunications technology application
Definition	How frequently are the following advanced communications technologies used to transmit medical information between your organisation and another location or facility ? (Never, Occasionally, Frequently) • Mobile telephone • E-mail • Fax • Institutional computer network • Institutional Intranet • Pagers • Radio • Television • Two way (interactive) video • World Wide Web
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	Practitioners usage 2.3.14 Types of medical information transmitted
Definition	How frequently are the following types of medical information transmitted electronically between your organisation and another location or facility ? • Charts and graphics • Databases • Real-time motion video (e.g. surgical procedures) • Still images (e.g. photos, radiology etc.) • Taped video • Text documents and messages
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	**Practitioners usage** **2.3.15 Reasons for undertaking telemedicine**
Definition	Which of the following was the most important reason for organisation decided to implement a telemedicine programme ? • Deliver quality care to rural/under-served areas • Increasing demand for access to medical inmformation • Enhance continuing medical education • Need to reduce costs and increase efficiency • Improve continuity of health care • Improve patient access to health care • Availability of affordable technology • Increasing need for consultations with specialists • Reduce professional isolation • Rapid response to emergency situations • Increasing demand for home health care • Need to generate additional revenues • Decrease unnecessary referrals
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	**Practitioners usage** **2.3.16 Utility of telemedicine for specific health/medical areas**
Definition	In which areas has telemedicine proved most useful for your organisation ? • Clinical consultation and diagnosis • Staff development and education • Administration and management • Public health and patients support • Other
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	**Practitioners usage** **2.3.17 Usage of telemedicine for administrative applications**
Definition	Is telemedicine technology (radio, video, computer - NOT including standard telephone service) used by your organisation to support any of the following administrative functions ? • Access to medical records • Clinical data repository • Billing and reimbursement • Executive communications • Quality assurance • Case management • Transfer of patient records • Provide clinical practice guidelines to care givers • Electronic commerce with vendors • Comparative outcomes data • Benefits management • Pharmacy/drug disbursemnent • Claims management • Utilisation management • Member services • Contract managment • Other • Don't know
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	**Practitioners usage** **2.3.18 Usage of telemedicine for clinical applications**
Definition	Which clinical medicine application do you consider most valuable ? • Access to medical databases • Remote diagnosis and conultation • Transfer of medical images to be interpreted by specialists at other locations • Remote monitoring of vital signs • Other
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	**Practitioners usage** **2.3.19 Usage of electronic medical information**
Definition	Which of the following types of electronic medical information do you access most frequently ? • Literature databases • General medical resources on the WWW • Online professional journals • Pharmaceutical databases • Image databases • Online 'grand rounds' and case presentations • Toxicity and poison databases • Other • None
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	**Practitioners usage** **2.3.20 Usage of telemedicine for remote patient assessment**
Definition	Does your organisation ever use an interactive telemedicine technology (radio, video, computer - NOT including standard telephone service) to assess a patient at a remote location ? • Never • Occasionally • Frequently • Don't know
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	**Practitioners usage** **2.3.21 Usage of telemedicine for consultation with care giver**
Definition	Does your organisation ever use an interactive telemedicine technology (radio, video, computer - NOT including standard telephone service) to consult a caregiver at a remote location ? • Never • Occasionally • Frequently • Don't know
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	Practitioners usage 2.3.22 Usage of telemedicine for remote observation of procedures
Definition	Does your organisation ever use an interactive, real-time motion video system to enable staff to observe a medical procedure conducted at a remote facility ? • Never • Occasionally • Frequently • Don't know
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	Practitioners usage 2.3.24 Usage of telemedicine for patient monitoring
Definition	Does your organisation ever monitor patient vital signs from remote sites ? • Never • Occasionally • Frequently • Don't know
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	**Practitioners usage** **2.3.25 Usage of telemedicine for image transmission**
Definition	Does your organisation ever electronically transmit medical images (X-ray, CT ECG etc.) for interpretation by a specialist at a remote location ? • Never • Occasionally • Frequently • Don't know
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	**Practitioners usage** **2.3.26 Concerns about telemedicine usage**
Definition	What is your greatest concern related the use of telemedicine for clinical applications ? • Patient confidentiality • Cost of equipment • Equipment interoperability problems • Lack of established protocols/practice standards • Image quality • Lack of clear cost-benefit evidence • Reimbursement of services • Complexity of the technology • Physician acceptance • Malpractice exposure • Licensure issues • Regulatory compliance • Patient acceptance • Other
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	**Practitioners usage** **2.3.27 Organisational web sites for health information dissemination**
Definition	Does your organisation maintain a web site to disseminate health care information to patients and the general public ? • Yes • No • Don't know
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	**Practitioners usage** **2.3.28 Usage of e-mail for clinical instructions**
Definition	Does your organisation ever transmit physician instructions to patients via e-mail ? • Yes • No • Don't know
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	**Practitioners usage** **2.3.29 Usage of interactive video/TV for medical education**
Definition	Have you ever participated in an educational or training event over an interactive video/television system ? • Yes • No
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	**Practitioners usage** **2.3.30 Usage of WWW for medical education**
Definition	Have you ever participated in an educational or training event conducted via the WWW ? • Yes • No
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	**Practitioners usage** **2.3.31 Beliefs about utility of telemedicine in health care**
Definition	In which area do you believe telemedicine will prove most valuable in improving the delivery and quality of health care ? • Rural health care • Primary health care • Home health care • managed care systems • Public health • Ambulance services • Prison health care • Disaster response • Military health care • Airline applications • Maritime applications • Other
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-

Name of indicator	**Practitioners usage** **2.3.32 Organisational problems in telemedicine growth**
Definition	Which of the following common problems is the greatest impediment to the growth of telemedicine at your organisation ? • Lack of funding • Lack of a strategic plan • Access to high speed communications network • Privacy/security issues • Physician acceptance • Pace of technological change • Recruiting competent technical staff • Lack of data interchange standards • Vendors who don't understand clinical needs • Patient acceptance • Other
Notes	-
Sources	BioInformatics Inc (1998).
Countries covered	US and Europe
Time series available	No
eEurope relevance	Practitioners specialist usage
Links to other indicators	-