
Scope of Policy Issues for eHealth: Results from a Structured Review

Shariq Khoja, PH.D
Hammad Durrani
Ammad Fahim

“The new information and communications technologies are among the driving forces of globalization. They are bringing people together, and bringing decision makers unprecedented new tools for development. At the same time, however, the gap between information ‘haves’ and ‘have-nots’ is widening, and there is a real danger that the world’s poor will be excluded from the emerging knowledge-based global economy.”

Speech by Kofi Annan
Former Secretary General
United Nations

Introduction

eHealth refers to the use of information and communication technologies (ICT) in health care. The World Health Organization (WHO) has defined eHealth as “the cost-effective and secure use of ICT in support of health and health-related fields, including health care services, health surveillance, health literature, and health education, knowledge and research”¹. The applications of eHealth have been further classified, such as use of eHealth in the provision of health services at a distance (telehealth), management of clinical and administrative information (health informatics), and sharing information and knowledge with health care providers, patients, and communities (e-learning).

Recognition of eHealth as an important tool by which to reduce discrimination based on lack of access to information and to provide timely response to matters impacting one’s personal or community health is growing in both developed and developing countries.² Proven benefits of eHealth include improved access to care, enhanced quality of services, and reduced costs of care for patients and health care systems. eHealth has played an important role in improving health care services in many developing and developed countries. For example,

teleconsultations using live (synchronous) and store-and-forward (asynchronous) technologies have improved access to specialized health care services in almost all clinical subspecialties. These technologies have also been used to improve access to sources of knowledge for patients, health care providers, and the general population. Advances in Electronic Health Records (EHRs), Picture Archival and Communication Systems (PACS), and Health Management Information Systems (HMIS) now provide support to health care professionals and managers to aid clinical and administrative decision-making. The use of the Internet and handheld devices has opened new avenues for health promotion and management. Many of these technologies are currently being used in developing countries all over the world. Health care providers in developing countries have thereby benefited, mainly through enhancement of workforce development and support of day-to-day activities for frontline health care providers.

However, use of eHealth within or between institutions involves a number of factors that require proper planning. Many of these issues cannot be addressed without the support of well-defined policies, rules, standards, or guidelines at the institutional, jurisdictional, and global levels. Absence of these policies may lead to several problems during the cycle of eHealth planning which may lead either to failures in achieving the intended goals or unintended widening of the gap in health status and knowledge between different sectors of the population, increasing rather than decreasing health inequity, also termed as Digital Divide.³ Experience from the developed world has also shown several impediments in the process of eHealth planning, including lack of information on the role of eHealth in the provision of health care, a lack of operational and support policies, a lack of demonstrated cost-benefit, and a lack of clinical proponents.⁴ Thus it is important for the planners of eHealth at different levels to develop policies that could facilitate the adoption of eHealth and prove its success through improvement in services and change in health status of the population.

Realizing the importance of identifying and understanding the need for eHealth policies, the World Health Organization has planned a meeting of eHealth policy experts in Bellagio, Italy, on August 4-8, 2008. To facilitate the discussions, it has been decided to produce three working papers that capture the scope of policy issues, existence of different policies, and their analysis. The current report gives a detailed overview of the existing policy issues faced at different levels for developing a successful eHealth implementation.

Objectives

The objectives of this report were to determine the scope of issues that are faced by individuals, institutions, or governments at different levels in order to implement successful eHealth programs.

Process of Collecting Information

A structured search of peer-reviewed and grey literature was conducted by a group of researchers at the Aga Khan University, Karachi. The following process was adopted to collect the relevant information:

a. For peer-reviewed literature:

Efforts were made to collect and review as many journal articles as possible in the given time frame. A search was conducted by a research assistant on PubMed, using the Medline database, for the keywords, such as eHealth, telehealth, telemedicine, health informatics, electronic health records, health telematics, guidelines, policies, rules, and plans. Only the articles in the English language were chosen, that were published in any journal during the past ten years (1998-2008). The review was conducted in the following stages:

- i. Review of 150 abstracts by two researchers to select the articles that were relevant and merit full-paper review.
- ii. Review of 40 full papers that focused on different aspects of eHealth policy, or highlighted policy issues in eHealth implementation.

b. For grey or non-peer-reviewed literature:

About 20 national and international-level policy papers and documents were extracted through a Google search. These articles were reviewed by two researchers to extract policy issues and solutions described at different levels of care.

Both of the reviewers developed their own lists of policy issues, which were then reviewed to exclude duplications and to categorize the issues into groups for better understanding. The issues were grouped into categories and themes that are described in the following section.

Key Findings

A large number of eHealth-related issues were extracted from the literature. These issues are grouped under nine themes and 21 categories on the basis of similarities in their focus. The following are the themes identified for eHealth policies:

- Networked care
- Interjurisdictional practice
- Diffusion of eHealth / addressing digital divide
- Integration into existing systems
- Handling innovation at different levels Policy goal-setting
- Evaluation and research
- Investment
- Ethical issues.

A. **Networked care:**⁵⁻⁹ This theme includes policy categories and issues that can enhance the ability of providers, departments, organizations, and jurisdictions to work in a coordinated environment to improve care of the population. The issues covered under this theme are grouped under the following five categories:

1. Creating an enabling environment
2. Sharing of information, knowledge, and practice
3. Making the transfer of information easier
4. Making the transfer of information safer
5. Challenges for networked care.

1. Creating an enabling environment: This category includes policy issues related to creating enabling environment for smooth adoption of eHealth solutions. The following issues related to this category were identified in the literature:

- a. Commitment of funds by the organizations and government^{10, 11}: the literature suggests that high-level decisions showing commitment of institutions and governments to fund eHealth programs is essential for acquiring commitment from other stakeholders for eHealth.
- b. Readiness-building and effective change management:¹⁰⁻¹³ The papers suggest that it is important for organizational leadership to recognize the importance

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- of building individual and collective readiness, and there is also emphasis on effective change management for the implementation of eHealth solutions.
- c. Deployment of appropriate technologies: There should be clear policies from the leadership to acquire technologies that are acceptable, user-friendly, affordable, and reliable in any given circumstances.
 - d. Proper distribution of human resources¹⁴: It is important for leadership to define clear policies on how the workload will be distributed, especially in the pre-integration phase. Health care professionals and the support staff allotted for eHealth programs should have clear guidelines and policies to undertake the special assignments.
 - e. Reimbursement^{15, 16}/ remuneration: ^{6, 16-18} Clarification of reimbursement policies for the specialists, and remuneration for all health care staff for eHealth activities is essential for their buy-in for eHealth activities.
 - f. Meeting the needs of insurance companies:¹⁹ It is important to define payment policies for the public or private insurances when eHealth is being used for patient care. These policies will help the clients, providers, management, and the payers to make a smooth transition towards eHealth.

2. Sharing of information, knowledge and practice. This category includes policy issues related to the process of sharing information, knowledge, and practices between organizations.

- a. Sharing of patient information:⁶ Policies related to the content and authorizations for sharing patient information between providers, departments, and institutions are necessary to facilitate networked care. Such policies include creation of unique identifiers for patients.¹⁹ These policies are also necessary to ensure that the patient information is comprehensive, comprehensible, and transferable.²⁰
- b. Sharing of knowledge:⁶ Clear policies on sharing of teaching material, literature, and other sources of tacit and explicit knowledge are important to determine what kind of networking will be developed among the providers.
- c. Sharing of services, e.g., consultations, pharmacy, etc.:²¹ Clear policies on the type and processes for sharing of

services between the institutions and jurisdictions should be developed.

3. Making transfer of information easier. This category includes policy issues that enable smooth transfer of information from one provider to the other or from one institution to the other. The issues included in this category are as follows:

- a. Functional interoperability:^{18, 19} Policies are essential to guide the purchase or development of hardware and software that could enable the transfer of information between different partners.
- b. Semantic interoperability:¹⁹ It is important that the information transferred between providers or organizations is interpreted the same way as it was intended. Policies to guide the use of terminologies, composition and coding of information, and building capacities should be clearly defined.
- c. Standardization measures for HER (19): It is important for the organizations to ensure that their EHR follows some set of standards. This is necessary for the transferability of information and interoperability of systems.

4. Making the transfer of information safer. This category includes policy issues related to transfer of information in a secure and integrated form. The issues included in this category are as follows:

- a. Security of information during portability:²² Policies are important for proper coding of patient information and removal of identifiers that could affect patient privacy during the transfer of information from one source to the other. It is also important to set policies for authorizing only the relevant people to access patient information.
- b. Ensuring integrity and quality of data / information:^{19, 23} It is also important to design clear policies to ensure that the quality of information is not compromised to the level that it risks the provision of safe care to the patient.
- c. Health information privacy:²⁴ Clear policies on the privacy and confidentiality are necessary for the transfer of information between providers and institutions.
- d. Policies on managing health information on the Internet:^{25, 26} Institutions and governments should ensure that the information provided or downloaded

from the Internet is safe for the health of the population. Policies for Internet safety are essential in most circumstances.

5. Challenges for networked care. This category includes various challenges that can be faced during the provision of networked care. These include:

- a. Accountability/liability of care:^{6, 10, 18} Policies should be designed to clarify how the issues of accountability and liability will be handled, in case of any untoward incident.
- b. Confidentiality/privacy:¹⁰ Clear policies to ensure confidentiality and privacy of patient information are necessary to avoid any conflicts and ethical issues. Authorization to access patient information should be properly structured.
- c. Ensuring proper connectivity:¹⁸ Policies regarding uninterrupted connectivity with appropriate bandwidth are necessary to ensure that the networked services run smoothly between the sites. Backup plans should also be planned for.
- d. Controlling malpractice:^{10, 15} It is important to design stringent policies to ensure that malpractice, such as access to patient information or breach in the privacy or quality of care, is controlled.
- e. Intellectual property rights:¹⁰ In case of research or collective learning, it is important to develop policies that provide guidance regarding who should have the property rights on material produced as a result of networked services.
- f. Risk management:¹⁰ Policies to ensure risk management related to issues with interoperability and liability should be covered. There should be well-defined backup plans if any such issues occur during the networked services.
- g. Cultural issues in communication:¹⁰ It is important to have policies that deal with cultural sensitivities in provision of care through eHealth.

B. Interjurisdictional Practice.⁶ This theme includes policy categories and issues that deal with the transfer of information and provision of care between different jurisdictions. The issues covered under this theme are grouped under the following two categories:

1. Professional portability
2. Challenges in interjurisdictional practice.

1. Professional portability. This category deals with the issues related to the ability of health care providers to provide care to patients or give advice to physicians in jurisdictions other than where they are currently licensed. These issues include:

- a. Licensing:^{6, 18, 27} This issue deals with the restrictions from licensing authorities to practice medicine and nursing in different jurisdictions.
- b. Accreditation of services: This issue deals with the lack of recognition of some institutions in their own or other jurisdictions. This may cause inability of their providers to be part of any eHealth activity.

2. Challenges in interjurisdictional practice. This category includes policy issues that can pose challenge to the implementation of interjurisdictional eHealth. The following issues are included in this category:

- a. Local, national, and international policies:⁶ It is important for eHealth policies developed by any organization or jurisdiction to complement similar policies in other institutions and jurisdictions to enable coordinated care.
- b. Different health care regulations in different regions:^{19, 24} Different regulations in different regions related to issues such as privacy, confidentiality, and reimbursement may also hinder their ability to participate in coordinated care and transfer and store patient information.

C. Diffusion of eHealth^{28, 29}/**addressing digital divide**^{6, 30, 31}. This theme includes policy categories and issues that enhance the use of eHealth among the neediest populations to improve health services. The issues covered under this theme are grouped under the following two categories:

1. Increasing penetration of services
2. Developing "Open" policies

1. Increasing penetration of services. This category consists of policy issues that can increase the ability of technologies to reach poor, remote and most vulnerable population groups. These issues are discussed as follows:

- a. Telecommunication policies allowing increased access:^{6, 19} Governments should develop policies to allow greater penetration of telecommunication

- companies, such as mobile companies, ISPs, ISDN service providers, and satellite vendors to reach the remotest regions of their countries. This will help promote eHealth in such areas.
- b. Controlling cost of technology:²⁴ Governments should also develop policies to reduce the cost of telecommunication, so that it is affordable by all groups of the population, especially the poor and most vulnerable. Special packages for use of telecommunication in the social sector could also enhance its use for eHealth.
 - c. Providing universal and unlimited access to the Internet:³² Governments should develop policies to provide universal and unlimited access to the Internet to their populations, so that the power of the Internet can be used for development. eHealth will also become part of that overall development. The governments should also make efforts to reduce costs and increase bandwidth of the Internet available for social sector.
 - d. Capacity building:³³ Access to eHealth in remote areas can also be increased by building capacity of the local users and general population. It is important that the institutions and governments introduce programs of learning on a regular basis to increase awareness and comfort levels of their providers, management and clients.

2. Developing “Open” policies. This category includes policy issues that can make eHealth available for poor and remote groups of populations. The issues include:

- a. Open and facilitated exchange and sharing of skills and knowledge:⁶ Institutions and the governments should introduce policies to encourage their health care providers and other user groups to freely exchange their knowledge and knowledge to benefit others.
- b. Increasing focus on open-source technologies: Since many open-source technologies are now considered fairly stable, the institutions and governments should introduce policies for their decision-makers to consider open-source eHealth software as an option.
- c. Humanitarian commercial policies:³⁴ Use of eHealth has a strong commercial component, which many institutions may benefit from. In order to address the

digital divide, it is important for the institutions and governments to strongly promote use of eHealth for humanitarian purposes as well. Such policies will encourage NGOs and other social organizations to provide benefits to the population through these technologies.

D. Integration into existing systems.^{6, 28} This theme includes policy categories and issues that enable integration of eHealth projects and programs with the regular services. The issues covered under this theme are grouped under the following four categories:

1. Achieving broader goals through integration
2. Facilitating integration
3. Identifying and involving the stakeholders
4. Challenges with integration

1. Achieving broader goals through Integration. This category includes policy issues that should be included as part of the government’s or institution’s vision to benefit most from eHealth technologies. These policies include:

- a. Improving clinical effectiveness:²⁸ The institutions and governments should have a target to improve effectiveness of their care by increasing interaction between different groups of providers and users. Introducing appropriate decision support systems would also help in reducing errors and enhancing effectiveness of care.
- b. Improving quality of care: There should also be a strong commitment from the governments and institutions to improve the quality of care for their clients. The delivery of health care facilitated by eHealth should not compromise on quality of care. They should also be looking to create a learning environment for individuals to provide the best possible care to the clients.
- c. Increasing access to services: There should be a strong commitment to improve access of populations living in rural and remote areas to better care and services. This commitment can be a driving force for the entire eHealth program in any given population.
- d. Reducing cost of care: Governments and institutions should also have a strong focus on reducing cost of care, especially for their clients. This can be effectively achieved by using eHealth to connect various resources and experts,

and thus provide a continuum of care for the populations.

2. Facilitating integration. This category includes policy issues that may facilitate integration of eHealth services in the routine services provided by individuals or health care institutions. These issues include:

- a. Defining the scope of eHealth services:^{10, 35-37} Early identification of the range of services that would use eHealth, such as administrative, research and clinical tasks, or monitoring, can help in better planning of eHealth programs. Such decision-making would include the appropriate hardware, software, connectivity and human resources necessary to make the programs successful.
- b. Proper deployment of resources:²⁸ It is important for the organizations and governments to plan their resources, both material and human, before the start of integration of eHealth into routine services. A strong individual/government/organizational ownership is necessary for a successful and sustainable integration.
- c. Change in business rules in organizations and insurance companies:³² An explicit and in-depth understanding of changes in the business model of the organizations is necessary for successful integration of eHealth technologies. Special focus is required to define simple and workable processes for the insurance companies and corporate payers.

3. Identifying and involving the stakeholders. This category includes policy issues that deal with identification and inclusion of different groups of stakeholders into the planning and implementation of eHealth. These issues include:

- a. Who are the stakeholders at different levels:²³ It is important for the institutions and governments to define clear policies to identify and include stakeholders from different user and support groups in the planning of eHealth programs.
- b. What are the roles and responsibilities of different players, such as local providers, specialists etc.:²³ It is also important to develop clear guidelines on the roles and responsibilities of different users in the provision of care, using eHealth. Such guidelines will reduce confusion and enhance commitment

from different players in ensuring the success of eHealth programs.

4. Challenges with integration. This category includes policy issues that may pose challenges for the integration of eHealth services. These issues include:

- a. Increasing acceptability among patients and providers:²⁸ Acceptance of eHealth among patients and providers is necessary for its sustained implementation. There is a need to introduce policies to enhance awareness and comfort levels among health care providers and clients.
- b. Wider ethical acceptability:^{28,38} Integration of eHealth with routine services also depends on defining explicit policies on various ethical issues, such as use among different gender and sociocultural groups, transfer and storage of information, consent from the patients, confidentiality and privacy, etc.
- c. Coordination among different health care delivery models:³⁹ Several health care delivery models exist in health care institutions within and across jurisdictions. Some of these models may not have enough flexibility to incorporate eHealth into the existing services. Clear policy guidelines are required to practice eHealth with various delivery models, without interruption of services.
- d. Effects on human resources (recruitment and retention): Use of eHealth may bring changes in the work patterns of several staff members, and may also lead to changes in the way staff is recruited, trained, and retained in any organization. Introduction of policies to guide the employees, their supervisors, and Human Resources departments could facilitate the integration of eHealth services with routine care.

E. Handling innovation at different levels(28).

This theme includes policy categories and issues that can enhance the capability of institutions to implement eHealth successfully. The issues covered under this theme are grouped under the following three categories:

1. Assigning definite roles
2. Managing change brought by new technologies and ideas
3. Assessing technologies

1. Assigning definite roles. This category includes policy issues that define the roles of different players in introducing new and innovative technologies in health care. These include:

- a. Who is responsible for Change:²⁸ It is important for the institution implementing eHealth to identify group of people who can lead the process of change. It is important to involve highest level of management, along with health care providers and IT to lead this process.
- b. Who handles the problems:²⁸ Clear policies should also be in place regarding who will support the technical change in the institutions. It is usually better, at least initially, to assign special tasks to a few IT people to support eHealth activities. This may reduce delays in acquiring help for such programs.
- c. Regulating IT use:¹⁹ With the introduction of eHealth at the institutional and jurisdictional levels, it may become necessary to regulate the way IT systems are run in those areas. Rules should be defined on the procurement of equipment, distribution of bandwidth, training of users, etc.

2. Managing change brought by new technologies and ideas. This category includes policy issues related to the smooth transition of institutions with the introduction of technology. These issues include:

- a. Bringing changes in infrastructure (local level²⁸, broader level:²¹ Infrastructure changes to allow easier access to computers, Internet, and other necessary information are necessary for smooth transition for eHealth. Institutions should develop clear policies and guidelines for this change.
- b. Handling increasing communication costs:²⁸ Institutions should have policies to handle the initial rise in communication costs due to the introduction of eHealth programs. These costs may later be justified against the reduction in other costs or benefits gained as a result of that investment.
- c. Change management: It is important for the institutions to have clear policies to manage change at all levels for a smooth transition with eHealth. Special teams should be assigned to conduct proper assessment of readiness and then make plans to manage the change

smoothly by enhancing readiness in the organizations.

- d. Maintaining doctor-patient relationship:⁴⁰ There is usually a fear in health care organizations that eHealth would replace health care providers, or would negatively impact the relationship between providers and patients. Policies ensuring this relationship are extremely important.

3. Assessing technologies. This category includes policy issues to ensure that the technology that is acquired for eHealth programs is appropriate and acceptable to the users. These issues include:

- a. Wireless networks and security issues:⁴¹ It is important for institutions and governments to assess the new technologies and the opportunities and risks associated with these technologies. Wireless technology is one example, which is spreading extremely fast worldwide. It is important that the policies are introduced to have in-depth assessment of what the technologies have to offer.
- b. Evaluation of new technologies in local environments:²⁸ It is also important to have guidelines on evaluating technologies in a given environment before implementing them at a larger level.

F. Policy goal setting.³⁵ This theme includes policy categories and issues that can guide the institutions in defining policies for eHealth. The issues covered under this theme are grouped under the following four categories:

1. Making eHealth possible/feasible
2. Making policies flexible
3. Providing effective governance
4. Guidelines for different stakeholders

1. Making eHealth possible/feasible. This category includes areas of policy development that could enhance the profile of eHealth, and enable institutions to get better benefits from these innovations. These include:

- a. Making eHealth part of the overall development effort:⁴² It is important for the governments to make eHealth part of their broader development efforts, rather than keeping it as a special project or program.
- b. Funding of eHealth programs:⁴³ It is important that the governments commit

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- to funding eHealth programs at least to the stage when they can be fully integrated with the other health services.
- c. Providing suitable telecommunication infrastructure to promote eHealth:⁴³ Governments should either invest in or develop policies to encourage growth of the telecommunication sector in the country. This will increase connectivity in different areas, and will enhance the chances of implementing successful eHealth programs.

2. Making policies flexible. This category includes certain characteristics of policy that would give it the flexibility to manage change and bring sustainable change. These characteristics include:

- a. Aligning policies with IT innovations:¹⁹ The governments and institutions should have the flexibility to modify or align their policies to accommodate the fast changing IT environment, and to benefit from the new developments in this field.
- b. Innovative and forward-looking policies:⁴⁰ The policies introduced by the governments and the institutions should be forward-looking to proactively attract innovations and new thoughts to be used for the improvement of health services.
- c. Covering for the opportunity cost of physicians, especially during the initial phase when volumes are low:⁴² The institutional policies should allow for the initial support required to successfully implement eHealth projects, especially during the period of change management. This would include covering cost of equipment and the time needed from the health care providers until the services are widely accepted.
- d. Timing of government action; making policies at the right time:⁴³ It is important that the governments realize the importance of setting direction and implementing policies at the beginning of eHealth planning rather than too late in the process. In other words, the policies need to be proactive rather than reactive.

3. Providing effective governance. This category includes areas of policy development that provision of good governance for the eHealth programs. These include:

- a. Developing leadership structures for eHealth programs: Every institution

should develop a high-level team that could take the responsibility of planning and implementing eHealth programs in the institutions.

- b. Developing strategies for eHealth adoption: It is important for the governments and institutions to develop their eHealth visions and strategies, which are made public so that the stakeholders are well aware of the objectives of the eHealth programs.
- c. Information governance:^{43, 44} To implement successful eHealth programs, it is important to develop structures that could ensure the privacy, security, completeness and integrity of the information that is transferred between institutions during the eHealth programs.

4. Guidelines for different stakeholders.^{45, 46} This category includes policy issues that prepare different stakeholders for successful eHealth adoption. Following are the issues covered under this category:

- a. Guidelines for organizational leadership:⁴⁵ It is important for the institutions to develop guidelines for their leadership for developing, planning and implementing eHealth programs.
- b. Guidelines for technology and equipment:⁴⁵ Guidelines for procurement, maintenance and support in using the technologies are essential for planning successful eHealth programs.
- c. Guidelines for clinical standards and outcomes:⁴⁵ Guidelines on maintaining standards of care during eHealth services, and ensuring that these services bring maximum benefit to the population, are essential for eHealth services.
- d. Guidelines for human resources:⁴⁵ Guidelines for allotment and distribution of workload for health care providers, technical and managerial staff are necessary for sustained use of eHealth in any environment. Policies are also required for the recruitment and retention of such manpower.

G. Evaluation and research:³⁵ This theme includes policy categories and issues that can guide the process of evaluation and research to generate evidence for adoption of eHealth. The issues covered under this theme are grouped under the following two categories:

1. Evaluating the impact of eHealth
2. Assessing new technologies

1. Evaluating the impact eHealth. This category includes policies regarding measurement of various impacts of eHealth in different environments: These include:

- a. Time spent with patients and its relationship with cost:⁴⁷ It is important to plan and measure the time spent between providers and patients, and how it could be justified against the resources spent for setting eHealth services.
- b. Cost-effectiveness:⁴⁸ It is important to ensure that the eHealth services stay cost-effective, and do not put unnecessary burden on the budgets of the institutions and the governments. Clear policies in this regard should be developed.
- c. Impact of eHealth on health care management (48): Clear guidelines should be developed to measure and enhance the impact of eHealth on improving the management of health care programs and institutions.
- d. Demonstrate health outcomes:⁴⁹ It is also important for the governments and institutions to measure the impact of eHealth on health outcomes in the communities, and to ensure that the health status of the population improves with these programs.
- e. Evidence on clinical effectiveness:⁴⁰ Effectiveness of health care and services should be enhance through eHealth, and policies/protocols should be designed to appropriately measure these changes.
- f. Progress in learning:² eHealth should also improve the learning environment of health care institutions, and should directly benefit health care providers.

2. Assessing new technologies. This category includes areas of technology assessment that may require support from policies. These include:

- a. Providing simulation environment:⁴¹ Policies that could encourage the testing of eHealth solutions, especially in the simulation environments, should be encouraged. Such testing would provide confidence to the planners and users before taking the technology to the actual environments.
- b. Encouraging coordinated research:⁵⁰ Since eHealth is an interdisciplinary

field, it is important to allow experts from different fields to participate in evaluating the technologies. Such research would help in building evidence that is generalizable to other situations.

- c. Dissemination for policy making and the benefit of others:² Policies need to be defined to encourage the researchers and managers to generate reliable evidence that is disseminated for use by the policymakers at the institutional and government levels. Such dissemination would also benefit other users of eHealth.

H. Investment.⁷ This theme includes policy issues that can suggest business models for eHealth adoption. Following are the issues covered under this theme:

- a. Use of eHealth for commercialization purposes:¹⁰ It is a natural phenomenon that many institutions will use eHealth to increase their clientele and thus grow their businesses. Proper policies are needed to regulate these efforts so that the element of care and benefit to the population are not lost.
- b. Public-private partnership: Realizing the kind of investments required in implementing eHealth programs, it may be useful to explore public-private partnership models for eHealth. Clear policies and guidelines to implement such partnerships would be beneficial.
- c. Cross-border advertisement and sale of drugs: Use of eHealth has encouraged interjurisdictional provision of care, including the order and sale of medicines. It is necessary for the governments to design policies that could regulate and guide the use of eHealth for such purposes, and control malpractice and fraud.

I. Ethical issues.²⁵ This theme includes ethical issues that may hinder the adoption of eHealth. Following are the issues covered under this theme:

- a. Consent for care in eHealth:^{22, 23} Laws differ in many areas on obtaining consent for care before transferring patient information online, or before arranging video-conferencing sessions. Clear policies to guide such consent can benefit health care institutions and providers.
- b. Liability issues (medical malpractice liability):^{22, 48, 51} Policies regarding

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- liability issues are extremely important, especially in the cases of interjurisdictional care.
- c. Medico-legal issues:⁴⁸ Policies regarding medico-legal issues in eHealth are also crucial, and must be developed before such programs are implemented.
 - d. Patient's right to access information:¹⁰ Policies regarding a patient's right to access his or her own information is an important matter for eHealth decisionmakers. Clear policies in this regard would help the managers and providers to share the requested information with the patients.

Table 1 provides a list of policy issues grouped into categories and themes:

	Themes	Policy Categories	Issues
A.	Networked care	1. Creating enabling environment	Commitment of funds by the organizations and governments
			Readiness building and effective change management
			Deployment of appropriate technologies
			Proper distribution of human resources
			Reimbursement/remuneration
			Meeting the needs of insurance companies
		2. Sharing of information, knowledge and practice	Sharing of patient information
			Sharing of knowledge
			Sharing of services, e.g., consultations, pharmacy etc.
		3. Making transfer of information easier	Functional interoperability
			Semantic interoperability
			Standardization measures for EHRs
		4. Making transfer of information safer	Security of information during portability
			Ensuring integrity and quality of data/Information
			Health information privacy
			Policies on managing health information on the Internet
		5. Making transfer of information safer	Security of information during portability
			Ensuring integrity and quality of data/Information
			Health information privacy
			Policies on managing health information on the Internet

		6. Making transfer of information safer	Security of information during portability
			Ensuring integrity and quality of data/Information
			Health information privacy
			Policies on managing health information on the Internet
		7. Challenges for networked care	Accountability/liability of care
			Confidentiality/privacy
			Ensuring proper connectivity
			Controlling malpractice
			Intellectual property rights
			Risk management
		Cultural issues in communication	
B.	Interjurisdictional practice	1. Professional portability	Licensing
			Accreditation of services
		2. Challenges in interjurisdictional practice	Local, national and international policies
			Different health care regulations in different regions
C.	Diffusion of eHealth/addressing digital divide	1. Increasing penetration of services	Telecommunication policies allowing increased access
			Controlling cost of technology
			Providing universal and unlimited access to Internet
			Capacity building
		2. Developing "Open" policies	Open and facilitated exchange and sharing of skills and knowledge
			Increasing focus on open-source technologies
			Humanitarian versus commercial policies
D.	Integration into existing systems	1. Achieving broader goals through integration	Improving clinical effectiveness
			Improving quality of care
			Increasing access to services
			Reducing cost of care
		2. Facilitating integration	Defining scope of eHealth services
			Proper deployment of resources
			Change in business rules in organizations and insurance companies

		3. Identifying and involving the stakeholders	Who are the stakeholders at different levels What are the roles and responsibilities of different players
		4. Challenges with integration	Increasing acceptability among patients and providers Wider ethical acceptability Coordination among different health care delivery models Effects on human resources (recruitment and retention)
E.	Handling innovation at different levels	1. Assigning definite roles	Who is responsible for change Who handles the problems Regulating IT use
		2. Managing change brought by new technologies and ideas	Bringing changes in infrastructure Handling increasing communication costs Change management Maintaining doctor-patient relationship
		3. Assessing technologies	Wireless networks and security issues Evaluation of new technologies in local environments
F.	Policy goal-setting	1. Making eHealth possible/feasible	Making eHealth part of the overall development effort Funding of eHealth programs Providing suitable telecommunication infrastructure to promote eHealth
		2. Making policies flexible	Aligning policies with IT innovations Innovative and forward-looking policies Covering for the opportunity cost of physicians, especially during the initial phase when volumes are low Timing of government action
		3. Providing effective governance	Developing leadership structures for eHealth programs Developing strategies for eHealth adoption Information governance

		4. Guidelines for different stakeholders	Guidelines for organizational leadership
			Guidelines for technology and equipment
			Guidelines for clinical standards and outcomes
			Guidelines for human resources
G.	Evaluation and research	1. Evaluating the impact brought by eHealth	Time spent with patients and its relationship with cost
			Cost-effectiveness
			Impact of eHealth on health care management
			Demonstrate health outcomes
			Evidence on clinical effectiveness
			Progress in learning
		2. Assessing new technologies	Providing simulation environment
			Encouraging coordinated research
			Dissemination for policymaking and benefit of others
H.	Investment		Use of eHealth for commercialization purposes
			Public-private partnership
			Cross-border advertisement and sale of drugs
I.	Ethical issues		Consent for care in eHealth
			Liability issues (medical malpractice liability)
			Medico-legal issues
			Patient's right to access information

Analysis of Key Findings

An attempt was made to develop a matrix containing stages of eHealth planning and the levels of eHealth policy. Each of the issues described above was placed in the matrix on the basis of where in the planning process it would be most applicable, and what level or levels of policy are required.

The following stages were considered for the eHealth planning process:

3. Pre eHealth: This is the stage when either no eHealth programs have been implemented or a new eHealth program is yet to be initiated. At this stage,

needs and readiness assessments are conducted at the institutions.

4. Piloting/Testing: This is the stage where the eHealth solution is piloted at a small scale to see if technology, processes and human resources can be used effectively to achieve the desired results.
5. Evaluation and Planning: This is the stage when the pilots are evaluated and the results shared to plan for the larger scale rollout in one or more institutions.
6. Implementation: This stage represents the full-scale implementation of eHealth as a project or program in one or more institutions.
7. Integration: In this stage, eHealth is merged with the regular services to

-
- make it part of the regular services and development, rather than having it as a separate project.
8. Sustained Healthcare: This stage represents complete acceptance of eHealth as part of routine and sustained health care activities.

The following levels of eHealth policy were used for the matrix:

1. Organizational/Local: This is the level where policies are required to manage eHealth programs within a single institution or multiple institutions within the same jurisdiction.
2. Jurisdictional/Regional: This is the level where policies are made to guide eHealth initiatives between two or more jurisdictions, or at a regional level including multiple jurisdictions.
3. Global: This is the level where policies and guidelines are made to guide eHealth activities involving various regions or at a truly global level.

Separate matrices for each theme described in the previous section can be found in Appendix A.

Conclusion

This policy paper provides a spectrum of eHealth issues that requires policies at different stages of eHealth planning process, and from different levels of decision makers. It is important for the policymakers to understand the importance of these issues, and take a proactive approach to develop policies that allow for smooth and reliable planning of eHealth programs. In fact, many strategies suggest that development of supportive policies should be part of the eHealth strategies of the countries and the organizations. It is therefore important to increase awareness of health care providers and managers on eHealth policy issues and provide them guidelines and support to develop these policies.

Next Steps

As a follow up to this study, an environmental scan should be conducted to identify and study the already existing policies on the issues identified in this report. There is a need to study the successes and failures of these policies, which will support the development of guidelines for policy makers at the global, regional, national and local levels to create policies that not only benefit their own eHealth programs, but also generate knowledge to support programs in other areas.

Appendix A

1. Matrix describing the position of policy issues discussed under the theme of 'Networked Care':

	Stages of eHealth Planning						
	Pre-eHealth	Piloting/Testing	Evaluation & Planning	Implementation	Integration	Sustained Health	
Organizational/ Local	Commitment of funds by the organizations and government						
	Readiness and Effective Change Management						
	Deployment of appropriate technologies						
	Proper distribution of human resources (support/training)						
	Standardization measures for EHR						
	Functional and Semantic Interoperability						
	Jurisdictional/ Regional	Security of information during portability					
		Integrity and Quality of data/information during transfer					
		Health Information Privacy/Confidentiality. Authorization to access					
		Sharing of services, such as consultation, pharmacy					
Remuneration/Reimbursement							
Global	Sharing of patient information and knowledge						
	Ensuring proper connectivity						
	Accountability/Liability						
	Controlling malpractice						
	Risk management						
	Intellectual property rights						
	Dealing with cultural issues in communication						
	Policies on managing health information on the Internet						

2. Matrix describing the positions of policy issues discussed under the theme 'Inter jurisdictional eHealth':

	Stages of eHealth Planning					
	Pre-eHealth	Piloting/Testing	Evaluation & Planning	Implementation	Integration	Sustained Health
Organizational/ Local		Accreditation of services				
Jurisdictional/ Regional	Local, national and international rules					
	Different health care regulations in different regions such as confidentiality,					
Global	Differences in legislation, such as privacy					
		Licensing				

3. Matrix describing the position of policy issues discussed under the theme of 'Diffusion Care/Addressing Digital Divide':

		Stages of eHealth Planning					
		Pre-eHealth	Piloting/Testing	Evaluation & Planning	Implementation	Integration	Sustained Health
Organizational/ Local	Increasing focus on open-source technologies						
	Open and facilitated exchange and sharing of skills and knowledge						
	Capacity Building						
Jurisdictional/ Regional	Humanitarian vs. Commercial policies						
	Controlling cost of technology						
Global	Telecommunication policies allowing increased access						
	Providing universal and unlimited access to Internet						

4. Matrix describing the position of policy issues discussed under the theme 'Integration into Existing systems':

	Stages of eHealth Planning					
	Pre-eHealth	Piloting/Testing	Evaluation & Planning	Implementation	Integration	Sustained Health
Organizational/ Local	Improving clinical effectiveness					
	Improving quality of care					
	Improving access to service					
	Reducing cost of care					
Jurisdictional/ Regional	Proper deployment of resources					
	Change in business rules in organizations and insurance companies					
	Defining scope of eHealth services: Administrative, research and clinical tasks,					
Global	Who are the stakeholders at different levels					
	What are the roles and responsibilities of different players, such as local provider, specialists, etc.					
	Increasing acceptability among patients and providers					
	Effects on human resources (recruitment & retention)					
	Coordination among different health care delivery models					
Wider Ethical acceptability						

5. Matrix describing the position of policy issues discussed under the theme of 'Handling innovations at different levels':

	Stages of eHealth Planning					
	Pre-eHealth	Piloting / Testing	Evaluation & Planning	Implementation	Integration	Sustained Health
Organizational/ Local			Who is responsible for change			
			Who handles the problems during change?			
Jurisdictional/ Regional			Bringing changes in infrastructure			
			Changes in work loads and work patterns			
			Change management			
Global			Evaluation of new technologies in local environments			
	Maintaining doctor-patient relationship					
			Regulating IT use			
			Assessing new technologies, such as Wireless networks and security			
	Handling increasing communication costs					

6. Matrix describing the position of policy issues discussed under the theme 'Making Policy Goals':

	Stages of eHealth Planning					
	Pre-eHealth	Piloting / Testing	Evaluation & Planning	Implementation	Integration	Sustained Health
Organizational/ Local			Making patient information comprehensive,			
		Guidelines for organizational leadership, human resources, technologies, and standards and outcomes				
Jurisdictional/ Regional			Covering for the opportunity cost of physicians, especially during the initial phase when volumes are low			
	Providing suitable telecommunication infrastructure to promote eHealth					
		Funding of eHealth programs				
			Information governance			
			Aligning policies with IT innovations			
Global			Innovative and forward-looking policies			
	Developing leadership structures for eHealth programs					
	Developing strategies for eHealth adoption					
		Making eHealth part of the overall development				
	Timing of government action-making policies at the right time					

7. Matrix describing the position of policy issues discussed under the theme 'Evaluation and Research':

	Stages of eHealth Planning					
	Pre-eHealth	Piloting / Testing	Evaluation & Planning	Implementation	Integration	Sustained Health
Organizational/ Local				Impact of eHealth on health care management		
				Cost-effectiveness		
				Time spent with patient and its relationship with the cost		
Jurisdictional/ Regional				Developing objective evaluation program		
				Demonstrate health outcomes		
				Evidence on clinical effectiveness and cost		
				Progress in learning		
Global			Providing simulation environment			
			Encouraging coordinated research			
				Legal and regulatory issues		
				Dissemination for policy making and benefit of others		

8. Matrix describing the position of policy issues discussed under the theme 'Investment':

	Stages of eHealth Planning					
	Pre-eHealth	Piloting / Testing	Evaluation & Planning	Implementation	Integration	Sustained Health
Organizational/ Local				Use of eHealth for commercial purposes		
Jurisdictional/ Regional		Multi-sectoral collaboration for eHealth advancement				
Global			Public-Private Partnership			
	Cross-border advertisement and sale of drugs					

9. Matrix describing the position of policy issues discussed under the theme 'Ethical issues':

	Stages of eHealth Planning					
	Pre-eHealth	Piloting / Testing	Evaluation & Planning	Implementation	Integration	Sustained Health
Organizational/ Local						
Jurisdictional/ Regional		Consent for care in eHealth				
Global			Humanitarian vs. Commercial policies			
	Patient's right to access information					
			Liability issues (Medical Malpractice liability)			
		Medico-legal issues				

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