THE FUTURE DEVELOPMENT OF DIGITAL HEALTH IN KAZAKHSTAN

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Summary: Digitalization is currently considered one of the most important instruments for the development of health care systems. At the same time, it requires significant efforts and inclusive measures coordinated at a national level. The current strategy on electronic health care development of the Republic of Kazakhstan forms a sustainable foundation for further development and offers a vision of the next steps for the national programme. Evaluation of results already achieved and future plans can contribute to the development of a consensus and recommendations for other countries to guide development of digital health services.

Keywords: Electronic Health, Health Digitalization, Standards, Information Model, Republic of Kazakhstan

The global context of health care digitalization

Digital data and digital processes have facilitated revolutions in all spheres of human existence by transforming not only familiar information exchange methods, but business-processes and even whole industries. Industry 4.0, which is characterised by the deep penetration of information and communication technologies, carries a number of risks, but also enormous expectations for societal transformation. In these conditions, the task of the government to help facilitate digital transformation encompasses developing the necessary environment to facilitate innovation, such as through the implementation of legislative reforms and generating timely responses to the challenges related to digitalization in all spheres, including health care.

The application of information and communication technologies (ICT) to health care began several decades ago; however, the rapid growth in technology implementation started after 2000. At the same time, the role and functions of eHealth have been continually redefined on the basis of accumulated knowledge and experience.

Case studies show that health ICT can:
1) increase the safety of medical care;
2) improve workflows by facilitating tasks such as medication reconciliation and by bringing decision support systems to the point of care;
3) reduce operating costs of clinical services;
4) reduce administrative costs;
5) achieve “transformation” of care by: effectively providing means to implement changes that are otherwise difficult, improving access to care (via telemedicine), improving chronic
care, multiple service delivery and care coordination, and improving feedback on the quality of care. When implementing transformative digital health projects, governments face a number of significant difficulties, such as the lack of legislation or regulatory base, lack of human, financial and technological resources, lack of unified standards, low quality of data and difficulty in linking data collected from different sources, among others. These challenges have become insurmountable obstacles in relation to the full application of ICT in some countries. This is particularly true where there is an absence of an inclusive national level strategic approach, which ensures the relevance of digitalization for all beneficiaries and encourages cooperative collective efforts to solving health care tasks.

The experience of electronic health care development in Kazakhstan

In the last decade, the Republic of Kazakhstan made a significant breakthrough in the field of health care informatisation by transitioning from ad hoc developments based on a “stimulus-reaction” principle to the subsequent implementation of a long-term strategic vision. In the framework of the National eHealth Development Strategy for 2013–2020, the focus shifted from the collection of analytic data, to the formation of an integrated information environment, which facilitates involvement and access to the necessary information for all major beneficiaries, including the population, health care and medicine providers, as well as management and financing bodies.

The first step to achieving this vision was identified as the formation of a favourable environment for the development and introduction of medical information systems that compete with each other (towards a decentralised and de-monopolised eHealth open market). Learning from international experience, regulation of the market for eHealth solutions was planned by forming a set of national and international standards, to enable the creation of an interoperable data model and integration mechanisms. The concept of national level Electronic Health Records (EHRs) was established as a practical implementation of standards and a tool for unification of not only information systems, data and the flow of information, but all health care actors, including the patients themselves.

Strategy implementation required significant institutional reforms. Following the principle of inclusive development, the Ministry of Healthcare of the Republic of Kazakhstan rejected their informatisation monopoly and concentrated efforts on policy development, regulation and standardisation, ensuring the development and implementation of integrated mechanisms at the national level, including the development of systems and services for health care management and financing. Separate structures and organisations for the implementation of different aspects of informatisation – from the introduction of standards to management of projects at the national level were created. The necessary legislative and regulatory bases were formed and national registers and integrated services, which are the enablers of a unified information space for the health care system, were developed. The introduction of national services, like ePrescriptions and eReferrals for planned hospitalisation, was ensured.

The implementation of medical (hospital) information systems in all medical organisations of the country was ensured on a local level. The process of shifting to paperless medical data with fully digitized patient records was initiated. Services and mobile applications for patients were actively introduced. The network of telemedicine that allows patients from distant rural areas to access consultations with specialists from large regional and national medical centres was deployed.

Despite considerable progress, a number of challenges in developing digital health solutions in Kazakhstan remain, many of which are being experienced by other countries. Health and health care data collected in electronic form are still fragmented. At the local level, clinical data are limited within the frames of a specific medical organisation, or several organisations which use the same information system with a single database. At the national level, analytic data are distributed between different databases, including disease-specific registers, as well as databases of national services for ePrescriptions and eReferrals. This in turn causes problems with the verification of data and difficulties with data linkage that prevents deeper analysis of health care processes and performance.

Moreover, despite the first steps towards the digitalization of medical information, paper forms are still the primary tool used to capture medical data. Clearly, even after digitalization of health care data is achieved for medical centres (e.g. achieving paperless hospitals and polyclinics), the next stage of development – a paperless health care system – will require additional tools, resources and time.

Future development

The current national strategy’s aim is to create a complex, integrated informational infrastructure that provides all health care actors, including the patient, with all necessary medical and administrative information. However, despite understanding the significant role of ICT in health care, ICT within the framework of the current strategy is assigned a passive, supportive role. At the same time, the contemporary paradigm of digitalization implies the application of digital technologies to change existing processes and models of care and provide new opportunities for achieving goals and getting value. Within the framework of digitalization, ICT plays the role of proactive tools and is the driver of qualitative transformation.

These challenges necessitate the development of a new vision that establishes new long-term objectives and tasks. Within any new vision it is important that the Kazakhstani strategic approach towards informatisation maintains systematic complex development. While the infrastructure for collecting digital medical data has been created, the next stage will require the development of infrastructure with the purpose of ensuring the functions of sharing and advancing the application and use of data.

In the short-term, the development of an integrated platform at the national level which helps to integrate local and regional

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medical information systems is planned. The platform contains instruments and services that ensure interoperability through the application of the unified set of registers and classifiers across the whole space of digital health care. This includes an EHR repository; storage of analytic data with the instruments of Business Intelligence, and a portal for patients.

It is expected that after the implementation of the Platform in 2020, national level EHRs will become a central source of verified data to support clinical and political decision-making. An informational model of EHRs, built on the principles of standard ISO 13940:2015 “Health informatics-System of concepts to support continuity of care”[3] will become the core of an informational model of the whole care provision system and a starting point to facilitate the move towards a paperless health care system.

By functioning as a central element of interoperability, and hence comprehensive support of patient-centred care, EHRs will provide clinically relevant information to all permitted individuals as and when needed. The capture of key data about the patient’s health according to the information model standards will provide all participants involved in the organisation and provision of care with a minimum set of information that ensures the highest possible level of knowledge about public health, utilisation of health resources, monitoring of care, patient’s care management and interactions between involved parties.

Another long-term goal is to digitalize the patient’s route through the health care system. Its achievement requires the full interoperability of all health information systems and resources. This will provide clinical decision-making in real time at all levels of care. It means reducing barriers between levels of care or to health care facilities, as well as coordination of the patient’s route in outpatient and inpatient settings by Primary Health Care doctors aimed at the prevention or management of chronic diseases. Such a unified, integrated patient route is monitored through recommendations provided by clinical guidelines and ensures efficient and effective use of health care resources. The final result of this goal is to support seamless care, meaning timely, predetermined, planned and automated transfer of activities and information from one health care provider to another based on programmes and plans of care. A fully interoperable digital health ecosystem should be created at this stage, including, in addition to national and subnational level information systems, telehealth and mobile health devices and tools.

Digitalization of both clinical processes and patient routes requires the development and implementation of a new digital method of data collection. All health and health care data must be collected and exchanged not just in digital form, but with the observance of the principles of support for the evolving clinical context. A unified data collection policy will need to cover all clinical data needs for all possible uses without the need for subjective interpretation. This means that any digital record must contain primarily machine-readable data that can be processed and interpreted by a computer.

In addition to the digital data access tools described above, technologies will be introduced that support clinical and policymaking decisions regarding the health of the individual, groups of people, and the population as a whole. Innovative data processing technologies will be used to search for patterns, correlations, and cause-effect relationships in relation to public health, personalised medicine and the effectiveness of the health care system.

Conclusion

Despite the many examples of successful implementation of individual technologies, the complex digitalization of health care systems is a challenge which has not yet been solved by any country. Based on rising expectations and growth in expenditure for ICT, the World Health Organization pays particular attention to the lack of a systematic approach to monitoring and evaluating national health system digitalization programmes. In the absence of generally accepted techniques for the evaluation of digitalization results, developing procedures to estimate the clinical and economic effectiveness of ICT should become one of the main priorities for national strategies.

The accumulated experience of Kazakhstan demonstrates the importance of developing a strategic approach and ensuring the sustainability of results in an environment where the pace of development and obsolescence of technology is constantly increasing. To achieve sustainability, one must create a favourable environment, develop an institutional framework and provide investment in standards, data and use-cases, rather than in a particular informational system or technology.

References