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# A Perspective on the Influence of Health Policy on Health Technology Use within the Arab World

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**Abstract.** Health information technology (HIT) is a tool used to achieve hospitals' goals and objectives for improving patient care. There has been considerable debate within the health informatics community about the role of health policy in shaping health information technology uptake within healthcare. Some argue that rapid advancements in technology have influenced the use of health information technology by healthcare institutions; whereas others argue that health policy shapes the use of health information technology within the healthcare field. Both arguments make valid points. With this debate in mind, the purpose of this position paper is to present an argument regarding the influence of health policy on the development of health information technology within the Arab World. In this paper, we argue that health policy strongly influences health information technology uptake within the Arab World.

## Introduction

Governments today are attempting to develop new social services through the use of various information technologies in ministries, companies, schools and hospitals. With increasing numbers of patients, specialties and diseases, all hospitals require well-defined systems that enable them to view, manage, retrieve and summarize data in advanced, simple, rapid and secure ways. The Arab World is facing enormous challenges and requires effective tools and strategies that help in improving healthcare delivery.[1] Although some Arab countries have abundant resources that can be used to modernize the health sector, other countries lack appropriate levels of education and political stability and have low security, few resources and unique cultural contexts that may hinder advancements in these areas.[2] These factors affect the level of healthcare services. Experts in the Arab World argue whether health information technology drives health policies or whether health policies influence health information technology within the Arab World region.

Before examining this argument, the two parts of the argument must be clearly defined. First, a working definition of Health Information Technology (HIT) is needed. HIT is the field of information technology (IT) that includes the design, development, use and maintenance of information systems for the health industry.[3] HIT has many advantages, such as cost reduction, higher efficiency rates, error reduction and superior services for patients.[4] The main component of the HIT infrastructure is the Electronic Health Record (EHR), a digital record shared between various hospital facilities or

external agencies.[3] The EHR supports the tracking of public health problems and strengthens health services.[4]

In contrast, health policy describes the government initiatives to improve public health and all related procedures and guidelines.[5] The government usually translates its strategic objectives into programs and initiatives through the policy-making process. Healthcare policy is the part of health policy that focuses on the delivery of healthcare services by training health professionals, managing the safety of drugs and medical devices and controlling public programs such as health insurance. There are three types of health policies.[6] The first type is governance policies, which focus on organizational structure. The second type is service policies, which measure the level and pattern of services. The third type is practice policies, which relate to practitioners' use of resources in delivering patient care. Based on the definitions of these two parts of the argument, we can see how both sides play important roles in ensuring superior healthcare delivery in the Arab World.

There has been debate within health informatics about the factors that influence HIT uptake within the healthcare system. Some argue that health policy, such as the introduction of Medicaid and Medicare in the U.S., encouraged the uptake of HIT because it facilitated reimbursement for services. Others argue that the perceived benefits of technological innovations for improving healthcare services and reducing costs spurred healthcare organizations to use health information technologies. Both points are valid depending on one's perspective. Within the Arab World, we believe that health policy has played a much larger role in influencing HIT uptake than recent technological innovations.

In this position paper, we argue that health policy has influenced the uptake and use of HIT within the Arab World. We provide claims that both support and oppose this argument. The paper also provides a conclusion summarizing the main points of this argument.

**Counter Claim Argument:**

Some people in the Arab World argue that technological innovation in the healthcare sector influences health information technology policy. This argument has many valid points.

First, because much of the population in the Arab World is young and technology savvy, as patients, healthcare professionals and policy makers, they are inclined to use technology and to request that it be implemented within the healthcare sector. They contend that other industries within the Arab World, such as travel agencies and banks, use technology to streamline business processes and services with great effectiveness and that a similar use of technology is needed to improve healthcare service delivery and reduce costs. Another argument is that HIT within the Arab World is provided by western international companies that have extensive experience in developing HIT in the health industry. These companies offer HIT that follows international best practice

guidelines, which standardize health policies within healthcare organizations. HIT uptake within the Arab World produces a standardized and efficient healthcare system in which patients have increased access to care as a result of improved healthcare services supported by standardized health information technologies.

The arguments claiming that HIT has a strong influence on shaping healthcare policies are valid. However, there are various arguments that counter them. Regarding the first point, which argues for a technologically savvy population that demands increased technology use, population growth and disease in the Arab World contribute to health challenges rather than to technological challenges. Therefore, strong health policy is necessary to influence how technology is used to address the upcoming healthcare challenges within the Arab World. Future healthcare challenges in the Arab World, such as the increasing demands for information availability and efficiency of healthcare services, decreasing maternal mortality and an emphasis on preventive care, require strong health policies to improve HIT performance, health outcomes and patient satisfaction.[1,2]

Regarding the second point, that technology uptake introduces standardization within the Arab World because HIT incorporates best practices, is also flawed. Although HIT provides advanced services, it cannot control medical mistakes unless it includes well-defined and consistent policies to manage the use of these systems. For example, a physician may make a mistake by selecting an incorrect dose of medicine. Although advanced HIT can use Computerized Provider Order Entry (CPOE) to inform the physician about the improper dosage, a strict policy must be incorporated into the system to prevent the physician from making this mistake. For example, displaying an alert for specific situations or adding conditions that require a specialist to approve any critical medicine before it goes to the pharmacist's inbox can help to prevent medical errors. The United Nations and the Arab League have found that the poorest Arab nations, such as Yemen, Sudan and Iraq, were unable to meet goals in fighting HIV/AIDS and malaria. This difficulty results from the unstable health system, which requires well-defined and sustainable health policies and guidelines implemented through HIT to produce long-term progress in healthcare services.[6,7,8]

A specialized HIT company can provide excellent products to serve multiple hospitals, but it cannot cover all of the concepts, models and strategies needed by all Arab countries. All of the countries in the Arab World differ in terms of their hospitals, policies, objectives, resources and goals. These differences may result from diverse cultures, hospital roles and services. For instance, many government hospitals in the Arab World provide free healthcare services for patient and outpatient services. These facilities require specific health policies and procedures in HIT to manage and achieve the hospital's objectives. The World Health Organization (WHO) is scheduling meetings to enable policy makers to provide new strategies to improve health outcomes and to develop health systems. Moreover, each hospital must secure its data from system users in different ways depending on the users' jobs and responsibilities. HIT enables users to securely view, modify or display the necessary data. However, health policy will determine how and when specific users can view and save the data. These policies must be incorporated into all systems and each HIT must apply these procedures.[9,10,11]

Based on our experiences within the Arab World, specifically Saudi Arabia, we can confirm that health policy directly influences the use of HIT within hospitals. For example, the National Guard Health Affairs (NGHA) hospital has a separate department for managing and modifying any requirements by the system's users. More than twenty application analysts work every day to change the workflow, options and forms of the system according to department policies or newly required procedures. For example, a policy that required documentation for certain types of infant deaths forced the hospital's management to request an additional form from the HI team to manage this condition. A new Medical Record Number (MRN) was added under the mother's MRN with specific fields to accomplish this request. For these reasons, we believe that hospitals cannot succeed without applying appropriate health policy to its HIT.

**Our Argument:**

We believe that health policy should strongly influence HIT uptake within the Arab World. For a health service to work well, we must begin by understanding the needs of patients and develop policies and technologies that support these goals. Policy makers play a role in defining policies that serve the local needs of Arab populations and that take into consideration political, cultural, health and economic issues. Policies to promote health should be introduced by policy makers and supported by HIT. This paper presents six main points that indicate the health policies and actions that are needed within the Arab World for the successful implementation of HIT. We understand health information technology as a tool that supports health rather than a tool that influences how healthcare should be conducted within the Arab World.

***Point I: Implement strong policies to manage continued health challenges within the Arab World.***

Arab countries have made significant improvements in health services since the 1950s. However, healthcare continues to face major challenges that require strict health policies and guidelines to resolve these issues. Even if advanced HIT is used in hospitals, specific policies must be implemented to achieve the goal of effective patient care. In 2002, a conference on public health for health policy makers was conducted in Beirut, Lebanon and organized by the World Bank and the World Health Organization (WHO).[2] The conference highlighted the importance of public health methods and the need to implement health policies in all health systems. Despite the fact that the Arab World requires different tools to improve health and enhance development, many parts of the Arab World have the financial and labor resources necessary to implement this change. Several key policy issues must be considered to improve health services through the use of HIT:[2]

- Increase cooperation between Arab countries to improve health policies and programs.
- The health agenda must include social, economic and political conditions within health systems.

- The health agenda must be implemented in poor countries such as Iraq and Palestine to support them in the development of their health systems and to meet health policy requirements.
- Arab countries must identify their own health development solutions by ensuring the use of all required health policies in their health systems.

An Healthcare Information and Management Systems Society (HIMSS) of Europe, the Middle East and Africa (EMEA) Leadership survey conducted in 2007 found that the Middle East CIO's top IT issues included implementing EHRs, connecting hospitals and integrating Electronic Medical Records (EMRs) into systems.[12] The Middle East CIO determined that these issues could be solved through a national policy agenda that allows patients to have their data with them in any location.[12]

In the Fifth Annual Arab World Conference that took place in Qatar in 2010, the professionals attending the conference discussed some of the challenges faced by the Arab World, such as population growth, aging and disease.[1] Because of globalization, more HI systems are available for clients and many challenges are increasing, such as the demand for data availability and system efficiency. This conference attempted to identify ways to improve the performance of health systems using "health policy" experts who can address these challenges by applying health policies and roles in HIT. In addition, the participants in the conference agreed that the 21st century would transform the Arab World into a knowledge-based society through the use of new health information technologies. This goal requires a strong role for science that can provide practical recommendations and efficient health policies to improve patient care in the Arab World and accelerate this transformation.[1]

***Point II: Develop HIT policies that are sensitive to Arab and Muslim culture.***

In general, culture and religion and the strategies and concepts related to health services differ from one place to another, even if these places share the same international health policy. Likewise, in the Arab World, each country has distinct cultures and health methods. Therefore, each country requires specific HIT that considers its unique health policies and each organization must make some modifications and customizations to HIT appropriate for their health policies. The main reason that technologies cannot remove the social influence from these systems is that each HIT requires basic concepts, procedures and models that are community based. Thus, every HIT must serve its community's health policies. For instance, most of the Arab population is Muslim, so health policies and procedures must accommodate the needs of Islamic culture. This may involve additions and/or changes to international health policies in HIT, such as adding a Guardian Approval Form before patient admission in Saudi Arabian hospitals. Accordingly, even if an HIT is achieving its goals, it must also serve specific policies.[11]

In Saudi Arabia, the Ministry of Health allocated four billion Riyals for eHealth programs. These programs require specialists from different regions to study the current Saudi health systems and attempt to implement an advanced system capable of applying health polices appropriately and linking all hospitals and clinics. The NGHA in Riyadh is an example of a hospital that implements EHRs and integrates all hospitals together to enhance healthcare services. Currently, there are more than 300 EHR

software tools on the market. An EHR that is selected must have most of the desired tools and be able to execute all of the hospital's required policies.[13]

The importance of health policies forces policy makers to perform thorough research and to ensure that health policies are used optimally in hospitals to serve patients. This research should focus on the needs, concepts, roles and cultural effects of each country. Unlike HIT, policy application in hospitals must be continually measured to ensure the best healthcare delivery. Therefore, many changes or additions must occur within HIT to implement all required policies. In the Arab World, ministries of health should develop guidelines for researchers to enforce adherence to health policies. This will help in accomplishing the necessary concepts and strategies and improving the quality and effectiveness of healthcare.[6]

Strategic policy in the healthcare system must be based on behavioral information. These behaviors can come from family, community or healthcare services and they typically translate into well-studied health policies by international health industries. In the United Arab Emirates (UAE), a Country Cooperation Strategy (CCS) between the WHO and the UAE 2005–2009 planned to gather and use health information to guide policy makers and providers of future health systems. This strategy aimed to improve health services and quality of care in the UAE by ensuring that all health systems are in line with national health policies to achieve their health goals. The UAE's ministry of health focuses on developing long-term plans and management guidelines to support policy makers in reaching their goal of applying all required policies in the country through HIT.[14]

***Point III: Create a comprehensive HIT that implements equity in health policies to resolve health inequity in some Arab countries.***

In some developing and developed countries, health inequity remains a major challenge. In a number of Arab countries, this inequity may be related to a lack of inclusive health services. For example, some countries have free health services for all residents, whereas others require health insurance. In 2009, the International Union for the Scientific Study of Population agreed that this problem requires an understanding of equitable health policies achieved through collaboration between researchers, organizations and national policy makers to increase knowledge about the importance of equitable healthcare and how it can improve the delivery of health services. A comprehensive health information system based on these health equity policies will serve all segments of the population in this countries.[15]

In addition, the United Nations and the Arab League have noted that the Arab World faces challenges in the fight against HIV/AIDS, TB and malaria. Some of the poorest nations, such as Yemen, or countries at war, such as Sudan, Iraq, Somalia and Palestine, are unable to successfully fight diseases due to instability and violence. These issues may affect the healthcare process. Strong health policies and strategies in HIT are necessary for long-term improvements in these countries' health services.[8]

In 2000, the government of Saudi Arabia called for a committee to review the healthcare services delivered to its residents. This review focused on the lack of HIT applications, health services management and health services delivery in health

organizations. As a result, a special taskforce was established in 2002 to improve strategic IT plans for healthcare in Saudi Arabia. The goal of this committee was to improve the IT that serves the need for better health services, which requires the best HIT to apply the implemented health policies.[16]

***Point IV: HIT cannot prevent or reduce medical issues unless it applies strong health policies.***

Health policies are needed to prevent and eliminate medical issues. Even advanced HIT cannot reduce these issues unless clear and comprehensive policies are implemented in healthcare. According to the World Malaria Report, part of the WHO Middle East Time reports in 2008, countries such as Algeria, Egypt, Iraq and Saudi Arabia are among 10 countries worldwide that have effectively reached the elimination stage for malaria. This has been accomplished through enhancements in disease intervention resulting from effective health policies and procedures within their health systems.[17]

The WHO also hosted the "Montreux Challenges: Making Health Systems Work" conference in 2005, which presented various programs, plans, standards and policies to determine the most suitable ways to reduce disease, improve health systems and develop health outcomes. For example, the WHO developed health policy and service guidelines for mental health and provided technical assistance to many Arab countries, such as Bahrain, Egypt, Oman, Saudi Arabia, UAE and Tunisia, with the goal of improving policies for treatment and implementing them through HIT.[10]

Public health problems require public solutions. Instead of asking individuals to change to solve these issues, general public policy solutions must be developed and applied in HIT to manage these problems. People are ready for a social evolution in health services if it helps to reduce public health problems.[18]

***Point V: A good HIT needs clear policies to ensure its security and privacy.***

The security and privacy of health systems requires that strict policies be implemented in HIT. Workers in the healthcare sector understand the need for maintaining confidentiality in patients' data. New remote and high-speed access to digital technology creates new challenges for healthcare providers, governments and individuals. Therefore, research must be conducted to ensure that a selected IT system covers all healthcare requirements. An assessment of an IT product must be comprehensive enough to determine how the organization's privacy will be controlled in the HIT. For instance, the Medical Record (MR) department at NGHA Dammam has been able to print specific radiology reports through the QCPR system. This option was included in the system by providing the users' departments with a link to the PACS system that allows them to view and print reports. Recently, a memo from the Director of the PACS system included a new policy that prevented MR from printing these reports from the PACS system. The policy said printing must be done through QCPR and not through PACS. Therefore, all access to printing through PACS was restricted and the link in the QCPR became useless. This policy required the QCPR application team to make changes to the HIT to provide MR with necessary reports through QCPR itself.[9]

***Point VI: Most hospitals have specific IT teams that manage their HI system by implementing all required health policies.***

Every hospital needs a qualified technical team that can work together to constantly support HIT. This team must make changes to HIT according to hospital health policy; health policy cannot be changed based on HIT. Based on our experience as the first line of support for QuadraMed's Computerized Patient Record (QCPR) HI system at NGHA, we strive to modify HIT depending on the department or hospital's specific requirements. These requirements must serve the hospital policy, such as controlling users' privileges or changing workflows. New modification forms must be completed frequently with details of the workflow changes, form additions or functionality privileges to perform necessary work. These requests are sent to the application team in Riyadh, who considers the request, determines whether it complies with the department policy and then implements the changes. Arab users often resist changes due to their cultural backgrounds. Normally, they do not want to buy new HIT and change their policies based on a new system. Instead, they want to be able to change anything in the HIT through the application support team to support their hospital's health policies. In NGHA, very few cases ask the hospital to change policy because of the system requirements. In most cases, changes to the system are based on hospital policies.

The Joint Commission International (JCI), a recognized world leader in healthcare quality and patient safety, assesses NGHA hospitals every two years to ensure that the hospitals implement their policies in their health delivery. This assessment helps the hospitals to enhance their services, improve their quality of care and eliminate or manage many risks. If JCI offers recommendations, a new request is sent to the QCPR application team to implement new procedures in the HIT. This support ensures that health policy has a significant impact on HIT within the Arab World.

**Conclusion:**

The points presented in this paper support our position that health policy must be developed prior to the implementation of health information technology within the Arab World. All health policies must be applied prior to HIT implementation. Health information technology is crucial for supporting users, physicians, pharmacies and patients. HIT can increase staff performance through the use of tools that can improve healthcare services and enhance the quality of care. However, HIT cannot succeed unless it is based on strategic health policies that focus on patient care. Health policy implemented by international agencies and researchers who study the best ways to improve health services can ensure patients' safety and increase patients' satisfaction.

Both health policy and HIT have significant impacts on healthcare services in hospitals all over the world, including in the Arab World. Within the Arab World, the reasons mentioned above demonstrate that health policy has a strong influence on HIT.

In conclusion, health organizations, hospitals and researchers within the Arab World must emphasize health policy to ensure that existing health information

technology applies all required policies and procedures to produce advanced health services, minimize disease risks and improve health outcomes.

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