

## Challenges and Hurdles of eHealth Implementation in Developing Countries

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### Abstract

*Health informatics has the potential to improve the security and quality of patient care, but its impact has varied between developed and developing countries. Related to this, the objective of this study is to identify the challenges and hurdles to improve eHealth in developing countries. We surveyed experts to discover their opinions about five general questions: economic support by Government for eHealth, Government education or training projects in the field, issues related to cultural or educational problems for the implementation of eHealth, policies in terminology or messaging standards and eHealth status policies for long periods. The respondents answered affirmatively in these proportions: 1. Economic support policies 58%, 2. Training policies 25%, 3. Cultural and educational problems 95%, 4. Standards policies, 38%, 5. Policies for long periods, 50% Conclusion: Our survey has shown that the important problems that need to be addressed in order to implement e-Health in developing countries are firstly, cultural and educational, secondly, economic resources and thirdly policies for long periods.*

### Keywords:

Computer system; eHealth; Medical Informatics; Cultural; Educational.

### Introduction

eHealth is the transfer of health resources and health care by electronic means. It involves three main parts: the delivery of health information, for health professionals and health consumers, through the Internet or telecommunications. It is using the power of Information Technology (IT) and e-commerce to improve public health services, e.g. through the education and training of health workers [1].

eHealth has a great importance in the management of health care services. There is no doubt about the advantages of information technology applied to health [2], but in most developing countries there are serious barriers to its effective implementation [3]. Information technology may allow significant improvements across various aspects and has the potential to benefit both developed and developing countries. The World Health Organization (WHO) identified the use of eHealth as a priority skill in the development of human resources in health (human resources in eHealth requires people with knowledge in medical informatic and standard terminology (e.g., ICD-10, SNOMED and HL7 messaging standards.)) Furthermore, it is increasingly recognized as a crucial piece to improve health systems to achieve the WHO Millennium Development Goals [4].

Poor strategic planning and a lack of international standards consume government budgets without reaching good results [5]. Beginning to develop systems without having a defined framework means implementations might fall into serious common mistakes. Without first identifying standards policies, network connectivity and Internet access, master files and unique identifiers it could lead us to waste time and resources. Even though experience and resources for early implementation projects in developed countries are available, in many developing countries there are still barriers and difficulties to access these resources.

eHealth care is a challenge that all countries face today, irrespective of their development status [4]. Some aspects that threaten system implementation in the health sector involve economic resources [6], income disparities, exorbitant costs of usage fees, excessive costs for even rudimentary health information systems [7], lack of human trained resources [8], lack of governmental policies that address a well-defined health system that incorporates eHealth [9], cultural aspects [10] and some resistance to the use of computers for health care processes. Also, standards policies have the potential to play a major role in system interoperability. Ensuring standards, generating guidelines, and introducing essential policies based on effective and efficient evidence could be necessary [11].

The aim of this work is to identify the main challenges and hurdles for the eHealth maturity of economically developing countries, located in Asia and South America.

### Materials and Methods

In order to collect data about challenges and hurdles for eHealth implementations, we conducted a survey. A short, semi-structured, confidential interview was conducted by one physician trained in the field with special care to query respondents to answer about their spontaneous perception or personal knowledge.

**Setting:** Data collection was carried out among those attending INFOLAC 2014 the Latin American Conference on Medical Informatics organized by the Uruguayan Society of Health Informatics in Montevideo Uruguay from 16th to 17th October 2014 [12] and APAMI 2014, the Asia Pacific Association for Medical Informatics Conference organized by the Indian Association for Medical Informatics (IAMI) in New Delhi, India from 30th Oct to 2nd November 2014 [13].

**Design:** The design of the study is a cross-sectional descriptive study.

**Sampling strategies:** From the meeting attendees, consecutive convenience sampling was performed on

attendees until three participants from each country participating in the events had responded to the survey.

The number of participants proposed for this study was 60 surveys in total.

**Inclusion criteria:** Individuals carrying out activities in the field of medical informatics in their country attending either INFOLAC 2014 or APAMI 2014.

**Exclusion criteria:** Those who could not answer more than two questions will be excluded.

Attendees will be able to add comments and suggestions that will be used in future studies.

To determine the obstacles to implementing eHealth in developing countries, we first identified the elements necessary to develop eHealth according to other studies, mainly in developing countries [14]. These variables are: 1) Economic support by the government for eHealth, 2) eHealth training, 3) Cultural or educational problems for implementation of eHealth, 4) Standards policies in terminology or messaging, 5) Policies in eHealth.

Questions for INFOLAC 2014 were made in Spanish and in English for APAMI 2014.

The questions for the anonymous survey were:

1. Is there any economic support by Government for eHealth?
2. Does Government organize eHealth courses or training?
3. Do you consider that there are cultural or educational problems for the implementation of eHealth?
4. Does your country have any standards policy in terminology or messaging in eHealth?
5. Does your country have eHealth status policies for long periods?

## Results

All respondents agreed to participate in the study. Personal information was kept confidential. From the 60 proposed surveys, 27 were from South America and 33 from Asia. Four surveys were excluded due to not fitting the inclusion criteria.

The results of the survey showed the following:

1. "Is there any economic support by Government for eHealth?" Answer was 'Yes' in South America 33% of the time (Table 1 and Figure 1) and in Asia, 79% (Table 2 and Figure 2). The result across all countries was 58% (Table 3 and Figure 3).
2. "Does Government organize eHealth courses or training?" Answer was 'Yes' in South America 15% of the time (Table 1 and Figure 1) and in Asia 33% (Table 2, Figure 2). The result across all countries was 25% (Table 3 and Figure 3).
3. "Do you consider that there are cultural or educational problems for the implementation of eHealth?" In South America, respondents answered 'Yes' 100% of the time (Table 1 and Figure 1), and 91% in Asia (Table 2 and Figure 2). Considering all countries, 'Yes' was selected 95% of the time (Table 3 and Figure 3).
4. "Does your country have any standards policy in terminology or messaging in eHealth?" The answer was 'Yes' in South America 33% of the time (Table 1 and Figure 1), and in Asia 42% (Table 2 and Figure 2). There was a positive answer across all countries 38% of the time (Table 3, Figure 3).

5. "Does your country have eHealth status policies for long periods?" Answer was 'Yes' for this question in South America for 41% (Table 1, Figure 1) of respondents, and 58% in Asia (Table 2 and Figure 2). The results for all countries was 50% (Table 3, Figure 3).

Table 1 - South American respondents

		%
1	Economic support	9 33
2	Training	4 15
3	Cultural or educational problems	27 100
4	Standards policy	9 33
5	Policies for long periods	11 41
Total		27

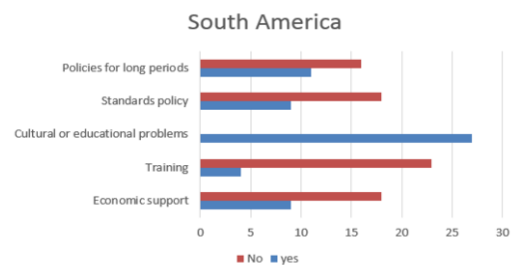


Figure 1 - South America respondents

Table 2 - Asia respondents

		%
1	Economic support	26 79
2	Training	11 33
3	Cultural or educational problems	30 91
4	Standards policy	14 42
5	Policies for long periods	19 58
Total		33

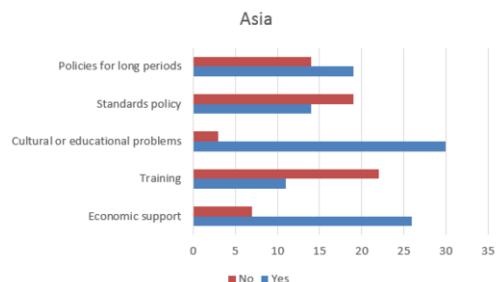


Figure 2 - Asia respondents

Table 3 - All respondents

			%
1	Economic support	35	58
2	Training	15	25
3	Cultural or educational problems	57	95
4	Standards policy	23	38
5	Policies for long periods	30	50
Total		60	

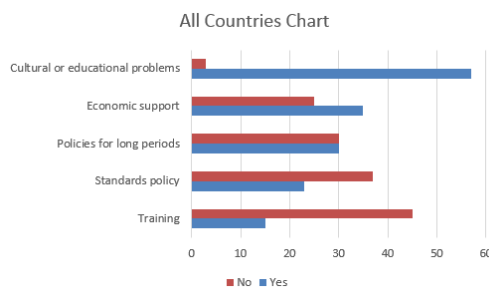


Figure 3 - All respondents

Table 4 - All respondents, comparison by region in %

	Asia	S.America
Economic support	79	33
Training	33	15
Cultural or educational problems	91	100
Standards policy	42	33
Policies for long periods	58	41

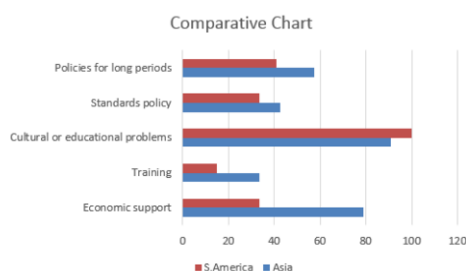


Figure 4 - All respondents, comparison by region

Results shown in both regions were very similar about the role of the states in relation to national policies for long projects, standards policies, cultural issues and education for eHealth. The role of the state in relation to training and economic support in eHealth was perceived differently in the analyzed regions, being more intense in Asia than in South America. (Table 4 and Figure 4).

## Discussion

This was a preliminary survey to get an overview of the situation in our region and pave the way for more complex studies.

Training of human resources in eHealth is critical, because we think it is one of the limiting steps of high impact, not only from a technical standpoint, but as a change management tool.

It is interesting to note that participants agree that eHealth development will require more universal eHealth interoperability standards and strategies to overcome technical infrastructure barriers and address privacy, security, and other legal requirements [15]. We should take advantage of the lessons learned in developed countries in order to optimize the strategies to achieve this goal.

Concerning regulatory legal and policy framework, it is difficult, in most of our countries to find clear policies and coordination between state or governmental agencies and eHealth initiatives. This is a huge obstacle to implementing eHealth in developing countries.

Instability in political issues make it really difficult to find policy governance for long-term projects. Governments want centralized systems instead of dictating long-term policies that enable the local developers to interoperate with other regional developments through clear policies standards. In many of our countries there are no state policies, and if there are, they often change when the government and projects fall or are changed by others. Developing policies for eHealth requires long-term political times exceeding consensus and projects [16].

One of the limitations of this study is the sample. We collected the data at only two events in South America, during INFOLAC 2014 conference and during APAMI 2014. It could be necessary to extend the coverage of the sample for our next studies. Even so, our results are consistent with the work of Lacroix and colleagues that report that one of the main problems has to do with the educational training [17].

## Conclusion

eHealth is a promising concept to achieve better health for all. The present study suggests there is a huge gap in cultural and educational issues regarding eHealth. Also, according to our results, we must take into consideration long-term eHealth projects. It is very important to consider interoperability and standards in eHealth as well. We have to work hard to solve the obstacles presented to achieve health for all and not settle for anything less.

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