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DRAFT OECD GUIDE TO MEASURING ICTs IN THE HEALTH SECTOR

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FOREWORD

This OECD Guide to Measuring ICTs in the Health Sector has been developed with the aim to provide a standard reference for statisticians, analysts and policy makers in the field of health Information and Communication Technologies (ICT). The objective is to facilitate cross-country data collection, comparisons and learning on the availability and use of health ICTs.

An OECD Expert Group representing 30 countries (including India, Brazil, and Egypt, as well as the European Commission (EC), the World Health Organisation (WHO) and BIAC (Business and Industry Advisory Committee) and four expert sub-groups or Task Forces, chaired respectively by J. Zelmer (Canada), P. Hämäläinen (Finland), M. Sprenger (the Netherlands), J. Thorpe (United Kingdom) brought a range of relevant expertise and country representation to this initiative. Within the OECD Secretariat, this project was developed by Elettra Ronchi who acted as project manager and coordinator. The project was carried out in close cooperation with Dr Ashish Jha (Harvard University School of Public Health), who led this effort as Chair of the virtual OECD Expert Group on benchmarking health information and technologies, and Julia Adler-Milstein (University of Michigan).

This multi-stakeholder project was first launched in 2008. It was co-financed with grants by Health Canada, the Commonwealth Fund (CMW), the European Commission (Directorate General for Health and Consumers and Directorate General Connect), the Ministry of Health of Spain, the German Federal Health Ministry, and the Office of the National Coordinator for Health Information Technology (ONC) at the US Department of Health and Human Services. Three international workshops were held to advance this work, the first in Barcelona in 2010 co-sponsored by the EC and the Ministry of Health of Spain, the second in Paris in 2011 co-sponsored by the ONC and the CMW Fund, and the third in Brussels co-sponsored by the EC DG Connect.

The Model Survey and the Methodological Guidelines included in this document have been pilot-tested by the European Commission[1] and the Brazil Center for Studies on ICTs (CETIC) in 2013[2]. They will be tested in 2014-2015 by an additional nine pilot countries (Canada, Denmark Finland, Germany, Israel, The Netherlands, South Korea, Switzerland, and The United States). The ICT working group of the Statistical Conference of the Americas of the Economic Commission for Latin America and the Caribbean (ECLAC) adopted in 2014 the OECD Model Survey framework in the development of a regional survey for the measurement of availability and use of ICTs in the health sector and its methodological recommendations.[3]

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[1] Codagnone C., Lupianez-Villanueva F. (2013) Benchmarking Deployment of eHealth among General Practitioners. European Commission DG Communications Networks

[2] http://www.cetic.br/english/

[3] Grupo de Trabajo sobre Medición de las Tecnologías de la Información y las Comunicaciones (2014) Recomendaciones metodológicas para la medición de acceso y uso de las Tecnologías de la Información y las Comunicaciones (TIC) en el sector Salud Grupo. Conferencia Estadística de las Américas (CEA) de la Comisión Económica para América Latina y el Caribe (CEPAL)

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DRAFT OECD GUIDE TO MEASURING ICTS IN THE HEALTH SECTOR

WHY HAS THE GUIDE BEEN PRODUCED?

There is substantial interest across countries in fostering the availability and effective use of ICTs to improve the functioning of their healthcare systems as well as the health of their population. In 2010, an OECD survey of countries identified four core objectives for ICT implementation: (1) Increase the quality and efficiency of care; (2) Reduce the operating costs of clinical services; (3) Reduce the administrative costs of running the healthcare system; and (4) Enable entirely new models of healthcare delivery. (OECD, 2010)

A wide range of ICT systems play a role in addressing these objectives. Moving from paper to electronic health records can, for example, improve the quality of care and make it more efficient by enabling timely access to and better transmission of patient medical information across the healthcare continuum. The effective use of electronic records can also facilitate clinical research, effective public health planning, and the evaluation of healthcare interventions and their quality at the practice level. There is a large body of literature on the experiences of specific organisations and providers in implementing electronic health records (EHR) and other related applications such as e-prescribing and computerized physician order entry (CPOE) systems (Chaudry et al., 2006; Glodzweig et al. , 2009; Numtim et al., 2011; Garg et al., 2005). Taken together, these studies demonstrate that, under the right conditions, health ICTs can drive improvements in quality and efficiency. ICTs can also enable entirely new ways of delivering care. For example, advancements in telecommunications have led to the emergence of tele-ICUs in which specialists can remotely monitor and direct care for the sickest patients who might otherwise lack access to such advanced care (Lilly et al., 2010).

Governments have recognized the large-scale changes that are made possible by health ICTs and in response they are developing approaches to leverage these technologies to pursue a range of health system reforms, such as primary care renewal and pay for performance. The first step towards realizing the array of potential benefits from health ICTs is for governments to develop an e-health strategy. E-health strategies define and prioritize the approach to ICT adoption by describing underlying policies' intended impact on ICT adoption and the resulting goals from adoption. In 2008 a review of 27 European Union (EU) countries found that the majority of governments had formulated specific strategies about their intentions and priorities for e-health. The most commonly stated policy targets were efficiency, improving or reforming the health care system, improving quality of care, and promoting patient-centred services (Hamalainen et al., 2008).

As countries develop and implement their e-health strategies, they will need to monitor progress to ensure their efforts are effective. In 2007, the OECD undertook a study to identify: (1) information needs and the policy objectives that underlie national benchmarking activities; and (2) areas for international action and future research efforts. The study concluded that available national and international data on

health ICTs are rarely comparable, due to inconsistent definitions (e.g., what constitutes an EHR differs across countries) as well as statistical reasons (e.g., different sampling techniques). As a result, it is difficult to draw conclusions on ICT adoption, use, or impact on care within and across countries. It is similarly challenging for countries to evaluate the outcomes of their policies and identify practices from which they could learn.

The aim of the model survey is, therefore, to assist governments in understanding the barriers and incentives to ICT use and realize the far-reaching economic and social benefits from their application.

Who is the intended audience for the Guide?

The guide is written for countries that seek to produce national measures of the availability and use of health ICTs that can be compared to those of other countries. The guide is specifically targeted to those who will be implementing the data collection efforts and calculating benchmark measures.

What does the Guide contain?

There are two primary components of the guide. The first is the model survey. It is composed of self-contained modules that ensure flexibility and adaptability to a rapidly changing environment. The use of core modules (as an add-on to existing national surveys or as a stand-alone survey) allows measurement on an internationally comparable basis. Additional modules and new measures can be added to respond to evolving or country-specific policy needs in this area. Each module contains sample questions and there is an accompanying glossary with explanations of key terms.

The second component of the guide is a methodological guide to aid implementation and promote validity and comparability of resulting benchmark measures. The guide describes the types of meta-data, such as response rates and sampling approaches, which countries will be asked to report in order to help assess the validity of their data. To promote comparability, the guide leverages international classifications of health care delivery settings (e.g., hospitals) as well as health care professionals (e.g., general practitioners) to ensure consistent interpretations of the target populations and respondents.

FRAMEWORK ADOPTED

The development of benchmark measures in health ICT has been guided by three overarching principles. First, measures needed to respond to policy and information needs of countries along a continuum, starting from ICT availability, moving towards effective use, and ending with measuring outcomes and impact on population health. A continuum-based approach has the advantage of accommodating countries that are at different levels of maturity and progress towards achieving their e-health goals. For example, advanced countries are unlikely to devote substantial resources to collecting data on availability of ICTs if their policy needs are focused on effective use and better outcomes. Having a continuum approach allows these countries to participate in the broader process.

The second principle was to use the OECD "model survey" framework, which takes a staged approach in moving international measurement work forward (OECD, 2011). To be broadly useful, the OECD model survey is composed of separate, self-contained modules that ensure flexibility and adaptability to a rapidly changing environment. Core modules can be added-on to existing national surveys or administered as a stand-alone survey while supplemental modules can be used as needed by countries. The approach allows broad measurement of core concepts on an internationally comparable basis while allowing countries to tailor some of the content they collect to address country-specific needs. For example, while the current measures focus on availability and use, in time, countries will also want to integrate measures on outcomes.

The third principle was to use a functionality-based approach to defining key types of health ICTs. One of the key challenges to a model survey is to ensure that the terminology has comparable meaning across different countries – and that when changes to the questions are made by individual countries, they are done in ways that maintain this comparability. For example, while many OECD countries use the terms electronic medical record (EMR) and electronic health record (EHR) interchangeably, in Canada, electronic medical records refer to systems used by a healthcare professional to manage patient health information in a specific medical setting. The EHR is a distinct concept that involves pooling data from multiple different clinical settings, allowing access to a more comprehensive patient record. If a core module question asked physicians about EHR use, the answers from Canada and the U.S. would, for example, mean very different things. These differences in interpretation and approach across countries would impede meaningful benchmarking.

To avoid such issues, the choice has been to focus on developing indicators using a functionality-based approach, i.e. on achieving consensus across countries on the core types of clinical and other activities that are supported by electronic systems This approach also supports technology-neutrality (i.e., the questions neither require nor assume a particular technology) and is forward looking (i.e., does not hinder the use or development of technologies in the future).

Areas covered

The model survey addresses four categories of broadly defined domains in which ICTs support care delivery:

Provider-centric Electronic Records

Often referred to as Electronic Medical Records (EMRs), Electronic Health Records (EHRs), or Electronic Patient Records (EPRs), provider-centric electronic records include systems that are used by healthcare professionals to store and manage patient health information and data, and include functionalities that directly support the care delivery process.

Patient-centric Electronic Records

Often referred to as Personal Health Records (PHRs), Patient Portals, and other Patient-centric Electronic Records, these systems are typically used by patients and their families to access and manage their health information and organize their health care.

Health Information Exchange

Health Information Exchange (HIE) refers to the process of electronically transferring, or aggregating and enabling access to, patient health information and data across provider organisations. Exchange may take place between different types of entities – for example, e-transfer of patient data between ambulatory care providers or e-transfer of data at the regional level.

Telehealth

Telehealth encompasses a broad set of technologies that support care between patients and providers, or among providers, who are not co-located. Telemedicine is often defined as synchronous video-mediated consultations between physicians and patients. However, it may also include applications such as remote home monitoring of patients, tele-ICUs, and teleradiology.

To decide which functionalities to include in each domain of the initial set of benchmark measures, a group of seven OECD countries were selected to serve as case studies: Australia, Canada, Denmark, England, Finland, the Netherlands, and the United States. The study purposefully focused on countries with more mature e-health strategies in order to ensure sufficient health ICT measurement activity to review (Adler-Milstein et al, 2013). However, in order to ensure that the initial focus on these advanced high-income nations did not result in measures that would not generalize, the OECD engaged a broader set of countries in the refinement and finalization of the measures, including non-OECD countries such as Argentina, Brazil, Egypt and South Africa.

Four task forces, one for each domain and with representation from at least 7 countries, worked to develop and refine a set of functionality-based indicators and associated sample questions that comprise the model survey modules. Countries that are represented on the taskforces include Argentina, Australia, Belgium, Brazil, Canada, the Czech Republic, Denmark, Finland, France, Israel, Italy, Japan, the Netherlands, Norway, Poland, South Korea, Spain, Sweden, Switzerland, the United Kingdom and the United States. As a final step, the questions were presented to OECD and European Union countries at a meeting organised jointly with the European Commission in April 2013. Based on feedback from that consultation, the functionality-based indicators and associated sample questions were finalized. The areas covered are summarized in the table below.

Table 1. Categories of broadly defined ICT domains

Provider-centric electronic record	Patient-centric electronic record	Health Information Exchange	Tele-health
1. Entry of core patient data (e.g., medication allergies, clinical problem list) 2. Decision support (e.g., drug-drug alerts) 3. Closed-loop medication administration 4. Clinical documentation	1. Viewing of clinical data (e.g., test results) 2. Supplementation of clinical data (e.g., entering or modifying current medications) 3. Appointment scheduling 4. Medication renewal	1. Secure messaging between professionals 2. Ordering and reporting of medications and lab tests with result receipt 3. Patient referrals	1. Tele-home care/tele-monitoring 2. Remote consultation 3. Asynchronous communication

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STRUCTURE OF THE MODEL SURVEY

Scope of the Survey

The survey aims to gather information on systems that are used by healthcare professionals to store and manage patient health information and data, and include functionalities that directly support the care delivery process. In addition to the systems themselves, the survey gathers information on the electronic transfer of patient health information and data across provider organisations.

As technology and policy priorities evolve, the model survey will need to be reviewed and adapted over time. The model survey includes terminology for which there is to date no shared understanding or single definition. A list of terms for which Task Force members or individual participant countries have requested that a definition or description be provided is included in the Glossary appended under Annex I. In some cases, countries may choose to use a country-specific definition or provide further specificity based on policy needs.

Structure of the model survey

The model questionnaire is structured as shown in Table 2. Part I of the survey is addressed to general/primary care/family practitioners in ambulatory settings, Part II, to Chief Information Officers and administrators in the acute care settings. The organisation of health systems across OECD countries varies significantly. Guidance on definitions and possible International classifications to facilitate the compilation of internationally comparable statistical indicators are addressed in a separate methodology guide.

Table 2. Structure of the Model Survey

PART I	GENERAL PRACTITIONERS/PRIMARY CARE PHYSICIANS
Section A	Contextual Indicators (i.e., basic demographic data about respondents and their practice setting)
Section B	Availability and use of electronic records and health information exchange
Section C	Availability and use of functionalities that support patient engagement
Section D	Availability and use of telecommunications technologies to support health care delivery
PART II	CHIEF INFORMATION OFFICERS/IT ADMINISTRATORS
Section A	Contextual indicators (i.e., basic demographic data about respondents and their organisation)
Section B	Availability and use of electronic records and health information exchange
Section C	Availability and use of functionalities that support patient engagement
Section D	Availability and use of telecommunications technologies to support health care delivery

Section A: Contextual Indicators

Section A includes questions that might be needed for meaningful interpretation of the data collected and international health ICT comparisons. This concept was supported by the Task Force experts who recommended that the final model survey and methodology guide could reference a number of indicators that have been previously published to take advantage of established definitions and indicator constructs, as well as data collection processes. The methodology guide includes a list of such possible sources.

Section B: Availability and use of Electronic Records and Health Information Exchange

Section B of the survey covers seven domains in which electronic records and health information exchange support health professionals in delivering care: (1) Entry of core patient data; (2) Decision support; (3) Closed-loop medication administration; (4) Clinical documentation; (5) Secure messaging between professionals; (6) Ordering and reporting of medications and lab tests with result receipt; and (7) Patient referrals. These domains serve as the basis for the questions, many of which include multiple specific functionalities or types. For example, entry of core patient data includes eleven distinct types of data.

It is recognized that countries have fundamentally different approaches to how patient health information is stored and shared. There are national or regional/provincial shared electronic systems as well as stand-alone systems. This in turn shapes the extent to which functions are internal to the electronic system or involve exchange outside the organisation. Countries may therefore need to modify questions to fit their specific approach. Specifically, depending on the extent of integration of Health Information Technologies (HIT), electronic communication of patient data may be called "exchange" in some countries and "sharing" in others.

Related to this, it is recognized that there are multiple reasons for transmitting information. The survey includes a limited subset of possible objectives. Countries who are interested in a broader list should feel free to expand the survey accordingly.

Section C: Availability and use of functionalities that support patient engagement with electronic records

Many countries have identified patient involvement in their health and wellbeing as a strategic priority. For the purposes of this survey, questions in Section C focus on functionalities that are typically used by patients and their families to access and manage their health information and organize their health care.

There are markedly different approaches to, and functionalities supporting, patient engagement with electronic records (e.g. access organised through primary care or through hospitals) and some areas were not considered mature enough. Hence, the indicators included in the survey currently focus on: (1) Viewing of clinical data; (2) Supplementation of clinical data; (3) Appointment scheduling; (4) Medication renewal; and (5) Secure messaging between patients and health professionals.

Section D: Availability and use of telecommunications technologies to support health care delivery

For the purposes of this work, the development of Section D (the availability and use of telecommunications technologies to support health care delivery) , was informed by a definition of telemedicine developed by the International Organisation for Standardization (use of advanced telecommunication technologies to exchange health information and provide health care services across geographic, time, social and cultural barriers), with the understanding that the scope would include the activities of a range of health professionals, not just physicians.

This section focuses on three areas of clinical practice where telehealth technologies are used to deliver patient care: (1) synchronous (video) consultation, (see Glossary) (2) asynchronous (store and forward) consultation, (3) remote (patient) monitoring sometimes known as telehomecare. A fourth area of interest focuses on contextual indicators (e.g. technological infrastructure and specific policies to incentivise and regulate the use of telehealth technologies) that could serve to describe the current state of each country where the extent of such enablers may affect the implementation and adoption of telehealth technologies.

**OECD MODEL SURVEY
PART I
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTS) BY HEALTH
CARE PROFESSIONALS AND PROVIDERS**

Draft Cover note

Thank you for your interest in participating in this survey. The objective of this study is to measure the use of Information and Communication Technologies (ICT) among physicians who provide primary care (typically known as General Practitioners or Primary Care Physicians) in OECD countries by means of this questionnaire. We estimate that it will take approximately 30 minutes to complete. Your feedback will help policy-making initiatives on this important matter.

There are four sections that comprise the survey. Part A seeks information about Contextual Indicators (i.e., basic demographic data about you and your practice setting). Part B asks about availability and use of electronic records and health information exchange. Part C asks about availability and use of functionalities that support patient engagement. Part D asks about availability and use of telecommunications technologies to support health care delivery.

Please answer all questions as they pertain to your ***primary place of work over the past three months***.

1.   Consult the glossary (Annex I) for an explanation of the terms used in this questionnaire.

SECTION A:

1. **Which of the following categories best describes your primary professional activity? [SINGLE ANSWER]**

a) Ambulatory patient care: primary care
b) Ambulatory patient care: specialty care
c) Non-ambulatory patient care
d) Research
e) Teaching
f) Administration
g) Other _____

2. **Your primary work place is located in a...? [SINGLE ANSWER]**

a) large city (more than 100,000 inhabitants)
b) mid-small city (between 20,000 to 100,000 inhabitants)
c) rural town (less than 20,000 inhabitants)

3. **Your primary work place is best characterized as a...? [SINGLE ANSWER]**

a) Private practice
b) Public practice
c) Other _____

4. **Approximately (estimate if you do not know exactly) how many full-time physicians work at your primary work place, including yourself?**

a) Number of general practitioners/primary care physicians including yourself (full-time equivalent): ____

b) Number of other physicians (full-time equivalent): ____

SECTION B:

1. **Is there an electronic system in your primary practice setting that you use to store and manage patient health information?**
   - ☐ Yes
   - ☐ Partially, some information is stored/managed electronically and some is stored/managed on paper
   - ☐ No
   - ☐ Don't know[4]

2. **Please indicate whether the following types of clinical data for your individual patients are available to you electronically in your primary practice setting.**
   Please distinguish data that are generated from within your organisation from those that are generated from outside your organisation. If available, please indicate how often you use the data when treating your patients:

	When it is generated from **within your organisation**	When it is generated from **outside your organisation**
a. Patient demographics (e.g., age, gender)	Answer choices:	Answer choices:
b. Detailed clinical notes from encounter with clinician/medical history/anamnesis	*Available, used routinely*[5]	*Available, used routinely*
c. Problem list	*Available, used occasionally*	*Available, used occasionally*
d. Diagnoses		
e. Active/current medication list	*Available, but not used*	*Available, but not used*
f. Vital signs		
g. Allergies	*Not Available*	*Not Available*
h. Immunisations	*Don't know*	*Don't know*

3. **Does the electronic system that you use in your primary practice setting allow you to prescribe medications?**
   - ☐ Yes, used routinely
   - ☐ Yes, used occasionally
   - ☐ Yes, but not used
   - ☐ No
   - ☐ Don't know

   a. **If yes, does the system make the prescription electronically available to pharmacies outside of your organisation?**

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[4] It was suggested that a stop logic be added if respondents indicate "No" or "Don't Know". We suggest allowing respondents to continue in case they may be able to answer questions about specific types of data and functionalities that are available electronically.

[5] It was suggested that frequency may vary based on patient health status and medical specialty. The intent is to capture the average experience for the given respondent.

☐ Yes, any pharmacy outside of my organisation
☐ Yes, some pharmacies outside of my organisation
☐ Yes, but not used
☐ No
☐ Don't know

b. **If yes, does the system allow you to access information on dispensing status by the pharmacist in the pharmacy outside of your organisation:**
☐ Yes, for most or all of my patients
☐ Yes, for a few of my patients
☐ Yes, but not used
☐ No
☐ Don't Know

4. **Does the electronic system that you use in your primary practice setting allow you to perform the following functions electronically when needed?**

	Yes	No	Don't Know
Routine Clinical Functions			
a. List patients who are due for tests	☐	☐	☐
b. List medications ordered from outside of your organisation	☐	☐	☐
c. List of medications dispensed outside of your organisation	☐	☐	☐
General Health Management			
a. List patients by diagnosis	☐	☐	☐
b. List of patients by lab result	☐	☐	☐
c. List of all patients within your organisationorganisation who have been prescribed a particular medication	☐	☐	☐

5. **Does the electronic system that you use in your primary practice setting include:**

	Yes	No	Don't Know
a. Access to clinical guidelines, protocols, and/or best practices	☐	☐	☐
b. Structured order sets	☐	☐	☐
c. Drug-drug interaction or contraindications alerts/reminders	☐	☐	☐
d. Drug-allergy alerts/reminders	☐	☐	☐

6. **Does the electronic system that you use in your primary practice setting allow you to:**

(Note: Countries have fundamentally different approaches to how patient health information is stored and shared. There are national or regional/provincial shared electronic systems as well as stand-alone systems. This in turn shapes the extent to which functions are internal to the electronic system or involve exchange outside the organisation. Countries may therefore need to modify question (6) to fit their specific approach.)

	Within your organisation	Outside your organisation
a. Send clinical/patient medical information securely to other health professionals	Answer choices: *Available, used routinely*[6]	Answer choices: *Available, used routinely*
b. Receive clinical/patient medical information securely from other health professionals	*Available, used occasionally*	*Available, used occasionally*
c. Send patient summaries	*Available, but not used*	*Available, but not used*
d. Receive patient summaries	*Not Available*	*Not Available*
e. Send electronic referrals	*Don't know*	*Don't know*
f. Receive electronic referral reports		
g. Receive summary of the care received during a hospitalisation upon discharge (e.g., discharge summary)		
h. Send order/request for lab test		
i. Receive lab test results		
j. Receive radiology test results: reports		
k. Receive radiology test results: images		

SECTION C:

1. **Do patients remotely have a view of, or access to, the following information in the electronic system that you use in your primary practice setting, and if available, how often it is used by patients:**

	Patient has view/access	Patient use (frequency)
a) Test results	☐	Answer choices: *Frequently*
b) Medication lists	☐	*Occasionally*
c) Discharge instructions	☐	*Rarely/Never*
d) Summary care notes	☐	*Don't Know*
e) Diagnoses	☐	

2. **Are patients able to make the following supplements to the data included in the electronic system that you use in your primary practice setting, and if available, how often it is used?**

	Patient has ability	Patient use (frequency)
a) Add measurements (e.g., blood pressure readings)	☐	Answer choices: *Frequently* *Occasionally* *Rarely/Never* *Don't Know*
b) Add text and/or other documentation	☐	

3. **Are patients able to book appointments online?**
   ☐ Yes
   ☐ No
   ☐ Don't Know

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[6] It was suggested that frequency may vary based on patient health status and medical specialty. The intent is to capture the average experience for the given respondent.

4. **Are patients able to request prescriptions online?**
☐ Yes
☐ No
☐ Don't Know

If yes, are patients able to do the following tasks online? And if available, how often is it used by patients?

		Patient has ability	Patient use (frequency)
a)	request repeat of current medications	☐	Answer choices:
b)	request new medication	☐	*Frequently*
			Occasionally
			Rarely/Never
			Don't Know

5. **Can patients engage in asynchronous/not-real time secure online/electronic communication with a professional about a clinical issue?**
☐ Yes
☐ No
☐ Don't Know

   a. **If yes, how often do patients use this function?**
   ☐ Frequently
   ☐ Occasionally
   ☐ Rarely
   ☐ Don't Know

SECTION D:

1. **In the past 3 months, have you or other providers delivered primary health care services to patients in real time using telemedicine, e.g. via a video link?**
☐ Yes
☐ No
☐ Don't Know
☐ Not Applicable

2. **In the past 3 months, have you used asynchronous telehealth technologies, where an image and other patient information is recorded and reviewed in a different location? Examples include: teledermatology, telepathology, teleopthamology; however, exclude teleradiology.**
☐ Yes
☐ No
☐ Don't Know
☐ Not Applicable

3. **In the past 3 months, have any patients in your practice been enrolled in remote telemonitoring services (e.g. telehomecare)?**
☐ Yes
☐ No
☐ Don't Know
☐ Not Applicable

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OECD MODEL SURVEY
PART II
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTS) BY CHIEF
INFORMATION OFFICER / INFORMATION TECHNOLOGY ADMINISTRATORS

Draft Cover note

2.   Thank you for your interest in participating in this survey. The objective of this study is to measure the use of Information and Communication Technologies (ICT) among acute-care facilities in OECD countries by means of this questionnaire. We estimate that it will take approximately 30 minutes to complete. Your feedback will help policy-making initiatives on this important matter.

3.   There are four sections that comprise the survey. Part A seeks information about Contextual Indicators (i.e., basic demographic data about you and your organisation). Part B asks about availability and use of electronic records and health information exchange. Part C asks about availability and use of functionalities that support patient engagement.   Part D asks about availability and use of telecommunications technologies to support health care delivery.

4.   Please answer all questions as they pertain to your **organisation over the past three months.** If your organisation includes more than one acute-care facility, please complete a separate response for each. Please consult the glossary (Annex I) for an explanation of the terms used in this questionnaire.

SECTION A:

1.   **Your facility is located in a...?** [SINGLE ANSWER]
   a) large city (more than 100,000 inhabitants)
   b) mid-small city (between 20,000 to 100,000 inhabitants)
   c) rural town (less than 20,000 inhabitants)

2.   **Your facility is best characterized as...?** [SINGLE ANSWER]
   a) Private
   b) Public
   c) Other _____

3.   **Approximately how many total beds are available in your facility?** _____

4.   **Does your facility include trainee physicians (i.e., is it a teaching facility)?**
      a. Yes
      b. No

5.   **Does your facility provide :**

	Yes	No
a. In-Patient Acute care		
b. Other In-patient care		
c. Out-patient care		

SECTION B:

1. **Is there an electronic system in your organisation that is used to store and manage patient health information?**
   ☐ Yes
   ☐ Partially, some information is stored/managed electronically and some is stored/managed on paper
   ☐ No
   ☐ Don't know[7]

2. **Please indicate whether the following types of clinical data for individual patients are available electronically to those treating patients in your organisation.**
   Please distinguish data that are generated from within your organisation and those that are generated from outside your organisation. If available, please indicate how often the data are used when treating patients in your organisation:

		When it is generated from **within your organisation**	When it is generated from **outside your organisation**
d.	Patient demographics (e.g., age, gender)	Answer choices:	Answer choices:
e.	Detailed clinical notes from encounter with clinician/medical history/anamnesis	*Available, used routinely*[8]	*Available, used routinely*
f.	Problem list	*Available, used occasionally*	*Available, used occasionally*
g.	Diagnoses		
h.	Active/current medication list	*Available, but not used*	*Available, but not used*
i.	Vital signs		
j.	Allergies	*Not Available*	*Not Available*
k.	Immunizations	*Don't know*	*Don't know*

3. **Does the electronic system that is used in your organisation allow users to prescribe medications?**
   ☐ Yes, used routinely
   ☐ Yes, used occasionally
   ☐ Yes, but not used
   ☐ No
   ☐ Don't know

   a. **If yes, does the system make the prescription electronically available to pharmacies outside of your organisation?**
      ☐ Yes, any pharmacy outside of the hospital
      ☐ Yes, some pharmacies outside of the hospital
      ☐ Yes, but not used
      ☐ No
      ☐ Don't know

---

[7] It was suggested that a stop logic be added if respondents indicate "No" or "Don't Know". We suggest allowing respondents to continue in case they may be able to answer questions about specific types of data and functionalities that are available electronically.

[8] It was suggested that frequency may vary based on patient health status and medical specialty. The intent is to capture the average experience for the given respondent.

    b.   If yes, does the system allow you to access information on dispensing status by the pharmacist in the pharmacy outside of your organisation

☐ Yes, for most or all patients
☐ Yes, for a few of patients
☐ Yes, but not used
☐ No
☐ Don't Know

4. Does the electronic system in your organisation allow users to perform the following functions electronically when needed?

	Yes	No	Don't Know
Routine Clinical Functions			
a. List patients who are due for tests	☐	☐	☐
b. List medications ordered from outside of your organisation	☐	☐	☐
c. List of medications dispensed outside of your organisation	☐	☐	☐
General Health Management			
a. List patients by diagnosis	☐	☐	☐
b. List of patients by lab result	☐	☐	☐
c. List of all patients within your organisation who have been prescribed a particular medication	☐	☐	☐

5.   Does the electronic system in your organisation include:

	Yes	No	Don't Know
a. Access to clinical guidelines, protocols, and/or best practices	☐	☐	☐
b. Structured order sets	☐	☐	☐
c. Drug-drug interaction or contraindications alerts/reminders	☐	☐	☐
d. Drug-allergy alerts/reminders	☐	☐	☐

6. Does your organisation have an electronic medication administration system that records and verifies appropriate medication administration at the point-of-care (e.g., bar coded, RFID)?

☐ Yes, used routinely
☐ Yes, used occasionally
☐ Yes, but not used
☐ No
☐ Don't know

7.   Does the electronic system in your organisation allow users to:

	Within your organisation	**Outside your organisation**
a. Send clinical/patient medical information securely to other health professionals	Answer choices: *Available, used routinely*[9]	Answer choices: *Available, used routinely*
b. Receive clinical/patient medical information securely from other health professionals	*Available, used occasionally*	*Available, used occasionally*

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[9] It was suggested that frequency may vary based on patient health status and medical specialty. The intent is to capture the average experience for the given respondent.

c. Send patient summaries	*Available, but not*	*Available, but not*
d. Receive patient summaries	*used*	*used*
e. Send electronic referrals	*Not Available*	*Not Available*
f. Receive electronic referral reports	*Don't know*	*Don't know*

g. Send summary of the care received during a hospitalization, upon discharge (e.g. discharge summary)

h. Receive summary of the care received during a hospitalization upon discharge (e.g., discharge summary)

i. Send order/request for lab test

j. Receive lab test results

k. Receive radiology test results: reports

l. Receive radiology test results: images

SECTION C:

1. Do patients remotely have a view of, or access to, the following information in the electronic system that you use in your organisation, and if available, how often it is used by patients:

		Patient has view/access	Patient use (frequency)
a)	Test results	☐	Answer choices:
b)	Medication lists	☐	*Frequently*
c)	Discharge instructions	☐	*Occasionally*
d)	Summary care notes	☐	*Rarely/Never*
e)	Diagnoses	☐	*Don't Know*

2. Are patients able to book appointments online?
☐ Yes
☐ No
☐ Don't Know
☐ Not Applicable

3. Are patients able to book lab tests online?
☐ Yes
☐ No
☐ Don't Know
☐ Not Applicable

4. Are patients able to request prescriptions online?
☐ Yes
☐ No
☐ Don't Know
☐ Not Applicable

If yes, are patients able to do the following tasks online? And if available, how often is it used by patients?

		Patient has ability	Patient use (frequency)
a)	request repeat of current medications	☐	Answer choices:
b)	request new medication	☐	*Frequently*
			Occasionally
			Rarely/Never
			Don't Know

5. Can patients engage in asynchronous/not-real time secure online/electronic communication with professionals in your organisation about a clinical issue?
☐ Yes
☐ No
☐ Don't Know
☐ Not Applicable

   a. If yes, how often do patients use this function?
   ☐ Frequently
   ☐ Occasionally
   ☐ Rarely
   ☐ Don't Know

SECTION D:

1. Are real-time health care services available to patients using telemedicine, e.g. via a video link?
☐ Yes
☐ No
☐ Don't Know
☐ Not Applicable

2. In the past 3 months, have any patients in your organisation been enrolled in remote telemonitoring services (e.g. telehomecare)?
☐ Yes
☐ No
☐ Don't Know
☐ Not Applicable

METHODOLOGICAL GUIDELINES

The aim of this chapter is to guide the methodological decisions of countries as they implement the Model Survey. A first draft of these guidelines was presented at the OECD-EC 2013 workshop. The current version has been revised based on feedback received from experts since and will serve as input for the discussion on the design of pilot studies. The guidelines will be further revised based on the experience and results of pilot countries.

The use of common concepts in the statistics compiled by national agencies and international organisations are prerequisites for international comparisons and benchmarking. In particular, consistency across several dimensions helps to ensure comparability:

      a. Consistency in the type of organisation being surveyed
      b. Consistency in the type of respondents
      c. Consistency in the time period
      d. Consistency in the survey content and structure (order of questions; wording)
      e. Consistency in the mode of survey administration (phone; in person)
      f. Consistency in the reporting and analysis methods

In practice, in an international context, complete consistency across all these dimensions is not feasible as many countries have already established procedures for conducting national surveys. In this case, it becomes essential to reach agreement on a minimum core set of dimensions and general guidance in four key areas:

- Target Population

- Respondents

- Contextual Measures & Definitions

- Characteristics of Data Collection and Analysis

1- Target Population

The current version of the OECD Model Survey is designed to capture data on two types of **organisations**: hospitals and primary care/general practices. The organisation of health systems across OECD countries varies significantly, as do the terms used to describe different settings and clinical contexts.

To facilitate the compilation of internationally comparable statistical measures, a commonly used approach is to rely on an internationally agreed set of classifications, thus ensuring cross-national comparability of resulting indicators. Most countries either adopt these international standards for their own purposes, or base national classifications on them.

In the Health Sector a commonly used classification system is the OECD System of Health Accounts (SHA). The SHA builds on more than fifteen years of work of the OECD on international comparisons

of health care data in support of economic analysis of health policy. It provides a standard framework for producing a set of comprehensive, consistent and internationally comparable accounts to meet the needs of public and private-sector health analysts and policy-makers.

The classification of health care providers (ICHA-HP) developed for the SHA serves the purpose of classifying all organisations that contribute to the provision of health care goods and services, by arranging country-specific provider units into common, internationally applicable categories. The tables in annex II include the relevant classifications.

The principal activity exercised (or health care functions) is used as the basic criterion for classification. This means that when classifying an actor or organisation, the first question should be: does the unit provide health care? If the answer is yes, the next step is the identification of the activities that it performs and the legal requirements for the provision of these activities.

Providers classified under the same category will, however, not always perform exactly the same set of activities in each of the countries surveyed. Hospitals, which are major health care providers, usually offer not only inpatient health care services, but, depending on specific country arrangements, may also provide outpatient care, rehabilitation, long-term care services and so on.

The primary advantage of using the ICHA-HP classification for the purpose of international comparisons is to help ensure a shared understanding of the target population.

International standards can also be helpful in establishing guidelines that facilitate flexibility in reporting. For example, they can be used to determine rules on indicators of the *volume* of services provided, which enable a switch from observation units (e.g. 70% of hospitals) to other measures that are relevant in health care systems (e.g. 70% of hospital beds). The tables in Annex II report examples of some general indicators and current international practice.

Ambulatory practices:

Ambulatory practices comprise establishments that are primarily engaged in providing health care services directly to outpatients who do not require inpatient services.

The Model Survey should be administered to a subset of this category: offices of general medical practitioners. In many countries, this is the level of a health services system that acts as a gatekeeper, and provides entry into the system for all new health needs and problems, provides person-focused (not disease-oriented) care over time, provides care for all but very uncommon or unusual conditions, and coordinates or integrates care, regardless of where the care is delivered and who provides it.

This ad hoc definition excludes medical specialists and establishments specialising in the treatment of day-cases and in the delivery of home care services.

There are five subcategories of providers of ambulatory health care: (1) medical practices, (2) other health care practitioners, (3) ambulatory health care centres, (4) dental practices and (5) providers of home health care services.

Since ambulatory care may be delivered in any of these settings, rather than focus on identifying the target setting and then selecting respondents, it is suggested that countries:

- focus on identifying the appropriate respondents

- ask respondents about their practice setting, excluding responses as needed if settings beyond the five listed above are represented.

Box 1 below provides some examples of how countries have defined the types of professionals who deliver primary care.

Box 1. Defining Primary Care/GPs – Examples of Specific Approaches

Denmark

GPs have been defined by the National Board of Health's Labour Register for Health Personnel based on the following characteristics:
- One year of specialist training in a general practice clinic;
- A patient panel list system

Sweden

GPs have been defined by the National Board of Health and Welfare's National Planning Support (NPS) register based on the following characteristics:
- Specialists in Family Medicine;
- Minimum of five years of specialist training at a specially designed training post

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Hospitals:

According to the ICH-HP, hospitals comprise licensed establishments that are primarily engaged in providing medical, diagnostic and treatment services that include physician, nursing and other health services to inpatients and the specialised accommodation services required by inpatients.

Hospitals provide services to the acutely ill or those who may be recovering from an acute illness. Although the principal activity is the provision of inpatient medical care, hospitals may also provide day care, outpatient and home health care services as secondary activities. Care may also be delivered by specialised facilities and include advanced medical technology and equipment, which form a significant and integral part of the provision process. Hence, the tasks of hospitals may vary substantially both within and across countries. In order to be legally registered as a hospital, in some countries, health care facilities need to have a minimum size (such as a number of beds and medical staff to guarantee 24-hour access).

SHA distinguishes between general hospitals, mental health hospitals and specialised hospitals other than mental health hospitals, depending both on the scope of medical treatments provided and the specificity of diseases or medical conditions of inpatients (table A3 in Annex II).

5.   Part II of the model survey should be administered to the following type(s) of hospitals:

HP.1.1 General hospitals

This category encompasses licensed establishments that are primarily engaged in providing general diagnostic and medical treatment (both surgical and non-surgical) to inpatients with a wide variety of medical conditions. These establishments may provide other services, such as outpatient services, anatomical pathology services, diagnostic X-ray services, clinical laboratory services or operating room

services for a variety of procedures and/or pharmacy services, that are usually used by internal patients (intermediate outputs within the hospital treatment) but also by outside patients.

HP.1.2 Mental health and substance abuse hospitals

This category comprises licensed establishments that are primarily engaged in providing diagnostic and medical treatment and monitoring services to inpatients who suffer from severe mental illness or substance abuse disorders. The treatment often requires an extended stay in an inpatient setting, including intensive pharmaceutical treatment.

Depending on the specificity of the hospital's various therapies, psychiatric, psychological or physical therapies are available at the facilities as well as other types of services including educational and vocational services in order to ensure comprehensive treatment, leading at the end to patient recovery. To fulfil the complexity of these tasks, mental health hospitals usually provide services other than inpatient services, such as outpatient mental health care, clinical laboratory tests, diagnostic X-rays and electroencephalography services, which are often available for both internal and outside inpatients but also for outpatients. Mental health hospitals exclude community-based psychiatric inpatient units of general hospitals.

HP.1.3 Specialised hospitals (other than mental health hospitals)

6. This item comprises licensed establishments that are primarily engaged in providing diagnostic and medical treatment as well as monitoring services to inpatients with a specific type of disease or medical condition.

Box 2. Defining Hospitals – Examples of Specific Approaches

Finland

- Finland does not have an official institution called "a hospital". Instead, they have public health care centres that include both inpatient and ambulatory care at primary, secondary and tertiary levels.

- To collect benchmark data, Finland plans to send the survey to the administrative head of each public health care centre. They will fill in the questionnaire as a team with the CIO included.

European Commission

The European Hospital Survey to benchmark deployment of e-Health services in the EU27 as well as Croatia, Iceland, and Norway established a census of acute hospitals according to the following screening criteria:

- Respondent suggests that the hospital is an acute or general hospital; or

- The hospital has: an emergency department, and either a life-saving surgery operating room or an intensive care unit.

2- Respondents

Once the type of organisation is chosen, it will be important to decide who will actually fill out the surveys (i.e., the respondents). The OECD model survey is designed to be completed by **Chief Information Officers** or the administrator with the best oversight of ICT capabilities in the hospital setting and **primary care/general practitioners (see below for details of how these providers are defined)** in the ambulatory setting.

The international classifications in these fields could be drawn from the International Standard Classification of Occupations (Box 3) - developed by the International labour Organisation (ILO) and the International Standard Industrial Classification. Both of these classification systems have been revised recently.

National associations of hospitals and health professionals may be useful partners that can help to apply these standard classifications and identify sampling frames within countries.

Box 3. Understanding ISCO-08

The International Classification of Occupations (ISCO) is a tool for organizing jobs in a clearly defined set of groups and according to tasks and duties undertaken in the job. Its main aims are to provide:

A basis for the international reporting, comparison and exchange of statistical and administrative data about occupations;

A model for the development of national and regional classifications of occupations; and

A system that can be used directly in countries that have not developed their own national classifications.

The first version of ISCO was published by ILO in 1958 and is known as ISCO-58. It has, since then, been revised thrice to ISCO-68, ISCO-88 and ISCO-08.

ISCO-08 is the latest version; it takes into account developments in the world of work since 1988 and makes improvements in the light of experience gained in using ISCO-88.

ISCO-08 consists of a 4-digit hierarchical coding system comprising major groups broken into sub-major groups then into minor groups and ultimately into unit groups.

Classification level	Code	Example:
Major group	First digit	Major group 2: Professionals
Sub-major group	First 2 digits	Sub-major group 22: Health Professionals
Minor group	First 3 digits	Minor group 221: Medical doctors
Unit group	First 4 digits	Unit group 2211: Generalist medical practitioners

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Occupation Classification

Occupation classifications are essentially skill-based and therefore closely reflect educational attainment levels.

Chief Information Officer Classification. The ISCO 08 Code (http://www.ilo.org/public/english/bureau/stat/isco/docs/d5a.pdf) Major Group 1 "Information and communications technology service managers" includes Chief Information Officers. Information and communications technology service managers plan, direct, and coordinate the acquisition, development, maintenance and use of computer and telecommunication systems within organisations.

Health Care Professional Classification: Medical Doctors: Generalist medical practitioners. Given the range of tasks and different levels of qualifications of health care professionals, the ILO has developed the following definition of Generalist medical practitioners:

Major Group 2- Sub-Major Group 22 -Health Professionals, Minor group 221, Unit Group 2211 - Medical Doctors: Generalist medical practitioners. Medical doctors study, diagnose, treat and prevent illness, disease, injury, and other physical and mental impairments in humans through the application of the principles and procedures of modern medicine. They plan, supervise and evaluate the implementation of care and treatment plans by other health care providers, and conduct medical education and research activities.

- Tasks performed usually include: conducting physical examinations of patients and interviewing them and their families to determine their health status ; ordering diagnostic tests and analysing findings; prescribing and administering curative treatments and preventive measures; performing surgery and other clinical procedures; monitoring patients' progress and response to treatment; advising on health, nutrition and lifestyle behaviours which aid prevention or treatment of disease and disorders; identifying and managing complications before, during and after childbirth; planning, managing and implementing referral plans for patients in need of specialized, long-term or other types of health care services; exchanging medical information with other health professionals to ensure continuing and comprehensive care; reporting births, deaths and notifiable diseases to government authorities; conducting research into human disorders and illnesses and preventive or curative methods.

- Generalist medical practitioners do not limit their practice to certain disease categories or methods of treatment, and may assume responsibility for the provision of continuing and comprehensive medical care to individuals, families and communities.

- Inclusion

- General practitioners

- District medical doctors - therapists

- Family medical practitioners

- Primary health care physicians

- Medical doctors (general)

- Medical officers (general)

- Medical interns or residents specialising in general practice or without any area of specialization [10]

- • Exclusion

- Pediatricians

- Obstetricians and gynecologists

- Specialist physicians (internal medicine)

- Psychiatrists

- Clinical officers

- Feldschers

Box 4. Collecting Data from Primary Care/GPs –Country Specific Challenges

In some countries - primary and secondary care- may be carried out by Health care Maintenance Organisations (HMOs). An example is Maccabi Healthcare Services in Israel.

Most HMOs in Israel today use EMRs. The proportion of "private" outpatient care in which the physician is not using one of the HMOs EMR is negligible. CIOs in Israel would probably be able to answer most of the Model Survey questions addressing "availability" of specific system functions.

It is unlikely, however, that they would be able to deliver comparable and accurate responses on "use".

If Israel (or other countries) decides to pursue this approach, the associated results may still be of interest, however, they may not be internationally comparable. Comparability would be strengthened by conducting reliability testing with a sample of target respondents (i.e., Primary Care/GPs) to ensure that responses are consistent with those provided by the corresponding CIO.

Sections B-D of Part I and II of the model survey ask about the availability of functionalities and frequency of use. It was recognized by task force chairs that a single respondent may not be best equipped to answer both.

In the hospital setting, CIOs are, in general, best positioned to answer questions about functionalities, they would have less information on frequency of use which may vary across hospital departments. It was felt, however, that it was not feasible to ask countries to recruit multiple respondents for each part of the survey.

Experts therefore recommend that countries ask CIOs to report on the availability of functionalities as well as estimate the frequency of the use of system functionalities.

On the ambulatory side, Generalist Medical Practitioners should be able to answer questions on both the availability and use of system functions.

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[10] (Note: Medical interns and residents who have completed a basic medical university education and are undertaking postgraduate clinical training are included here, if they are specialising in general practice or if they have not chosen their area of specialisation yet. Although in some countries 'general practice' and 'family medicine' may be considered as medical specialisations, these occupations should always be classified here.)

3- Contextual Information and Glossary of Key Terms

Additional contextual information may be needed to appropriately interpret responses. This information can be gathered through a range of national and international sources. Important contextual elements are addressed in Section A of both Part I and Part II and include:

- Organisational characteristics (e.g., size, institutional type)

- Date and time period that the survey was conducted

- The time-period to which the questions refer. (The recommendation is to ask respondents about availability/use over the past 3 months.)

A number of terms included in the survey may be understood and used differently by respondents. For this reason, a Glossary of Key Terms (Annex I) was developed and should be included in the survey. Box 5 lists examples of sources used for the Glossary.

Countries should consider supplementing the Glossary, where needed, in order to ensure that respondents understand the questions in their local context.

Box 5. Examples of Sources Used for the Glossary

ICT Development Index (IDI). Source published in the ITU Measuring the Information Society (MIS) Report, see: http://www.itu.int/ITU-D/ict/publications/idi/material/2012/MIS2012_without_Annex_4.pdf

Includes 11 weighted indicators of ICT access, use, and skills (e.g. broadband penetration).

ITU releases reports annually for some 155 countries. Current report was published in 2012 (2011 data).

ICT Price Basket ICT Price Basket (IPB), published in the ITU Measuring the Information Society (MIS) Report, see: http://www.itu.int/ITU-D/ict/publications/idi/material/2012/MIS2012_without_Annex_4.pdf

The ICT Price Basket (IPB) measures the affordability of ICT services (fixed telephone, mobile-cellular and fixed-broadband). ITU also publishes the price data for these ICT services for some 160 countries.

ITU publishes the IPB annually for some 160 countries. Current report was published in 2012 (2011 data).

Countries reporting national telehealth policies. Source: http://www.who.int/goe/publications/goe_telemedicine_2010.pdf

Documents the state of telemedicine policies and strategies that can be used to outline the visions and objectives regarding the application, provision, control, standards, and ethics related to the national and international use of telemedicine solutions. Such policies may facilitate and enable telemedicine adoption and assessment of the services.

WHO published its latest report in 2010 for 114 countries (2009 data).

OECD Health Data. Source:
http://www.oecd.org/health/healthpoliciesanddata/oecdhealthdata2012.htm

Includes health, health care, demographic, and economic indicators which may provide context for the interpretation of telehealth comparisons.

OECD releases data annually for 40 countries. Current report was published in 2012.

4- Characteristics of Data Collection and Analysis

There are three major types of data on Health ICT availability and use identified to date across OECD countries (OECD, 2010)[11]. These are:

- surveys of health care providers

- surveys of health care administrators

- administrative data

For all types of data, it is expected that countries will report metadata including the following information:

Sample frame: the material or device from which a sample of the survey target population was drawn.

Sample method: the method employed to select a sample from the sample frame. Methods include simple random sample, stratified sample, cluster sample, etc. ***The recommendation is to conduct a census (no sampling) or a random sample in order to be able to calculate the margin of error in the results.***

Mode of data collection/survey administration: this may include telephone, face-to-face interview, administrative records, postal mail, online, etc.

Sample size of the survey: the sample size of the survey refers to the number of people and/or institutions included in the survey sample. (See Box 6 below for an example.)

Response rate of the survey: the response rate refers to the number of people and/or institutions who answered the survey divided by the number of people and/or institutions in the survey sample. It will be important for countries to report the percentage of responses through each mode of survey administration. (See Box 7 below for strategies to increase response rates.)

Missing data (missing to reply to some of the questions): even with a mandatory survey, there will be some non-response. It will then be important to consider how the results should be reported (e.g. report the percentage of missing data), weighted and, especially with a low response rate, calibrated. It may be useful for countries to report reasons for non-response, if possible.

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[11] OECD (2010), Improving Health Sector Efficiency: The Role of Information and Communication Technologies, OECD Health Policy Studies, OECD Publishing, Paris.

National Representation: countries will need to assess whether the sample frame and sampling method used to create benchmark measures are nationally representative or not.

Weighting and clustering: a grossing up method, or weighting procedure, is used to create nationally representative benchmark measures. Primary data will typically refer to a single unit (be it a hospital, a group of hospitals, or a primary care centre). This type of information may need to be complemented with data on *output* (e.g. how many treatments of a certain kind are administered per year, how many patients attend the centre, etc.), to be able to weigh the primary data and get indicators on, for example, *population coverage* of given practices (e.g. electronic prescriptions). (See Box 8 below for examples).

Box 6. Example Sample Size Calculation

- A key question facing countries seeking to conduct a national survey is whether to conduct a census (i.e., survey all hospitals or GPs), or a sample (i.e., a subset of hospitals or GPs). If a country decides to pursue a sample, a key question is how many units must be surveyed in order to produce valid nationally representative rates of health ICT availability and use.

- There are a variety of approaches to sampling (e.g., simple random sample, complex probability sample), but regardless of approach, a decision must be made about how many units to sample.

- Two important considerations include:

  - The degree of uncertainty that a country is willing to accept in their estimated national rates

    o The *confidence level* indicates a degree of certainty (as a percentage) that the actual result falls within a given range of values. The most typical confidence level is 95%.

    o The *confidence interval (margin of error)* is a plus-or-minus percentage that is a range determined by the confidence level. For example, if a ±5% confidence interval is used, and 50% of the sample gives a specific answer for a question, the actual result for that question falls between 45% and 55% (50% ± 5%).

  - The anticipated response rate

- Assuming, in the simplest case, that a country wants to pursue a simple random sample, a sample size calculator can be used to generate the target sample size once the confidence level and confidence interval are decided. The resulting number should be inflated based on the expected response rate. That is, if the response rate is anticipated to be 65% and the sample size calculation suggests surveying 500 hospitals, an additional 269 ([500/0.65] - 500) hospitals should be surveyed, for a total of 769.

- More complex approaches to sampling will require more complex approaches to sample size calculations. The following references provide more detail on these approaches:

Suggested References

Fowler, F.J. "Survey Research Methods – Fourth Edition". Sage Publication Inc. 2009. ISBN: 9781412958417.

Kalton, G. "Introduction to Survey Sampling". Sage Publications Inc. 1983. ISBN: 0803921268.

Kish, L. "Survey Sampling: Wiley Classics Library Edition". John Wiley and Sons, Inc. 1995. ISBN: 0471109495.

Box 7. Best Practices for Increasing Response Rates

Why Worry about Response Rate?

- Four Main Types of Survey Error and Bias

  1. Sampling Error: The result of sampling some, not all, elements of the survey population

  2. Coverage Bias: The result of not allowing all members of the survey population to have a chance of being sampled for participation in the survey

  3. Measurement Error: The result of poor question wording or questions being presented in such a way that inaccurate or un-interpretable answers are obtained

  4. Non-Response Bias: The result of people who respond to a survey being different from sampled individuals who did not respond in a way relevant to the study

  Increasing participation helps reduce Non-Response Bias and Sampling Error.

How have other Health ICT surveys encouraged responses?

- The Commonwealth Fund: Incentives

- Specific amounts were: $25 per response in the US and Canada; $50 in Australia; 30 pounds in the UK. These amounts yielded response rates ranging from 24% (UK) to 47% (Australia).

- Brazil: Official Request from the Health Ministry

Some Rules of Thumb for Increasing Response Rates

- FIRST CONTACT MATTERS: Keep the initial communication short, direct, and personal

- SHARE THE RESULTS: Offer your respondent the opportunity to see the survey results.

- IDENTIFY OTHERS WHO CARE ABOUT THE SURVEY RESULTS: All of the people who care about the survey results can help prepare your respondents by raising awareness of the survey.

- MULTIPLE CONTACTS AND SEND REMINDERS: There is no magic number and each reminder will result in fewer responses. However, respondents are typically busy and many even expect to receive reminders.

- TANGIBLE INCENTIVES: A tangible incentive does not have to have a lot of monetary worth. But it has to show that you know and respect your respondents and that you are at least trying to say "thanks for your time." In some cases, respondents are not allowed to accept incentives and so they should be given the option to opt-out of receiving one. Some options include:

  o Offer a "thank-you" gift – a coffee card, a USB drive, desk knick-knack – to those who respond.

  o Offer a charitable gift (e.g., we will donate $X to one of the following charitable organisations).

  o Offer a lottery. Take the total cash you have budgeted for "thank-you" gifts and offer it as a cash prize to one randomly selected winner.

Suggested References

Lisa Klein. Increasing Survey Response Rates. University of Wisconsin Survey Center.

Dillman DA, Smyth J, Christian L. *Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method*. 3rd Edition. Hoboken, NJ: John Wiley & Sons, Inc; 2009.

Edwards P, Roberts I, Clarke M, DiGuisepi C, Pratap S, Wentz R, et al. Increasing response rates to postal questionnaires: systematic review. *British Medical Journal* 2002; 324(7347):1183–1185. Available at http://www.bmj.com/cgi/reprint/324/7347/1183.

CDC. Increasing Questionnaire Response Rates. July 2010.

Box 8. Weighting Techniques

Why Weight?

There are a variety of reasons to weight and a variety of techniques for doing so. The appropriate approach will be driven by your approach to data collection.

Example 1: Weighting to Adjust for Non-Response Bias in a Census (i.e., No Sampling)

A simple example comes from the experience in the United States with calculating a national electronic health record adoption rate among hospitals. The approach is to conduct a census (i.e., no sampling) and response rates are typically around 65%. This creates a need to adjust for potential non-response bias (i.e., some types of hospitals are more likely to respond than others) in order to generate a nationally representative estimate. To do this, an inverse probability weight is created as follows:

(1) Key hospital characteristics are selected that capture the relevant dimensions of the population (e.g., size, teaching status, ownership, geographic location)

(2) Predicted probability of response is created for each hospital by running a logistic regression with a dependent variable of whether or not the hospital responded to the survey.

(3) The inverse of the predicted probability is calculated for each hospital and used to create a weighted EHR adoption rate.

Example 2: Weighting to Adjust for a Stratified Random Sample

Consider the following example of a stratified random sample, which is useful when the population is heterogeneous and it is possible to establish strata which are reasonably homogenous. We may wish to estimate the national proportion of hospitals that have adopted an electronic health record. Suppose that in a country, there are the following numbers of hospitals within three different health regions:

Health region one: 20 hospitals (5 have an electronic health record)
Health region two: 30 hospitals (10 have an electronic health record)
Health region three: 50 hospitals (35 have an electronic health record)
Total: 100 hospitals (50 have an electronic health record)

The national proportion of hospitals with an electronic health record is therefore 50 / 100 or 50%.

Let's assume we are asked to take a sample of 30 (10 per strata) hospitals, stratified by the above three health regions and estimate the total number of hospitals with an electronic health record. The first step is to find the total number of hospitals (100) and calculate the percentage in each stratum.

Health region one = 20 / 100 = 0.2
Health region two = 30 / 100 = 0.3
Health region three = 50 / 100 = 0.5

These values become our strata weights and add up to 1: $\sum_1^3 W_i = 0.2 + 0.3 + 0.5 = 1$

In our sample of 30, assume we obtain the following number of hospitals with an electronic health record:

Health region one: 3 hospitals or 0.3 (30%) of the stratum sample with an electronic health record
Health region two: 4 hospitals or 0.4 (40%) of the stratum sample with an electronic health record
Health region three: 6 hospitals or 0.6 (60%) of the stratum sample with an electronic health record

The number of hospitals in the country, $\bar{y}$, with an electronic health record, estimated from our sample, is:

$$\bar{y} = \sum_1^3 W_i \bar{y}_i = 0.2 \times 0.3 + 0.3 \times 0.4 + 0.5 \times 0.6 = 0.48 \text{ or } 48\%$$

Source: *John Orav, Julia Adler-Milstein and Ashish Jha (United States)*

Suggested References

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Kish, L. "Survey Sampling: Wiley Classics Library Edition". John Wiley and Sons, Inc. 1995. ISBN: 0471109495.

For an example of weights in the context of a complex, multi-stage, probability sample, please refer to this website.

Box 9. Cognitive Testing

From the Regional Center of Studies for the Development of the Information Society under the Auspices of UNESCO

Cognitive interviewing is a technique of evaluating survey questions by using several strategies to find out how the respondents understand the questions and how they arrived at their answers. Since its conception in the mid 1980's, this technique has been particularly useful for evaluating new questions and identifying possible sources of error before administering survey questionnaires. Since 2009, Cetic.br has carried out cognitive interviews with the objective of learning how Brazilian respondents understand the critical concepts of various questionnaires for projects such as ICT Households, ICT in Education, ICT in Health Sector, ICT Kids Online, ICT in Non-Profit Organisations, ICT e-Government.

One of the most important uses of cognitive interviews is to evaluate translation and adaptation issues of cross-national questionnaires, identifying possible sensitivities to specific issues and ensuring that the questions were appropriate for each target population, among others.[1] Due to Brazil's enormous social, economic and cultural diversity, cognitive interviews also play an important role in ensuring the design of data collection instruments apply nationwide.

In Cetic.br experience, the cognitive interviews follow at least four complementary procedures:

1. Concurrent or retrospective "think-aloud" interviews: the respondent speaks their thoughts while answering questions or recalls their thoughts directly afterwards;

2. Probing: asking a follow-up question after each question or group of questions;

3. Paraphrasing: the respondent rephrases the question in his or her own terms;

4. Definitions: asking for the respondent to explain key terms.[2]

Some Practical Guidelines

Based on the Cetic.br experience, and following international standards, the following practical guidelines may be useful:

- Administer at least 20 interviews to each questionnaire, in order to count on a minimal diversity of respondents;

- The use of controlled environments (mirrored room) has brought good results;

- Cognitive interviews are carried out in two different phases, allowing different aspects to be evaluated in each phase, and for a revised version of the questionnaire to be tested;

- Audio and video recording is an important tool;

- Interviewers might have experience in qualitative approach and Psychology background is desirable;

- Develop a sound process of documentation, including reports on each phase.

Capacity Building

Another critical aspect to the consolidation of cognitive interview in our center is the promotion of high level capacity building efforts. The most important example is the creation of the *NIC.br Workshop on Survey Methodology*, which is an annual event designed with the aim of creating a space for the discussion and training in ICT survey methodologies, both through quantitative and qualitative approaches. The Workshop aims to develop conceptual and theoretical skills among producers and consumers of ICT statistics, focusing on methodological rigor in surveys, the application of qualitative and quantitative methods, and techniques of data analysis and presentation.[3] In 2013, a Short Course on "Quality Survey Outcomes: Planning, testing and Implementation", administered by Pamela Campanelli, PhD from the "The Survey Coach UK" covered issues like "What cognitive interviewing is", "The full range of cognitive interview techniques", "How to actually conduct a cognitive interview", "Sampling for and analysis of cognitive interviews" and "Highlights of current trends and issues in cognitive interviewing methodology".

Notes

1 In 2012, CETIC.br conducted the Kids Online Brazil Survey for the first time to measure risks and opportunities related to the Internet use among the population aged 9 to 16. The questionnaires used in the ICT Kids Online Brazil survey were based on those developed for the EU Kids Online and followed the framework designed by the London School of Economics (http://www.lse.ac.uk/media@lse/research/EUKidsOnline/Home.aspx). The European questionnaires were translated into Portuguese from the master questionnaires in English and then adapted to the Brazilian context.

2 Adapted from: Groves, R. M., Fowler, F. J., Couper, M. P., Lepkowski, J., M., Singer, E., & Tourangeau, R. (2009). Survey methodology (2nd ed.). New York: Wiley.

3 More information on: http://cetic.br/semana-metodologias-pesquisas/english/index.html

Suggested References

Campanelli, P. (1997), Testing Survey Questions: New Directions in Cognitive Interviewing, Bulletin de Methodologie Sociologique,55,5-17.

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Data Collection Frequency

It is recommended that data be collected and reported every other year at a minimum, though the decision on data collection frequency will likely be heavily influenced by the policy needs of a country.

If a survey is used, it is recommended that cognitive testing of the survey instrument be performed to ensure that translation and other changes have not altered the interpretation of the questions. Box 9 below provides an example of this process.

Data Sources

A number of OECD countries have so far reported that they are currently utilising routine administrative data to monitor ICT use in health care (see example in Box 10). The use of administrative data generally has great appeal for policy makers because it is readily available. The downside of the approach is that data compiled from such sources often suffer from the limitation that the administrative data systems are, generally, a rather inflexible statistical instrument as they cannot be modified to serve

specific collection purposes. The methodology, however, is worth further exploration as a large number of countries may well have, or may use electronic systems for administrative data collection in the future.

In case a country decides to report data based on existing/planned surveys and/or administrative data, it will be important for that country to additionally report:

- **The name(s) of the organisation or body that manages** or is responsible for the information system or data set from which the indicator was calculated.

- The name of the information system, and data source type from which the indicator was calculated.

Countries will be asked to report data for each individual question that they include from the model survey. There will *not* be an effort to create composites or other measures that draw on responses to multiple questions.

Cost of Data Collection and Analysis

Countries should assess the cost, timelines and feasibility associated with data collection and analysis. Country-wide surveys can be costly and take a substantial amount of time to reach and follow-up with potential respondents.

Box 10. Best Practices in Using Administrative Data

From Jeremy Thorp and Henry Pares (England)

Types of Measure & Mechanisms for Measurement

There are two types of health ICT measures for which England uses administrative data.

(1) Input: Availability, such as "numbers of GPs whose systems allow patient access"

- These are fairly straightforward to measure (i.e., factual/quantitative)
- Sources include:

  - Automated national collection of (e.g.) registrations, smart cards, number of summary care records, etc.
  - National contract records of connections, systems

(2) Output: Usage of services, such as % of bookings made electronically

- These are less straightforward to measure but still quantitative
- Sources include:

  - Automated national collection of (e.g. number of accesses, transactions such as bookings, prescriptions)

The two types of sources of administrative data are both complete, but differ as follows:

- Automated data capture implies national infrastructure to report or collate data
- National collection implies that data is not automatically available but can easily be derived (e.g. from contracts records)

Lessons Learned

- There is an inverse relationship between the ease of collecting the data and its value

- Input measures are largely factual and hence easier to manage but of little value in demonstrating health gain. However, input measures are a necessary first step to test for the existence of a capability.

- Input measures often raise questions about output measures. For example, why is it that 95% + of practices have the ability to book appointments, but only 50% of bookings are carried out electronically? The answers won't come from the administrative data, but at least it offers a basis from which to start to explore the issues.

- Often the first response to unflattering figures is "the data must be wrong" but is best addressed by beidemonstrating the provenance of the data (i.e., where the data came from).

- England has an advantage in running a national health service, so denominators are the whole population – other countries would need to reflect their own local circumstances and may have more difficulty assessing appropriate denominators for key metrics.

ANNEX I. GLOSSARY OF TERMS AND DEFINITIONS

These definitions are explanatory and may not apply to all OECD countries.

Acute care: Acute care is one in which the principal intent is one or more of the following:
to manage labour (obstetrics)
to cure illness or to provide definitive treatment of injury
to perform surgery
to relieve symptoms of illness or injury (excluding palliative care)
to reduce severity of an illness or injury
to protect against exacerbation and/or complication of an illness and/or injury which could threaten life or normal function
to perform diagnostic or therapeutic procedures.

 http://stats.oecd.org/glossary/detail.asp?ID=4

Ambulatory patient care: Individuals receiving health services without admission to a hospital or other facility *Source: NAMCS*

Asynchronous Telehealth Consultation:

Store-and-forward, or asynchronous, telemedicine involves the exchange of pre-recorded data between two or more health professionals at different times. For example, a primary care provider captures an image of a wound and electronically sends it to a specialist, who later sends back an opinion regarding diagnosis and optimal management. Source: Modified from WHO and Rao and Lombardi (2009)

Book appointments online: This requires a semi-automated or a fully electronic process; the ability to send an email to ask if an appointment can be booked does not meet the definition.

Clinical notes: Clinical notes provide a concise review of a particular topic in order to enhance the education of fellows, residents and medical students. Records which relate to the physical or mental health of an individual which have been made by or on the advice of a health professional in connection with the care and treatment of that person. Source: Orion Health

Electronic health record:

An electronic health record (EHR) refers to the longitudinal electronic record of an individual patient that contains or virtually links records together from multiple Electronic Medical Records (EMRs), which can then be shared across health care settings (interoperable). It aims to contain a history of contact with the health care system for individual patients from multiple organisations that deliver care. *Source: OECD*

Electronic medical record/Electronic patient record:
An electronic medical record (EMR) or electronic patient record (EPR) is a computerised medical record created in an organisation that delivers care, such as a hospital or physician's office, for patients of that organisation. EMR/EPR is provider or organisation centric and allows storage, retrieval and modification of patient records. *Source: OECD*

General practitioners/Primary care physicians: Physicians who delivery primary care (per definition above).

Other international definitions include:

(1) General practitioners (or "family doctors") assume responsibility for the provision of continuing and comprehensive medical care to individuals, families and communities.

Inclusion

- General practitioners

- District medical doctors - therapists

- Family medical practitioners ("family doctors")

- Medical interns or residents specialising in general practice

Exclusion

- Paediatricians

- Other generalist (non-specialist) medical practitioners

Notes:

- Although in some countries "general practice" and "family medicine" may be considered as medical specialisations, these occupations should always be classified here.

- Offices of general medical practitioners (HP.3.1.1 in SHA 2011) include establishments of doctors who hold a degree in medicine and are primarily engaged in the independent practice of general medicine.

Source: OECD Health Data 2012. June 2012. http://www.oecd.org/health/healthdata.

(2) The characteristics of the discipline of general practice/family medicine are that it:

- is normally the point of first medical contact within the health care system, providing open and unlimited access to its users, dealing with all health problems regardless of the age, sex, or any other characteristic of the person concerned.

- makes efficient use of health care resources through co-ordinating care, working with other professionals in the primary care setting, and by managing the interface with other specialities taking an advocacy role for the patient when needed.

- develops a person-centred approach, orientated to the individual, his/her family, and their community.

- promotes patient empowerment.

- has a unique consultation process, which establishes a relationship over time, through effective communication between doctor and patient.

- is responsible for the provision of longitudinal continuity of care as determined by the needs of the patient.

- has a specific decision making process determined by the prevalence and incidence of illness in the community.

- manages simultaneously both acute and chronic health problems of individual patients.

- manages illness which presents in an undifferentiated way at an early stage in its development, which may require urgent intervention.

- promotes health and well-being both by appropriate and effective intervention.

- has a specific responsibility for the health of the community.

- deals with health problems.

Source: WONCA

In-patient care:

In-patient care refers to care for a patient who is formally admitted (or 'hospitalised') to an institution for treatment and/or care and stays for a minimum of one night in the hospital or other institution providing in-patient care.

In-patient care is delivered in hospitals, other nursing homes and residential care facilities or in establishments which are classified according to their focus of care under the ambulatory care industry, but perform in-patient care as a secondary activity.

Included are services delivered to in-patients in prison and army hospitals, tuberculosis hospitals and sanatoriums. In-patient care includes accommodation provided in combination with medical treatment when the latter is the predominant activity provided during the stay as an in-patient. Source: *OECD, OECD Health Data 2012. June 2012. http://www.oecd.org/health/healthdata.*

Out-patient care:

Out-patient care refers to care for a patient that is not formally admitted to the facility (physician's private office, hospital out-patient centre or ambulatory-care centre) and does not stay overnight. An out-patient is thus a person who goes to a health care facility for a consultation/treatment, and who leaves the facility within several hours of the start of the consultation without being "admitted" to the facility as a patient. It should be noted that the term "out-patient" used in the OECD's Systems of Health Accounts has a wider meaning compared to this survey where this term is limited to care in out-patient wards of hospitals. Source: *OECD,* OECD Health Data 2012*. June 2012. http://www.oecd.org/health/healthdata.*

Outside your organisation: Refers to a setting that is not *part of* your organisation (i.e., different ownership and/or governance). Different locations of the same organisation are not considered to be "outside" in this context. This concept is likely to be very country and region specific. There may be instances in which countries feel that data would be most accurately captured by either: (1) adding a question to Section A that assesses how the respondent defines the boundaries of their organisation (i.e., who is "inside" and who is "outside"). Alternatively, countries can modify questions to define for the respondent who should be considered "inside" and who should be considered "outside". For example, in a country/region in which all facilities are under the same governance, "inside" may be defined as within the practice or hospital in which the respondent works and outside may refer to any other setting, even if it is under the same governance.

Patient summaries:

A patient summary is a concise clinical document that provides an electronic patient health data set applicable both for unexpected, as well as expected, healthcare content. It is a standardised set of basic health data containing: general information about the patient (e.g. name, birth date, gender, etc.); medical summary consisting of the most important clinical patient data (e.g. allergies, current medical problems,

medical implants, or major surgical procedures during the last six months); list of current medications including all prescribed medication that the patient is currently taking; information on when information was entered and by whom. *Source: epSOS*

Primary care:

Primary care is the level of a health services system that provides entry into the system for all new needs and problems, provides person-focused (not disease-oriented) care over time, provides care for all but very uncommon or unusual conditions, and coordinates or integrates care, regardless of where the care is delivered and who provides it. *Source: John's Hopkins Primary Care Policy Center*

Primary care is the provision of *integrated, accessible health care services* by *clinicians* who are *accountable* for addressing a large *majority of personal health care needs*, developing a *sustained partnership* with *patients*, and practicing in the *context of family and community.*

Integrated is intended in this report to encompass the provision of *comprehensive, coordinated*, and *continuous* services that provide a seamless process of care. Integration combines events and information about events occurring in disparate settings, levels of care and over time, preferable throughout the life span.

Comprehensive.care addresses any health problem at any given stage of a patient's life cycle.

Coordinated.ensures the provision of a combination of health services and information that meets a patient's needs. It also refers to the connection between, or the rational ordering of, those services, including the resources of the community.

Continuous.is a characteristic that refers to care over time by a single individual or team of health care professionals ("clinician continuity") and to effective and timely communication of health information (events, risks, advice, and patient preferences) ("record continuity"). *Source: Institute of Medicine*

Problem list & Diagnoses:

A problem list is a list of all active problems for the patient (regardless of whether they are actively being treated). A problem list is considered distinct from diagnoses in that diagnoses are all conditions that the patients has but not all are necessarily active problems. For example, for a given patient with well-controlled diabetes, it would be a diagnosis but not on the problem list. Source: AHIMA

Secure/securely: Information security is the preservation of confidentiality, integrity and availability of information. Source: ISO

Structured order sets:

Order sets are collections of pre-formed orders that can address needs of patients and clinicians by making the right thing easier to do. Source: JAMIA 2007

Order sets are grouped medical orders that work to standardize diagnosis and treatment following pre-established clinical guidelines. Source: eHealth Innovation

Note: This may not be a concept that is used in all countries, in which case it should be removed from the survey.

Synchronous (Video) Consultation:

Real time or synchronous, telemedicine requires the involved individuals to be simultaneously present for immediate exchange of information, as in the case of videoconferencing. The intention is to capture virtual visits that would replace care that would otherwise take place in person. Real-time video consultation could cover dozens of types of clinical specialties including but not limited to: Psychiatry, Cardiology, Primary Care, and Audiology. Videoconferencing equipment is one of the most common forms of synchronous telemedicine technologies; however, peripheral devices can also be attached to computers or the videoconferencing equipment which can aid in an interactive examination. This type of telemedicine does not include exchanges via email nor telephony services (e.g., plain old telephone service (POTS), more advanced forms including mobile phones and VOIP). Source: Modified from WHO and Rao and Lombardi (2009)

Telehealth: Use of telecommunication techniques for the purpose of providing telemedicine, medical education, and health education over a distance. Source: ISO

Telemedicine: Use of advanced telecommunication technologies to exchange health information and provide health care services across geographic, time, social and cultural barriers. Source: ISO

Teleradiology: The field of telemedicine involving the use of information and communications technologies (ICT) to transmit digital radiological images (e.g., x-ray) from one location to another for the purpose of interpretation and/or consultation. Source: WHO

Teledermatology: The field of telemedicine involving the use of ICT to transmit medical information concerning skin conditions and tumours of the skin for the purpose of interpretation and/or consultation. Source: WHO

Telepathology: A field of telemedicine involving the use of ICT to transmit digitized pathological results, such as microscopic images of cells, for the purpose of interpretation and/or consultation. Source: WHO

Telepsychiatry: A field of telemedicine involving the use of ICT for psychiatric evaluations and/or consultation via video and voice. Source: WHO

Total Hospital Beds: Total hospital beds are all hospital beds which are regularly maintained and staffed and immediately available for the care of admitted patients. ***http://stats.oecd.org/glossary/search.asp***

Remote telemonitoring:

Remote telemonitoring (sometimes referred to as telehomecare or telemonitoring), involves capturing information on vital signs or clinical indicators to monitor a patient's condition. Patients may be required to manually input data into a device and then transfer the data. More advanced technologies include automated data capture, often in real-time, and communication through the use of advanced information systems comprising wireless communication. Source: Adapted from The European Observatory on Health Systems and Policies in partnership with the World Health Organisation

Vital signs:

To be defined specifically by countries if needed, but vital signs typically include measurements such as blood pressure, weight, and height.

ANNEX II. TABLES

Table A1 – International categories of health care according to ISIC, CPC and ICHA-HP

ISIC rev 4	ISIC rev 3.1	CPC rev 1.1	ICHA-HP
Section Q: Human health and social work activities	Section N division 85: Health and social work	931: Human health services	Health providers
8610: Hospital activities	8511: Hospital activities	93110: Hospital services	HP.1: Hospitals HP.1.1: General hospitals HP.1.2: Mental health and substance abuse hospitals HP.1.3: Specialty hospitals (other than those in 1.2)
8620: Medical and dental practice activities	8512: Medical and dental practice activities	93121: General medical services 93122: Specialised medical services 93123: Dental services	HP.3: Providers of ambulatory care HP.3.1: Offices of physicians HP. 3.2: Offices of dentists
8690: Other human health activities	8519: Other human health activities	93191: Deliveries and related services, nursing services, physiotherapeutic and paramedical services 93192: Ambulance services 93193: Residential health facilities services other than hospital services 93199: Other human health services n.e.c.	HP. 3.2: Offices of other health practitioners HP. 3.4: Out-patient care centres (also under 8531) HP.3.5: Medical and diagnostic laboratories HP.3.6: Home health care services (also under 8531) HP. 3.9.1: Ambulance services HP. 3.9.2: Blood and organ banks HP. 3.9.9 All other ambulatory health care services
87: Residential care 8710: Nursing care facilities 8720: Residential care activities for mental retardation, mental health and substance abuse 8730: residential care for the elderly 8790: all other residential care	8519: Other human health activities	93191: Deliveries and related services, nursing services, physiotherapeutic and paramedical services 93193: Residential health facilities services other than hospital services 93199: Other human health services n.e.c.	HP.2: Nursing and residential care facilities (also under ISIC 3.1 8531*) HP.2.1: Nursing care facilities 8519/8531 HP.2.2: Residential mental retardation, mental health and substance abuse facilities HP.2.3: Community care facilities for the elderly 8519/8531 HP.2.9: All other residential care facilities

4772: Retail sale of pharmaceutical and medical goods, cosmetic and toilet articles in specialized stores 4773: Other retail sale of new goods in specialized stores	5231: Retail sale of pharmaceutical and medical goods, cosmetic and toilet articles 5239: Other retail sale in specialized stores	62273: Specialized store retail trade services, of pharmaceutical and medical goods 62274: Specialized store retail trade services, of surgical and orthopaedic instruments and devices	HP.4: Retail sale and other providers of medical goods HP.4.1: Dispensing chemists 5231 HP.4.2: Retail sale and other suppliers of optical glasses and other vision products HP.4.3: Retail sale and other suppliers of hearing aids HP.4.4: Retail sale and other suppliers of medical appliances (other than optical goods and hearing aids) (other than optical goods and hearing aids) HP.4.9: All other miscellaneous sale and other suppliers of pharmaceuticals and medical goods
			HP.5: Provision and administration of public health programmes
412: Regulation of the activities of providing health care, education, cultural services and other social services, excluding social security 8430: Compulsory social security activities 6512: Non-life insurance	7512: Regulation of the activities of agencies that provide health care, education, cultural services and other social services, excluding social security 7530: Compulsory social security activities 6603: Non-life insurance	9112: Administrative services of agencies that provide educational, health care, cultural and other social services, excluding social security services 9131: Administrative services of sickness, maternity or temporary disablement benefit schemes 71320: Accident and health insurance services	HP.6: Health administration and insurance HP.6.1: Government administration of health 7512 HP.6.2: Social security funds 7530 HP.6.3: Other social insurance HP.6.4: Other (private) insurance 6603 HP.6.9: All other health administration
			HP.7: All other industries (rest of the economy) HP.7.1: Establishments as providers of occupational health care services HP.7.2: Private households as providers of home care HP.7.9: All other industries as secondary producers of health care

* ISIC 8531 social work activities with accommodation and also CPC 93311 welfare services delivered through residential institutions for elderly persons and person with disabilities.

Source: Schreyer, P. (2010), "Towards Measuring the Volume Output of Education and Health Services: A Handbook", OECD Statistics Working Papers, 2010/02, OECD Publishing. http://dx.doi.org/10.1787/5kmd34g1zk9x-en

Table A2 − Cross-classification of ICHA-HC and COICOP, COFOG and COPNI

ICHA	Function of health care		COICOP Households	COICOP NPISHs	COICOP Government	COFOG	COPNI
	ICHA-HC function is mainly part of SNA93 code:						
HC.1	Services of curative care						
	HC.1.1	In-patient curative care	06.3	13.2.7	14.2.7	07.3	02.3
	HC.1.2	Day cases of curative care	06.3	13.2.7	14.2.7	07.3	02.3
	HC.1.3	Out-patient curative care	06.2	---	---	07.2	02.2
	HC.1.3.1	Basic medical and diagnostic services	06.2.1	13.2.4	14.2.4	07.2.1	---
	HC.1.3.2	Out-patient dental care	06.2.2	13.2.5	14.2.5	07.2.3	02.2.2
	HC.1.3.3	All other specialised health care services	06.2.1	13.2.6	14.2.4	07.2.3	---
	HC.1.3.9	All other out-patient curative care	06.2.3	13.2.6, (13.2.4)	14.2.6, (14.2.4)	07.2.4, (07.2.1)	02.2.2
	HC.1.4	Services of curative home care	06.1.2, (06.1.3)	13.2.4, (13.2.7)	14.2.6	07.2.4, (07.3)	02.2
HC.2	Services of rehabilitative care		---	---	---	---	---
	HC.2.1	In-patient rehabilitative care	06.3	13.2.7	14.2.7	07.3	02.2.3
	HC.2.2	Day cases of rehabilitative care	06.3	13.2.7	14.2.7	07.3	02.2.3
	HC.2.3	Out-patient rehabilitative care	06.2.3, (06.2.1)	13.2.6, (13.2.4)	14.2.6, (14.2.4)	07.2.4, 07.2.1	02.2.3
	HC.2.4	Services of rehabilitative home care	06.2.3	13.2.6	14.2.6	07.2.4, (07.3)	02.2.3, (02.3)
HC.3	Services of long-term nursing care						
	HC.3.1	In-patient long-term nursing care	06.3	13.2.7	14.2.7	07.3	02.3
	HC.3.2	Day cases of long-term nursing care	06.3	13.2.7	14.2.7	07.3	02.2.3
	HC.3.3	Long-term nursing care: home care	06.3, (06.2.3)	13.2.7, (13.2.6)	14.2.7, (14.2.6)	07.3, (07.2.4)	02.2.3, (02.3)
HC.4	Ancillary services to health care						
	HC.4.1	Clinical laboratory	06.2.3, (06.2.1)	13.2.6	14.2.6	07.2.4	02.2.3
	HC.4.2	Diagnostic imaging	06.2.3, (06.2.1)	13.2.6	14.2.6	07.2.4	02.2.3
	HC.4.3	Patient transport and emergency rescue	06.2.3, (06.3)	13.2.6, (13.2.7)	14.2.6, (13.2.7)	07.2.4	02.2.3, (02.3)
	HC.4.9	All other miscellaneous ancillary services	06.2.3	13.2.6	14.2.6	07.2.4	02.2.3

Source: Schreyer, P. (2010), "Towards Measuring the Volume Output of Education and Health Services: A Handbook", OECD Statistics Working Papers, 2010/02, OECD Publishing. http://dx.doi.org/10.1787/5kmd34g1zk9x-en

Table A3 – OECD System of Health Accounts (SHA) Definitions and Sources of Hospital Data (2013)

Australia

Source of data: **Australian Institute of Health and Welfare**. Australian hospital statistics. Canberra: AIHW, Table 2.1 (also at www.aihw.gov.au).
Coverage: Data include public and private (private acute, private psychiatric and private free-standing day) hospitals.

Austria

Source of data: **Austrian Federal Ministry of Health**, Hospital Statistics.
Reference period: 31st December.
Coverage: Complete (HP.1).

Belgium

Source of data: **Federal Service of Public Health, Food Chain Safety and Environment**.
Coverage: All institutions recognised as hospitals are covered.

Canada

Source of data: **Canadian Institute for Health Information**, Canadian MIS Database, 1995/1996-2010/2011. **Eco-Santé Québec 2012/2013**, December 2012 update, for hospitals in Quebec.
Coverage: In the Canadian MIS Database, hospitals are defined as institutions where patients are accommodated on the basis of medical need and are provided with continuing medical care and supporting diagnostic and therapeutic services. Hospitals are licensed or approved as hospitals by a provincial/territorial government or are operated by the government of Canada and include those providing acute care, extended and chronic care, rehabilitation and convalescent care, and psychiatric care.

Chile

Source of data: Health Statistics from the "Statistical Compendium" by the **National Statistics Institute** (INE in Spanish www.ine.cl). The original source of the data is the **Ministry of Health** (MINSAL), Department of Health Statistics and Information (DEIS).
- Data up to 2009: Statistical Compendium 2011 (and previous reports), INE. Health Statistics.
http://www.ine.cl/canales/menu/publicaciones/compendio_estadistico/compendio_estadistico2011.php.
- 2010 and 2011 data are taken directly from the DEIS's Health Statistical System called REM and REMSAS.
- Annual periodicity.
Coverage: Nationwide.
- Data include Hospitals from the Private Sector and Hospitals from the National System of Health Services (SNSS).

Czech Republic

Source of data: **Institute of Health Information and Statistics of the Czech Republic**. Registry of Health Establishments.
Reference period: 31st December.
Coverage: Hospitals and specialised therapeutic institutes (excluding balneologic institutes, convalescence homes for children, institutes for long-term patients and hospices).

Estonia

Source of data:
- Since 1st January 2008 **National Institute for Health Development**, Department of Health Statistics. www.tai.ee

- Data from routinely collected health care statistics, submitted by health care providers (monthly statistical report "Hospital beds and hospitalisation") and from the **Registry of Health Board** (in-patient care licences).
Reference period: 31st of December.
Coverage:
- All hospitals HP.1 (public and private sector) are included.
Note:
- The decrease in the number of hospitals after 1991 was the result of the first reorganisation wave of the health care system of the independent country. The concentration of the changes in terms of the number of health care providers is most well-observed when comparing figures from 1994 and 1995.
- In 2002, the Government of Estonia introduced the Hospital Master Plan that anticipates an optimum number of hospitals and hospital beds necessary to provide acute health care services taking into account the number of the population of Estonia and the population forecasts. Therefore, existing hospitals were reorganised, some became out-patient care providers, and some were closed or consolidated. This change can be called the second wave of the reorganisation of the Estonian health care system.
- Data for 2003-2011 are recalculated. (Small changes from reviewing the HP classification of institutions providing in-patient care according to the new SHA 2011.)

Finland

Source of data: **National Institute for Health and Welfare** (THL), Care Register for Institutional Health Care.
Coverage: All hospitals.
Break in time series: 2000. The series was recalculated from 2000 onwards to correspond to the SHA 2011 definitions.

France

Source of data: **Ministère de la Santé et des Sports - Direction de la Recherche, des Etudes, de l'Evaluation et des Statistiques** (DREES). Data are from the "Statistique Annuelle des Établissements de santé (SAE)".
Reference period: 31st December.
Coverage:
- Data refer to metropolitan France and D.O.M. (overseas departments).
- Data from 2000 include only hospitals with capacities for complete or partial hospitalisation (which differs from conventions used in the previous years). Data from 2002 include the army hospitals. For the public sector, it is the legal entities that are taken into account (there can be several geographical establishments); for the private sector, it is establishments.

Germany

Source of data: **Federal Statistical Office**, Hospital statistics (basic data of hospitals and prevention or rehabilitation facilities); Statistisches Bundesamt, *Fachserie 12, Reihe 6.1.1*, table 1.1 and ibid. *Fachserie 12, Reihe 6.1.2*, table 1.1; http://www.destatis.de or http://www.gbe-bund.de.
Reference period: 31st December.
Coverage:
- Hospitals comprise all types of hospitals (HP1.1, 1.2 and 1.3) in all sectors (public, not-for-profit and private).
- Included are general hospitals, mental health hospitals and prevention and rehabilitation facilities.
- Long-term nursing care facilities are excluded.

Greece

Source of data: **Hellenic Statistical Authority (EL.STAT.)**.
Reference period: 31st December.

Hungary

Source of data: From 1994 **Hungarian National Health Insurance Fund** (OEP), Statistical Yearbook.
www.oep.hu.
Coverage: Number of hospitals at the end of the year (including public, not-for-profit and for-profit hospitals) under contract with OEP, as well as 2 prison infirmaries run by the Ministry of Justice. Does not include hospitals not under contract with OEP. The number of these hospitals is negligible.

Iceland

Source of data:
- Up to 2006: **The Directorate of Health**.
- From 2007: **The Ministry of Welfare**.
Coverage:
- Up to 2006, the number of hospitals includes specialized and general hospitals, rehabilitation institutions and a treatment centre for alcohol and drug abusers. All nursing homes and retirement homes are excluded.
- From 2007, Hospitals refer to health care facilities with 24-hour access to a hospital physician.
Break in time series: 2007.

Ireland

Source of data: **Department of Health and Children** and Mental Health Commission.
Coverage: Since 2009, figures refer to HP1 hospitals, both public and private. Data are comprised of general (acute) hospitals, approved psychiatric centres and specialty hospitals.
Break in time series: Up to 2008, figures refer to publicly funded acute hospitals, district/community hospitals, geriatric hospitals and psychiatric hospitals. Private short-stay hospitals were not included.

Israel

Source of data: The data are based on the Medical Institutions License Registry maintained by the Department of Medical Facilities and Equipment Licensing and the Health Information Division in the **Ministry of Health**.
Reference period: End of the year.
Coverage: Includes all acute care, mental health and specialty hospitals; excludes nursing and residential care facilities.
Note: The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities.
The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Italy

Source of data: **Ministry of Health – D.G. of Health Information System - Office of Statistics**.
Coverage: Data up to 2003 included public hospitals but not all private hospitals; only private hospitals accredited by the National Health Service were included. Since 2004 all private hospitals are counted; private hospitals not accredited by the National Health Service are also included. The previous definition has been modified in order to make this indicator coherent with the hospital discharge indicators referring to all hospitals, both public and private.
Break in time series: 2004.

Japan

Source of data: **Ministry of Health, Labour and Welfare**, Survey of Medical Institutions.
Coverage: Medical institutions where medical doctors or dentists provide health care and dental care, with inpatient facilities for 20 or more patients.

Korea

Source of data: **Ministry of Health and Welfare**, Yearbook of Health and Welfare Statistics.
Coverage:
- Medical institutions equipped with at least 30 beds.

Luxembourg

Source of data: **Ministère de la Santé**, service juridique.

Mexico

Source of data:
- Since 1990 to 2006, **Ministry of Health**. Bulletin of Health Information and Statistics. National Health System, Vol. 1.
- From 2007 to 2011, **Ministry of Health**. Data are taken from the unique catalog of health establishments (Clave Unica De Establecimientos De Salud, CLUES) for public institutions.
Coverage:
- The information includes general and specialist hospitals.
- The data presented include public and private for-profit hospitals.

Netherlands

Source of data: **Statistics Netherlands**.
- 1987-2002: Survey;
- 2002-2005: **Prismant** survey;
- 2006 onwards: Annual reports social account.
Coverage: Refers to organisations, not locations.
Break in time series: Break in 2010 due to inclusion of for-profit privately owned hospitals.

New Zealand

Source of data: **Ministry of Health, HealthCert database**.
Reference period: Number of hospitals as at 31st December 2009, 2010, 2011, and 2012.
Coverage:
- Providers certified under the Health and Disability Services (Safety) Act 2001.
- Premises for those certificates with a service type of Hospital.
- Certificates with service types of Aged Care, Residential Disability or Fertility excluded.
- Includes hospitals owned by District Health Boards, hospitals with an organisation type of Trust or Incorporated Society and all other providers.

Norway

Source of data: **Statistics Norway**. Business register/Statistics on Specialist Health Services.
Annual data collection. See http://www.ssb.no/speshelse_en/.
Reference period: Annual average.
Coverage: The figures cover all hospitals (HP.1).

Poland

Source of data: **The Ministry of Health, the Ministry of National Defence and the Ministry of Interior and Administration, and the Central Statistical Office.**
Reference period: 31st December
Coverage:

- The number of hospitals comprises general hospitals (supervised by the Ministry of Health, the Ministry of National Defence and the Ministry of Interior and Administration) and psychiatric hospitals.
- 2004-2006 Health resort hospitals and health resort sanatorias are excluded because of the complex structure of the Health Resort Treatment.
- From 2007 onwards, health resort hospitals are included
- Prison hospitals are excluded.
Break in time series:
- Since 2004: Hospitals of the Ministry of National Defence and the Ministry of the Interior and Administration are included.
- Since 2007: Health resort hospitals are included.

Portugal

Source of data: **Statistics Portugal** - Hospital Survey.
Reference period: 31st December.
Coverage:
- The Hospital Survey began in 1985. This survey covers the whole range of hospitals acting in Portugal: hospitals managed by the National Health Service (public hospitals with universal access), non-public state hospitals (military and prison) and private hospitals.
- In 2012, the data series number of hospitals was redefined according to the concept of separate hospital establishments. For example, a hospital centre with three different establishment counts now as three hospitals.

Slovak Republic

Source of data: **National Health Information Center**. Annual report (MZ SR) on network of health care providers in 2005 - 2010 in SR.
Reference period: 31st December.
Coverage:
- Hospitals are counted according to the recommendations and definitions following the SHA version 1.0.
- Hospitals in the territory of the Slovak Republic (general hospitals, specialty hospitals, sanatoriums - i.e. hospitals providing long-term care for the chronically ill and hospitals providing rehabilitation and related services to physically challenged or disabled people).
Break in time series: Break in 2005 is due to change in a statistical finding in accordance with Act No 578/2004 on health care providers. Time series revised in accordance with final agreement on classification in the Slovak Republic.

Slovenia

Source of data: **The National Institute of Public Health of the Republic of Slovenia**.
Reference period: 31st December.

Spain

Source of data:
- Before 1996: **National Statistics Institute** and **Ministry of Health and Consumer Affairs**. Statistics on Health Establishments Providing Inpatient Care (available hospitals).
http://www.ine.es/jaxi/menu.do?type=pcaxis&path=/t15/p123&file=inebase&L=0.
- From 1996 to 2009: **Ministry of Health, Social Services and Equity** from **Statistics on Health Establishments Providing Inpatient Care** (ESCRI).
http://www.msssi.gob.es/estadEstudios/estadisticas/estHospiInternado/inforAnual/homeESCRI.htm
- Since 2010: **Ministry of Health, Social Services and Equity** from **Specialised Care Information System** (Sistema de Información de Atención Especializada - SIAE).
Coverage:
- All public and private hospitals in Spain are included.

Sweden

Source of data: **Federation of County Councils** (data for 1980-2003).
Coverage: There is no distinction made in Sweden between hospitals and acute care (short-stay) hospitals.
Note: From 2004 there is no information on how many hospitals there are in Sweden. There is no consistent definition of what a hospital is.

Switzerland

Source of data:
- Since 1997: **FSO Federal Statistical Office**, Neuchâtel, hospital statistics; yearly census.
- Until 1996: Data from the **Hospital Association (H+)**, Bern.
Break in time series: Hospital statistics have been revised (data year 2010); new delimitation of hospital entities and elimination of artificial double counting for some hospitals (e.g. because of multiple activity).

Turkey

Source of data:
- From 2000 onwards: **General Directorate for Health Services, Ministry of Health**.
- Up to 1999: **Health Statistics Yearbook - Ministry of Health**.
Coverage: Total number of hospitals in the MoH, universities, the private sector and others are included in the data.
- MoD not included.

United States

Source of data: **American Hospital Association** (AHA)/Annual Survey of Hospitals, Hospital Statistics (several issues)/Health Forum LLC, an affiliate of the American Hospital Association. http://www.aha.org/.
Coverage: AHA-registered hospitals in the United States. U.S. hospitals located outside the United States are excluded.
Deviation from the definition: Data match the OECD definition.
- Estimates are for all AHA registered hospitals.
- AHA-registered hospitals include facilities such as short-term general, psychiatric hospitals, wards, rehabilitation institutes, maternity homes, tuberculosis hospitals, leprosariums and alcoholic treatment institutions.
- Estimates exclude U.S. associated areas such as Puerto Rico and AHA non-registered hospitals.
Estimation method: Survey.
Break in time series: No breaks in time series.
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ANNEX III. TASK FORCE MEMBERS

Background

In January 2012, the OECD established an Expert Group and four Task Force Groups: Electronic Health Records (EHR); Health Information Exchange (HIE); Personal Health Records (PHR); and Telehealth. The Task Force Groups were charged with reviewing feedback on the proposed benchmark indicators, researching and critically assessing the appropriateness, robustness, and suitability of potential benchmarking indicator constructs, and proposing a revised set of indicators for international use. Task Force members represented a range of countries and key stakeholder audiences in order to provide input and information requirements in relation to benchmarking indicators. Each group had a task force leader as well as a coordinator.

Electronic Health Records (EHR) Benchmarking Task Force

Members

Julia Adler-Milstein,	University of Michigan School of Information,	United States
Marketa Arce,	Czech Statistical Office,	Czech Republic
Alexandre Barbosa,	Brazilian Network Information Center,	Brazil
Dustin Charles,	Office of the National Coordinator for Health IT,	United States
Cristiano Codagnone,	Milano Polytechnic University,	Italy
Päivi Hämäläinen,	National Institute for Health and Welfare,	Finland
Hannele Hyppönen,	National Institute for Health and Welfare,	Finland
Ashish Jha,	Harvard School of Public Health,	United States
Sun Min Kim,	Health Insurance Review and Assessment Service,	South Korea
Yoon Kim,	Health Insurance Review and Assessment Service,	South Korea
Michio Kimura,	Japan Association for Medical Informatics	Japan
Luc Nicolas,	FPS Health, Food Chain Safety and Environment,	Belgium
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Vaishali Patel,	Office of the National Coordinator for Health IT,	United States

Elettra Ronchi,	OECD,	France
Dominik Rozkrut,	Central Statistical Office,	Poland
Fabio Senne,	Brazilian Network Information Center,	Brazil
Noguchi Takashi,	Ministry of Health, Labour and Welfare	Japan
Laura Pannella Winn,	Harvard School of Public Health,	(OECD Consultant)

Health Information Exchange (HIE) Benchmarking Task Force

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Ashish Jha,	Harvard School of Public Health,	United States
Sun Min Kim,	Health Insurance Review and Assessment Service,	South Korea
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Elettra Ronchi,	OECD,	France
Michiel Sprenger,	National IT Institute for Healthcare,	Netherlands
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Personal Health Records (PHR) Benchmarking Task Force

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Janine Bevan,	eHealth Division, Department of Health and Ageing,	Australia
Gillian Braunold,	Health Informatics,	Israel
Ashish Jha,	Harvard School of Public Health,	United States
Rachelle Kaye,	Maccabi Healthcare Services	Israel
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Telehealth Benchmarking Task Force

Members

Janine Bevan,	eHealth Division, Department of Health and Ageing,	Australia
Claudio di Carlo,	Ministry of Economic Development,	Italy
David Glance,	UWA Centre for Software Practice,	Australia
Misha Kay,	World Health Organisation,	Switzerland
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Mark Nenadovic,	Canada Health Infoway, (Task Force Secretary),	Canada
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Angelo Rossi Mori,	Institute for Biomedical Research of the National Research Council,	Italy
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