

STAKEHOLDER PERSPECTIVES ON E-HEALTH IMPLEMENTATION IN ARMENIA

Adanna Chukwuma and Marianna Koshkakaryan

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KEY MESSAGES:

- There is general recognition across stakeholders in Armenia that the e-health system can facilitate exchange of clinical and non-clinical information, transparency and accountability in service provision, and support for monitoring and evaluation.
- By tracking patient movement across health facilities, the e-health system links budgetary allocations to service use, enabling efficiency and supporting performance-based financing.
- However, scale-up of the e-health system has presented financial, technical, and organizational challenges that have negative implications for the sustainability of the system, efficient health care delivery, and the system's ability to meet informational requirements for health decision-making.
- There are opportunities to iteratively adapt the e-health system in Armenia through a systematic assessment of the e-health system scale-up experience and through regular and structured interactions between the private operator of the e-health system, key stakeholders involved in the implementation of the e-health system, and policy makers that can facilitate the adoption of needed changes.

Introduction

A health information system that provides relevant, timely and high-quality data is essential for decision-making, monitoring policies and programmes, and undertaking research in health systems. Ideally, health information systems should also be interoperable, allowing communication between databases and aggregating data into meaningful information within a global information system.¹ Thus, in December 2010, the Ministry of Economy and the Ministry of Health of the Republic of Armenia (RA) signed a Memorandum of Understanding, appointing EKENG CJSC to coordinate and execute

the implementation of the Integrated Health Information System of Armenia (IHISA), an electronic health (e-Health) system.² IHISA aimed to modernize health information systems in Armenia using technology.

Between October and December 2015, a pilot was implemented in six medical institutions to study the performance of IHISA given variation in key factors across facilities including patient flow and business processes. The pilot sites were Heratsi and Muratsan Medical Centers in Yerevan, Balahovit and Abovyan Medical Centers in Kotayk Marz, Goris Medical Center in Syunik Marz,

Vanadzor Polyclinic in Lori Marz and Ingo-Armenia insurance Company.³ More than 60 health workers and administrative staff were trained, entering over 100 patient records into the system during the pilot. Following the pilot, IHISA was rolled out to the 480 medical institutions that receive state insurance funding, supported by the World Bank through the Second Public Sector Modernization Project (PSMP-2). By May 2017, the system included information on over 32000 personnel, including 22000 doctors and nurses. The scale-up included training of over 600 health workers, administrative staff, and trainers in the Ministry of Health. This component was introduced into the PSMP-2 Project, through restructuring two years after approval, at the Prime Minister’s request, as it offered opportunities to strengthen accountability in the delivery of health services, improve efficiency in resource use through targeted allocation of state funding, and encourage comprehensive and real-time exchange of medical and administrative information.⁴ It is anticipated that IHISA will be extended to all health facilities, including dental clinics and diagnostic centers, and will allow for further integration of information with other state agencies.⁵

The adoption of an integrated electronic health information system was novel for Armenia, and at the time, for World Bank Projects in Europe and Central Asia more broadly. Understanding the perspectives of key stakeholders on the successes and challenges in the implementation of the e-health system provides lessons that are relevant for Armenia and other countries in the region that aim to adopt similar systems. Thus, through key informant interviews with 22 purposively-selected stakeholders, this knowledge brief explores the perspectives of stakeholders who were involved in the implementation of the e-health system or have been beneficiaries of its implementation.

The key informant interviews aimed to understand the perspectives of each stakeholder on the rationale for introducing e-health system; positive and negative experiences following the system’s introduction; and potential improvements that could be made to the e-health system. Stakeholders were purposively selected based on their influence over and/or interest in the design and implementation of the e-health system. In addition, stakeholders that might have been affected by design and implementation choices were also interviewed. Responses of stakeholders were summarized and anonymized. A brief description of the stakeholders interviewed is below:

Stakeholder	Number
Head medical doctor, Hospital	2
Head medical doctor, Primary Health Care facility	1
Head, Therapeutic department	1
Financial manager	2
E-health system operator in Health Care Facility	4
General practitioner, Primary Health Care facility	2
General practitioner, Hospital	2
Ministry of Health representative	1
Private sector practitioner representative	2
Member, Health Project Implementation Unit, World Bank-Supported Project	1
National Institute of Health representative	1
Private insurance company representative	1
Patients, only one of whom had access to the e-health system.	2
Total	22

Study Findings

- 1. There is a general recognition across stakeholders that the e-health system can facilitate exchange of clinical and non-clinical information, transparency and accountability in service provision, and support for monitoring and evaluation.** The interviews highlighted that physicians recognized the need for efficient communication between providers and with patients, that could be facilitated by technology. Also, insurance companies recognized that an e-health system may allow easy communication with health care providers electronically and access to the medical records of consumers. However, interviewees noted that these gains were conditional on national adoption of an e-health system that was comprehensive in terms of inclusion of information needed by key groups: physicians, diagnostic staff, researchers, insurance providers etc. The current e-health system still requires extensive paper-based recording and is largely limited to financial reporting as discussed further below.
- 2. The e-health system has supported improvements in resource allocation in the health sector.** As the system is integrated with the state register,

administrative staff and system operators can verify patient identity and track patient movements across facilities. This enables health care providers and private insurers to better manage patients who are beneficiaries of the benefits package. Given the clarity of patient flow, special requests to calculate patient enrollment are no longer needed, and resources follow the patients more efficiently. The yearly state budget allocation via the e-health system is also calculated automatically, and the system supports ongoing initiatives to reward facilities for performance. The capacity of the system to track patient movement has reduced the probability of fraud via claims for patients who were not served. Case duplication may still occur as discussed below.

3. Scale-up of the e-health system has presented financial, technical, and organizational challenges that have negative implications for the sustainability of the system, efficient health care delivery, and the system's ability to meet informational requirements for health decision-making.

- a) **Facilities face high recurrent expenditure to maintain the e-health system, as implementation requires a steady power supply, internet availability, licensed software, and administrative staff.** The subsidies for administrative costs provided by the State – 100% for Primary Health Care (PHC) facilities and 70% for hospitals – will be discontinued in 2019. The estimated average cost of power supply and internet to support implementation in each facility is one million AMD. These costs place a high financial burden on already-strained facilities and jeopardize the continued use of the e-health system.
- b) **The e-health system does not support the generation of epidemiological and service coverage data for health system performance management.** It was envisaged that the e-health system would integrate the different paper-based data collection systems for health data in Armenia. However, the health statistics on morbidity and mortality collected via the National Institute of Health (NIH) have not been integrated into the e-health system, and facilities continue to collect separate paper-based statistics. The e-health system also does not automatically generate facility-level indicators currently supported through results-based financing, such as the cervical cancer screening coverage.

- c) **The e-health system does not prevent case duplication.** Integration of the e-health system with the state register was to allow for unique individual identifiers and to prevent case duplication. However, there are technical problems with the linkages between databases, such that the e-health system does not control for double entries effectively. Thus, elimination of duplicate cases is done manually.
- d) **Health care providers perceive the skill and time requirements for implementing the e-health system as high and preventing efficient interactions with patients.** The scale-up of the e-health system has involved training for health facility staff on data entry and management, which will be completed in 2018. However, aptitude for learning these skills vary with age and prior use of technology. Aside from the initial training experience, there are no user manuals to support interaction with the e-health system. The e-health program requires up to 25 minutes to enter a single case and is time-consuming. Given these constraints, providers were more inclined to arrangements where a dedicated e-health system operator in the health facility supported entry of paper-based consultation data into the system, re-introducing inefficiencies in data collection.
- e) **The integrated e-health system is unable to provide the full range of functionality supported by the prior, decentralized electronic systems for hospitals and PHCs.** The prior systems focused solely on collecting data to support performance-based financing, aggregated from paper-based records (N001 and N002) filled by physicians and uploaded into the system by operators. Each entry took an average of 4 minutes. These decentralized systems automatically generated a set of reports on performance indicators and funds that informed decision-making in health facilities and by the State Health Agency. While the current e-health system allows providers to enter data encompassing the prior paper-based records, it does not automatically generate reports or identify errors in data entry. Thus, system operators, physicians, and financial administrators must manually fill in these gaps in data entry. There is still no provision to directly input patient history, examination, test results, and other management. Currently, paper-based records with this information is scanned to the patient's e-health entry.
- f) **Continuous interaction between the private operator coordinating the implementation the e-health system and users has informed improvements in functioning.** Users recognized that

negative implementation experiences presented opportunities to identify and correct system flaws. The private operator responded quickly to problems, and worked with facilities to identify potential solutions to bottlenecks. However, improvements were slow, in part because interactions between the private operator and health facilities were ad-hoc rather than systematic.

Conclusion

The Armenian experience of implementing an integrated health information system provides useful lessons for improving the functionality of the current system and for adopting technologies to improve health systems more generally. To encourage facilities to continue to use the e-health system, there is an immediate need for financial support for the associated recurrent costs for maintaining the e-health system and technical assistance, including training and user manuals, to guide everyday use by medical practitioners.

Several constraints to implementation could have been diagnosed before program launch or during the pilot, such as the lack of financial resources in facilities to support recurrent expenditure to maintain the system and the inefficiencies introduced into the provider-patient interaction by using the system. A systematic diagnostic of health system needs for the adoption of the technology would have assessed the requirements at the provider, facility, operator, and government level to fully implement an integrated health system. This diagnostic would also have explored potential behavioral constraints to adopting the technologies and informed a comprehensive approach to introducing the e-health system that addressed these constraints. Feedback from stakeholders illustrates the need to plan the sequencing of activities related to the adoption of similar technologies. For example, prerequisites for the adoption of e-health in facilities should have been addressed ahead of the national launch including training of all staff, ensuring the supply infrastructure needed for the e-health system, addressing staffing needs for system functioning, and development of user manuals and other guidelines.

Given the purposive sampling for this qualitative assessment, our findings may not reflect the universe of constraints to the e-health system use in Armenia, cannot account for the relative frequency of the identified constraints across all facilities, and may not be generalizable to the entire country. A systematic survey of e-health system implementation, using a randomly-selected sample or involving all facilities, is needed to fill these quantitative gaps.

There is broad recognition across stakeholders, that despite the difficulty in implementing the e-health system it can facilitate improvements in health system performance through providing information for research and decision-making. There are opportunities to iteratively adapt the e-health system in Armenia through a systematic assessment of the e-health system scale-up experience and through regular and structured interactions between the private operator of the e-health system, key stakeholders involved in the implementation of the e-health system, and policymakers that can facilitate the adoption of needed changes.

End Notes

¹ Jardim, Sandra V.B. 2013. "The Electronic Health Record and its Contribution to Healthcare Information Systems Interoperability." *Procedia Technology* 9 (2013): 940-948.

² EKENG. 2015. "E-health". Accessed at: <https://www.ekeng.am/en/ehealth/>

³ _____. 2015. "Pilot of the Armenian e-Health System Has Been Implemented". Accessed at: <https://www.ekeng.am/en/news/2015/12/23/Pilot%20of%20the%20Armenian%20e-Health%20System%20Has%20Been%20Implemented/3>.

⁴ World Bank Group. 2017. Implementation Completion and Results Report. Second Public-Sector Modernization Project. Report No: ICR00004207

⁵ Communication with Ministry of Health Representative.

This HNP Knowledge Note highlights the key findings from a rapid qualitative assessment by the World Bank of stakeholder perspectives on constraints to the implementation of the integrated health information system in Armenia.

The Health, Nutrition and Population Knowledge Briefs of the World Bank are a quick reference on the essentials of specific HNP-related topics summarizing new findings and information. These may highlight an issue and key interventions proven to be effective in improving health, or disseminate new findings and lessons learned from the regions. For more information on this topic, go to: www.worldbank.org/health.