

## Challenges and Opportunities in eHealth: the Afghan Case

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### Abstract

Electronic Health (E-health), is defined as the use of Information and Communication Technologies (ICT) in health systems. A well-working health system is an essential necessity for people. E-health can change the World in all developed and developing countries. In this paper, we focused on healthcare problems, challenges, and opportunities in Afghanistan. Currently, Afghanistan has no E-health system as the whole health system is the paper based. We conducted this study in several hospitals to identify the most typical challenges for developing E-health system in Afghan context. While most challenges are quite similar to those of developing countries, we found some specific of Afghanistan. Also we discussed some opportunities for e-health in Afghanistan.

**Keywords:** E-health, Afghanistan, E-health challenges, developing countries

### 1. Introduction

According to Afghan policy and strategy the health system in Afghanistan is one of the main responsibilities of the Ministry of Public Health. The Ministry carries out this responsibility in a number of ways including: looking at trends in health priorities, scouting for information needs; and supporting policy making with reliable data. Planning, monitoring, and evaluation are also key functions of the Ministry, which aim at assessing progress on health outcomes and other results. The one of ways for improving the health supported by electronic processes and communication is e-health, which is a relatively recent term for healthcare practice.

Among the most frequently cited definitions of e-health is one defined by Eysenbach: “e-health is an emerging field in the intersection of medical informatics, public health and private health, referring to health services and information delivered or improved from first to last the Internet and related technologies” [4]. Overburdened and collapsed public health care system is also taking ICT route in different countries. Changing the dynamics of health care is the major objective.

Considering existing literature [6,9,11,13,15,16], the most typical e-health related challenges in the developing countries are:

- Poor economy;
- Undeveloped infrastructures;
- High cost of medical services;
- Absence of the computerized systems and database;
- Lack of Internet connection;

- Paper based patients' records;
- Low level of patient education;
- Lack of time of healthcare professional.

In the current study we aimed to find whether Afghan e-health related challenges have any peculiarities, or if they can be just considered as a typical case of developing country?

For this study, we aimed the following research question: What are the most important problems in the existing health-care system in Afghanistan? By answering to this question we can come nearer to our general challenge – to develop and evaluate a systematical approach for designing and deploying e-health system in the developing countries.

The study is based on a structured interview, which had a goal to identify problems in the existing health care system and possible challenges for e-health in Afghanistan.

## 2. E-health concepts and challenges

E-health is a field in the intersection of health informatics, public health and commerce, referring to health services and information delivered or improved through the Internet and related technologies. In a broader sense, the term characterizes not only a technical development, but also a state-of mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology [8].

The e-health explains the application of Information and Communications Technologies (ICT) across the complete range of tasks that affect health through the different existing solutions. E-health combines utilization of electronic communication and information technology to transmit, store, and retrieve digital data for clinical, educational, and administrative purposes, both at the local site and at distant sites [16]. In other words, eHealth Industries Innovation (ehi2) Centre defines E-health as a better healthcare and a healthier life through the digital technology (eHealth Industries Innovation Centre, n.d.). The following four interrelating categories are included in a description of the term e-health:

- 1) Clinical Information Systems
  - a) Specialized tools for health professionals within care institutions (e.g. hospitals).
  - b) Tools for primary care and/or for outside the care institutions such as general practitioner and pharmacy information systems.
- 2) Telemedicine and homecare, personalized health systems and services, such as disease management services, remote patient monitoring.
- 3) Integrated regional/national health information networks and distributed electronic health record systems and associated electronic health record systems and associated services such as e-prescriptions or e-referrals.
- 4) Secondary usage non-clinical systems
  - a) Systems for health education and health promotion of patients/citizens such as health portals or online health information services.
  - b) Specialized systems for researchers and public health data collection and analysis such as biostatistical programs for infectious diseases, drug development, and outcomes analysis.
  - c) Support systems such as supply chain management, scheduling systems, billing systems administrative and management systems, which support clinical processes but are not used directly by patients or healthcare professionals (eHealth Industries Innovation Centre, n.d.).

Properly developed e-health system is important for developed and developing countries. Each person must have access to a good health system. Larger access to health care has been related to well health situation, more repetitious use of preventive services, and lower hospitalization rates. The health of people is a different important topic in public policy discussion in every complete society often determining the deployment of big society. Data collection is one of main components of public e-health system. Decision makers, policy

makers and health services workers need correct and timely data in order to improve the quality of their services [6].

### 3. Methodology

The goal of this research is to develop and evaluate a systematical approach for designing and deploying e-health system in the developing countries. To achieve this target, we used the purposive case sampling [2]. The purposive sampling is different from random sampling or probability sampling in which the character of the population is defined and all members have an equal chance of being selected [5].

The ethnographic study sample can be described as purposeful or purposive as the participants have specific knowledge or experience of interest to the researcher [7]. Murphy et al. defended this approach by using the concept of empirical generalisability, which is based on the notion of purposive sampling in order to establish the typicality of settings or groups [14]. Therefore, ethnographic research can result in empirical generalisability [7].

Afghanistan consists of 34 provinces; each province has one, two, or three public hospital. There are 21 big public hospitals in Kabul, and also some public clinics in Kabul city. We have some private's hospitals and clinics in this city. For this study we have selected three hospitals and used the typical case sampling. The typical case sampling imports taking a sample of what one would call typical, normal or average for a specific phenomenon. Typical case sampling is a purposive sampling technique used when you are interested in the normality/typicality of the units (e.g., people, cases, events, settings/contexts, places/sites) you are interested, because they are normal/typical [12].

### 4. Study Design

We conducted the study during November - December 2014 and we used focus group interview method. We had a set of questions for all groups, an interviewer asked a question to a group, then respondents answered it, and the interviewer wrote the answers.

In this study, we interviewed doctors, nurses, managers, and patients in three hospitals. We have conducted the interview altogether with 61 doctors, hospital managers and patients in hospitals of Kabul and another one province.

The study was divided to two phases. In the first phase we have made a pre-survey, where we have focused on the main challenges. The goal of pre-survey was to identify more specific challenges in healthcare. In the second phase we have conducted an interview to find the deeper challenges related to development of the e-health system.

In the pre-survey, we at first interviewed 25 peoples in Ali Abad hospital. This hospital has 95 people staff, including: faculties, specialists & trainers, nurses, technicians, anesthetists, administrative personnel and supportive staff who are involved in delivering teaching, researches and healthcare services for the citizens. We also involved patients into the study. The patients are the main part of health system; therefore we expected to get additional insight to the patients-related challenges like a lack of medical/physical examination time, problems with patient registration system.

Ten doctors in Ali Abad hospital were male 29 - 54 years old. Five of female and three of male nurses were 25 - 40 years old. Seven peoples were managers in deferent offices, five of these were female and two people were male 23 - 51 years old.

In the second interview, we have interviewed 16 people, five of them were male and two of them were female doctors, 39 - 60 years old. Four people were patient record managers, they were 30 - 52 years old, three of them were male and one of them was female. Five peoples were patients in bed, 21 - 41 years old male.

Maiwand Teaching Hospital, formerly known as Mastoorat Hospital has one-century long history. Maiwand is an internship-based hospital which pertains to the Kabul Medical University. This hospital has totally 37 people's staff including; faculties, specialists, trainees-

doctors, nurses, radiologists, and service personnel who are involved to a function of teaching and healthcare services to KMU students and citizens. It has 350 beds for patients, which are used to teach students and researchers. Every day there are over 700- 800 deprived patients being diagnosed and treated at Maiwand without charge.

In the Maiwand public hospital we interviewed 20 people, twelve people were doctors 25 - 55 years old, 8 doctors were male and four of these were female. Eight people were patients in bed 13 - 20.

In the pre survey interview questions, we identified the following challenges:

- Patients' records;
- Prescriptions management;
- Medical decision support;
- Rooms/ beds management;
- Billing management;
- Health information collection methods;
- Communication infrastructures;
- Health system cost.

These challenges then were used as guidances for questions, which we designed for the second, interview-based phase of the research.

## 5. Interviews

In the second phase we have conducted interviews in several hospitals. We used a structured questionnaire in this study for collecting information about the challenges and problems in the health care system in Afghanistan. For that we developed a set of questions which encourage participants to respond.

Interviews are a far more personal form of research than questionnaires. Unlike with mail surveys the interviewer has the opportunity to search or ask follow up questions. We used focus group interview for collecting data for our research from interviewer. Focus-group interviews are appropriate for exploring what individuals believe or feel as well as why they behave in the way they do. They offer a useful vehicle for involving users in health care management system and strategy development needs assessment, participatory planning and evaluation of health promotion and nutrition intervention programs. Focus groups could provide information about a range of ideas and feelings that individuals have about certain issues, as well as helpful the differences in perspective between groups of individuals [1]. Among other advantages, focus groups are a flexible assessment tool. Interactions between the moderator and participants allow the moderator to investigate issues in depth, address new issues as they arise, and to ask participants to elaborate on their responses [10].

We have conducted focus group interviews in three public hospitals in two big cities (Kabul and Jalalabad). In each hospital, we did the focus group we interviewed participants about challenges and problems they had in their hospital system. In each group we asked questions and respondents gave the answers that were written on paper.

In Kabul city, we did the first interview in Ali Abad public hospital with doctors, nurses, managers and patients. We asked the same question to all respondents. In that interview the respondents gave answerer to the interviewer questions and they mentioned to some health system challenges in their hospital. In the same way we have organized the third interview in Kabul city. In Jalalabad city, we did the second interview in Jalalabad public health hospital. In that hospital we did interview with doctors, nurses, managers and patients.

For the interview we have used prepared structured questionnaire with the following questions:

1. A name of a respondent.
2. An age of the respondent.
3. A name of a hospital.
4. What is your position in hospital?
5. How long have you been work in this hospital?
6. How often do you use a computer at work?

7. Do you have computerized system in your hospital?
8. Is the patient registration system computerized?
9. Do you have central database system in your hospital?
10. How can we manage better health system? (The purpose of this question is to have an understanding what ways people see for improvement of the current health system. This question is for doctors, nurses, managers and patients).
11. What are the challenges in the health data collection?
12. What are the challenges in the data security?
13. Which problems exist in an ambulance system?
14. What is the best way for collecting data?
15. What should be changed to improve services for mothers and children? (This question is intended for doctors, nurses, managers and patients).
16. Do doctors have the good schedules for patient examination?
17. How do you control an expiring date of drugs in hospital?

An analysis of the gathered data had the following steps:

1. Review the purpose of the evaluation and what we want to find out;
2. Identification of a few key questions that we want our analysis to answer;
3. Review of observer notes and transcripts focus the analysis.

## 6. Results

As mentioned above, during the interviews, we focused on challenges which we identified in previous research: patients' records, prescription management, medical decision support, rooms/beds management, billing management, reliable communication infrastructure and lack of data accuracy and consistency of reporting health data.

In first set of interviews the respondents were invited to discuss these challenge in their health units. In these interviews all respondents mentioned that they do not have computerized system, computerized patient registration system, central database system in the hospital. They also have mentioned about some problems in ambulance system, lack of system for medicine expiration date. In the paper base system the data is not secure. A computerization of ambulance system could improve services for mothers and children. Patients mentioned about a lack of good patient examination schedules, shortage of an electronic power and lack of infrastructures.

A director of an hospital gave the information about the challenges we mentioned above. He told that the patient record is paper-based, the patient manager records patient's information in the registration books. After the registration process, the patient manager creates the patient's file. The patient's files are also paper-based. The prescription management belongs to a doctor, the doctor writes the prescription to patients manually too.

The medical decision support is belonging to laboratory. The public hospitals are free but pharmacy costs a price. The pharmacies have no a computerized system, the pharmacist manage records manually. The rooms and beds management is also paper-based. Some provinces hospitals do not have the computerized systems, network connections and database system. Some hospitals have a challenge related to the Internet connection. The health care system is a quite expensive for patients. Some hospitals have no necessary laboratory material for medical examinations. The patients do these medical examinations in the private laboratories and have to pay for that costly price. They have no centralized database system in hospitals, and the centralized database system is apparently necessary for an improvement of the health care system.

The participants of the study in Jalalabad Public Health Hospital mentioned the following challenges: the patient's records are paper-based; they are not secure and the patients cannot receive their information quickly. The participants mentioned a problem with the Internet connection, which is unavailable in this province. Sometimes they have problems with the

lack of electric power, and some patients have transportation issues. Some patients live in villages, they do not receive health care service on time, and sometimes they just lose paper-based prescriptions. The doctors and patient records managers mentioned a lack of the central database, and a lack of connection between the hospitals in this province and hospitals in other districts.

In the Maiwand Teaching Hospital the doctors told us about these problems in the health sector, such as a lack of computerized system, a lack of network infrastructures, an absence of central database, paper-based patient record system, and big cost of the services.

The patients mentioned several other problems: the examination process takes too much time, the health system is very expensive, and doctors do not have enough time available for the patients' examination. The doctors mentioned the lack of infrastructures, ambulance system, a lack of security in the paper-based data, lack of internet connection, lack of computerized system for patients' registration, and lack of schedules for patient check

Another big problem that was identified is a time of laboratory test: a laboratory blood check system is not computerized and writing text manually takes too much time. The pharmacies have no the computerized system and drugs expiration dates often are missed.

## 7. Conclusion

In this research we focused on the question “what are the main information related problems in the existing health-care system in Afghanistan?” for this purpose we have interviewed healthcare professionals and patients in several Afghan hospitals.

As it was mentioned above, in literature study we identified the most common challenges for e-health in the developing countries: poor economy, undeveloped infrastructures, high cost of medical services, absence of the computerized systems and database, lack of the Internet connection, paper based patients' records; low level of patient education; lack of time of healthcare professional.

The challenges that we have identified in our study were quite similar to the challenges defined in the literature. The biggest challenges for Afghan case are lack of Internet connection, electronic power system, big cost of health service, lack of computerized systems, and the paper based system.

However, we see some future opportunities that e-health solutions can bring into the country. They are related to the following issues:

- Patient records are paper-based. This issue is related to a general e-health challenge of computerization of health care sector;
- A cost of health services and time lack. After investing into E-health system, it can significantly reduce an amount of manual work and make the services more accessible in terms of the price;
- Patient education. E-health communications channels can be used for informing patients about upcoming threats and improve the general level of awareness among them;
- Lack of the infrastructure. Some provinces hospitals do not have the computerized system, network connections, and database systems, some hospitals have problems with the Internet connection.

Overall, for design of e-health system in Afghanistan we need consider computerized system, good network and Internet connection, better interface for information management system, good plan for management, infrastructures, central database systems for data collection, plan for staff training in E-health system, good electronic power system, system for check quality of medicine, plane for improve mothers and children health system, and plan for improving the services for patients.

Some developing countries have E-health system and they have some challenges in their E-health system. The design good system will be take some years, which we do not have E-health system in our country. We could use the other developing countries experience for develop good E-health system in Afghanistan.

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