
ELECTRONIC HEALTH RECORDS IN THE UNITED STATES AND RUSSIA: CHALLENGES AND OPPORTUNITIES FOR COLLABORATIVE LEADERSHIP

IV. Healthcare Working Group

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Abstract

Electronic health records (EHRs) have emerged as a technological solution to facilitate the continuity of care and to improve population health. Despite the promise to aid physicians and patients, efforts since 2009 to widely implement EHRs in United States healthcare systems have faced significant barriers, which have revealed the need for a different approach. Russia has a much less storied history with EHR, but Minister of Health of the Russian Federation, Veronika Skvortsova, recently announced the Ministry's aim to universalize EHR access to improve patient care. Considering the robust opportunity for bilateral collaboration to achieve better healthcare, we evaluate the similarities and differences in EHR use between the two nations and use a comparative approach to identify growth opportunities in each country. We suggest two main practices that can augment the partnership: (1) the equitable valuation for, and open sharing of, best practices in public-private relationship management, including resource allocation, method regulation, and the financial support of businesses; (2) a science and technology transfer that can foster the adoption of EHRs, which can directly help patients as system benefactors. Healthcare is an area that both the US and Russia value greatly, and we argue that collaboration can relax currently-tense bilateral relations and set the stage for further partnership in the future.

INTRODUCTION

Healthcare is one of the few areas in which international cooperation does not require extrinsic motivation. The United States and Russia share an interest in improving health provisions for their citizens, but more notably, collaboration on healthcare between the two nations can help to 'thaw' the currently frosty bilateral relationship. As such, collaboration in healthcare may catalyze further productive efforts to address global challenges. One promising realm for collaborative leadership in healthcare involves the novel developments in information technology (IT). IT has become the principal vehicle for supporting clinical decision making, healthcare delivery, and patient engagement (Daglish and Archer 2009). Healthcare information technology, especially electronic health records (EHRs), have the

potential to serve as partial solutions to existing healthcare problems in each nation.

An EHR is a longitudinal collection of patient health information stored on an electronic platform, which can be shared across healthcare settings via the network-connected enterprise-wide information system. Such patient records may include demographics, medical history, medication and allergies, immunization records, laboratory test results, radiology images, and billing information. The use of EHR systems has been shown to increase physician efficiency and decrease human error, ease physical storage requirements, reduce costs of care, promote evidence-based medicine, and improve the overall quality of care (Yina 2010; Fernández-Alemán et al. 2013). Indeed, the use of EHRs empowers patients and transforms them from passive recipients of services to active participants in informed decision-making (Daglish and Archer 2009). Moreover, the utility of such technology — strengthened by smart-sensor systems — is not restricted to therapeutic purposes, but can also reveal trends and be used for predictive medicine.

Existing means of data collection can and will need to be revised to capitalize on the technological potential of modern sensors (Ilyas 2008). Neither Russia nor the United States

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have devised how to take full advantage of advancing EHR capabilities, and robust use of EHR represents an opportunity for collaborative leadership between these countries. Taking into consideration the differences in Russia and the United States' healthcare systems, and in the accumulated experience among the two states in the adoption of EHRs, there is room for collaboration in addressing common issues as well as overcoming shared difficulties. This study aims to evaluate the similarities and differences between healthcare infrastructure in the two nations, to use a comparative approach to identify deficiencies in each approach, and to suggest potential areas for bilateral collaboration to address outstanding issues.

ENDURING ISSUES REGARDING THE ADOPTION OF EHRs IN THE US AND RUSSIA

Adoption of EHRs in the US

Although EHR is not a new technology in the US, its adoption by clinicians has been slow over recent decades. The 2009 passage of the Health Information Technology for Economic and Clinical Health (HI-TECH) Act offered system purchase subsidies and reimbursement incentives through Medicare and Medicaid to increase the prevalence of "meaningful use" (Middleton et al. 2013). It rewarded clinicians who took the initiative to purchase EHR systems and penalized physicians who submitted Medicare claims using paper documentation. The program also contained provisions to promote patient interaction with their own medical records, health information exchange among clinicians, and stricter enforcement of medical information privacy laws. A survey by the US Department for Health and Human Services revealed that the number of office physicians using EHR systems increased from 57% to 87% during the 2011-2015 period. While the decentralized nature of the healthcare practice makes it challenging to evaluate the proportion of patients who benefit from an EHR, as of 2016, 96% of hospitals in the United States adopted a federally tested and certified EHR program — a ninefold increase since 2008 (Reisman 2017). The adoption of EHRs incentivizes the substitution of electronic for paper-based records, enhances patient documentation, optimizes billing practices, and generates a data repository (Boonstra and Broekhuis 2010).

The growing adoption of EHR systems has been accompanied by a heightened recognition of the issues related to using EHR systems. Some EHR users lament that health IT appears designed for clinical transactions, instead of for clinical care. In addition, many EHR systems require extensive training, while the lack of a standard user interface means clinicians who work in multiple care settings with disparate technologies may struggle with the differences in interface design and have an adverse impact on patient safety (Middleton et al. 2013; Babbott et al. 2014). Amidst legislative attempts to prompt the widespread adoption of EHR systems, the US continues to face barriers to meaningful use: non-communicability between platforms from different companies, the privacy of shared information, and the cost of financial implementation. Despite clear progress in the adoption of EHRs in the US, the nation still faces many

challenges associated with the efficient and productive use of the technology.

Adoption of EHRs in Russia

For many years, healthcare was highly centralized in Russia (Gordeev, Pavlova, and Groot 2011), and public funding of the healthcare system in Russia — even if historically mismanaged — remains far greater than in the United States (Young and Chatwood 2011). However, medical care quality in Russia depends heavily on urban-rural divides and a physician's own education, tenets, and professional experiences (Taranik and Kopanitsa 2017). Variation in styles of practice make it even more urgent that EHR is widely adopted in order to facilitate case-based reasoning in decision support systems. The Russian EHR market is maturing alongside the health care system with a compound annual growth rate of 10-14% since 2009 (Parikh 2015). Large private suppliers have entered the Russian EHR market to provide rapid EHR data exchange and unified access to health care data, while also helping medical institutions to meet secure information requirements. For example, in 2011, IBM introduced its Lotus platform, an EHR platform designed for use by Russian clinicians. This was touted as the maiden foray of an American company into the Russian EHR market, and IBM Lotus now serves nine hospitals in Russia (Parikh 2015). When IBM announced their Lotus Notes launch, the effort was intended not only to digitize patient records, but also automate hospital processes.

While several review articles summarize the growing body of literature regarding US challenges in EHR adoption, relatively few exist which describe challenges and guiding solutions for Russian EHR initiatives. Common issues, including a lack of economic incentives and technical expertise to implement and use EHRs, appear as major barriers to EHR adoption in Russia. Others brought up when Russia was a part of the Soviet Union tend not to trust diagnostics and treatments unless they are printed out on paper — perhaps attributable to a generational divide —, which poses a cultural obstacle to widespread patient engagement with their electronic patient information. Similar to the situation described in the US, the high costs of EHR installation pose a major barrier to Russian medical practices.

Although problems remain to be tackled, the prevalence of EHR use in Russia continues to grow steadily (Moore 2011). Russia declared its intent last year to expand EHR use in its healthcare sector, and the US' relevant experiences should be valuable for Russia to avoid similar mistakes.

Common Puzzling Issues with the Adoption of EHRs

The US and Russia each aim to leverage new technology and improve healthcare provisions, and each country recognizes the importance of EHRs. However, their efforts are associated with numerous challenges. Despite historical, economic, political, and cultural differences, there are common issues between both countries regarding the adoption of EHRs. So far both systems implement the use of EHR reactively — for the sick — instead of proactively, for prevention and wellness. Both systems are also challenged by fragmentation and inefficiencies that increase the cost burden on their

respective economies and create disparities in access to quality care. And both must educate their populations and incentivize physicians and hospitals to focus on prevention and wellness.

The disparity in published research highlights the potential for bilateral collaboration and mutual growth. The US' history of EHR adoption and technical knowledge can help to aid Russia's adoption. On the other hand, Russian officials are considering the use of novel technological solutions, such as blockchain integration, to facilitate effective EHR use; the new experiences of Russia will be useful to solve persistent issues with EHR systems in the US. In order to address these issues, we propose strengthened international collaboration and experience exchange on the subject, to the benefit of both parties.

COLLABORATIVE LEADERSHIP WILL EXPEDITE THE BILATERAL ADOPTION OF EHRs AND ENHANCE THEIR EFFICACY

US-Russia Collaboration in Healthcare has Historically Proven to be Successful

During, and in the years following, the Cold War, healthcare has been a fruitful area of collaboration between United States and Russia. Smallpox eradication and the widespread use of the Sabin polio vaccine are two key examples of this productive relationship (Rojansky and Tabarovsky 2013). Throughout the late 20th century, joint US-Soviet or US-Russian health activities continued, with a major focus on HIV/AIDS prevention, as well as the prevention of other sexually transmitted diseases and tuberculosis (TB) (Hotez 2017). Today, issues varying from fighting pandemic threats to overcoming many other problems related to healthcare require access to substantial patient data pools. These examples illustrate that the US and Russia have aligned interests in healthcare and that these countries have the capacity to work together in addressing healthcare challenges. Hostilities between the United States and Russia may be nowhere near confrontations during the 1960s and 1970s, but extraordinary opportunities remain to meld our scientific activities to eliminate the world's major neglected and emerging diseases, thereby overcoming geopolitical tensions (Hotez 2017). We seek to explore and analyze best historical practices of bilateral collaboration and how they can be applied for EHR adoption in the present.

The United States is More Experienced with EHR Adoption

The United States is a leader in the healthcare industry, as well as in various other innovative sectors. Indeed, the US healthcare market accounts for one-sixth of global healthcare spending (Carroll and Frakt 2017). Nevertheless, in a survey reported by Babbot et al., physicians report stress, dissatisfaction, burnout, and extensive time pressure during visits (2014). In their survey responses, these problems appeared across the urban-rural divide, from physicians in inner-city clinics in New York and Chicago, managed care clinics in mid-sized cities like Milwaukee and Madison, Wisconsin, and small rural clinics in central Wisconsin (Babbot et al. 2014). To mitigate these negative effects, it seems rea-

sonable to account for physicians' workload and varying cognitive abilities while implementing EHRs (Babbott et al. 2014).

Russia's Private Healthcare Sector is a Growing Market Open to New EHR Opportunities

The Russian healthcare market — particularly in the areas of prescription drugs and medical devices — skyrocketed in recent years, reaching over \$30 billion USD (Twigg 2014). The "IT in Healthcare 2016" report by the Russian information agency CNews indicated that the overall profit by the private health IT providers was 2.2 billion rubles in 2015, which is nine percent more than in 2014 (Rudicheva 2016).

By the end of 2018, 40 percent of the population of the Russian Federation will hold EHRs, as was announced by Prime Minister Dmitry Medvedev and Minister of Health Veronika Skvortsova (Bugrim 2017). With regard to personal data protection, however, EHRs pose certain threat, as far as Roskomnadzor, the Federal Service for the Supervision of Communications, is concerned (Islamova n.d.) As for the Tyumen region, EHRs were allegedly implemented in all hospitals in 2017 (Federation Council 2017). Dmitry Medvedev also approved 5.62 billion rubles to improve medical care using technological tools through 2025 (Pakhomov n.d.) This characterizes the Russian EHR market as growing and changing rapidly, which indicates possible opportunities for adopting new approaches and best practices from established markets.

Employees of the Regional Hospital #1 in Tyumen, Russia claim that there are many legislative barriers to fully implementing EHRs (Personal Communication 2017). Obstacles still exist in the form of signatures and formal agreements for treatments, required in hard copy. In addition, medical staff must be trained to utilize EHRs. Moreover, the local government has employed private contractors to build out IT infrastructure, essential for diverging to EHRs. For example, the blood test laboratory is connected to other hospitals in Tyumen region and allows for the storage and electronic transfer of patient data. Experts from Tyumen point out the fact that there is no interregional compatible framework that would allow for having access to patient records from outside of Tyumen region (Personal Communication 2017). Several start-ups exist that look for technical solutions in this field that can be potentially supported by the local administration. It is important to note that Tyumen is a particularly wealthy and technologically-advanced oblast, and the investment and educational opportunities available in Tyumen are not necessarily representative of the country, as a whole.

Public-Private Partnership is Still Growing in Russian Healthcare

Despite unfavorable economic conditions, private-public partnerships (PPP) are expected to expand in Russia. Private investment aimed at PPP in healthcare sector currently comprises ten percent of total spending in this sector. For instance, at the Sochi-2017 Russian Investment Forum, agreement has been reached with regard to constructing the Leningrad Regional Centre for Medical Rehabilitation in the

Gatchina region. Long-term benefits, like those posed by the new institution, are essential for PPP investment projects to be appealing for investors (Samsonova 2017). If we can expect low inflation, we find potential for PPP investments in Russian healthcare, in general, and in development of EHRs, in particular.

Executive Summary of Suggested Mechanisms for Potential Solutions

Although historical, economic, social, financial, and cultural differences on the healthcare business markets between the two countries present many obstacles, they also provide opportunities to leverage two histories so that each country can learn from the experiences of the other. For example, the US-established business models in healthcare may serve as tested examples of public-private cooperation, while Russia's private healthcare sector can model a dynamic and adaptive market that is successful with less competition, fewer regulations, and a faster translation of ideas to patient delivery. In this respect, the US experienced quite a few obstacles in EHR implementation related to over-reaching governmental control. Therefore, a business environment should be taken into consideration when developing EHRs in Russia.

To accelerate adoption of state-of-the-art EHR practices and ensure quality of implementation, the government must stimulate the involvement of entrepreneurs and established businesses, balance regulation and stimulation in its private sector partnerships, and encourage close international cooperation between the US and Russia in knowledge transfer. We suggest two ways to drive the effective partnership: (1) the equitable valuation for, and open sharing of, best practices in public-private relationship management, including resource allocation, method regulation, and the financial support of businesses; (2) a science and technology transfer that can foster the adoption of EHRs, which can directly help patients as system benefactors.

Such mutual learning between the US and Russia will accelerate development and the adoption of best practices in healthcare IT. Sharing best public-private partnerships practices will enable the involvement of entrepreneurs in still-developing markets, supporting the growth of the healthcare sectors. With a population of over 450 million people living in the two countries combined, collaboration promises an enormous potential to affect lives. From a broader perspective, severing contact on such an obvious shared interest as healthcare, where professionals share common interests and motivations beyond political habits of cooperation, could prove highly desirable for the re-establishment of positive bilateral ties between the two nations (Twigg 2014). We further determine that collaboration on EHRs will lead to substantial improvements in the healthcare business markets of both countries, which in the end will benefit governments, physicians, and, most importantly, patients.

CONCLUSIONS

Russia's healthcare reforms and efforts to penetrate the EHR space present an opportunity for the US to partner with Russia and to raise the standard of healthcare information

technology. Authentic collaborative leadership would spark meaningful healthcare progress for the people of both nations, while also providing models for a successful EHR rollout in other health systems around the globe. The US placed full government support behind EHR expansion in 2009 and thus has greater technical experience with EHR implementation than Russia does. However, the current state of EHR in the US leaves much to be desired, with problems stemming from lack of interoperability, non-adoption, and regional disparities. Russia can serve as a locale for a novel approach, one that can potentially turn around and improve EHR usage in the US.

Considering current tensions in bilateral relations, any chance for sustainable co-leadership requires that the US take care to avoid any 'white-knight' overtures. This means that the US cannot view collaboration as a donor-recipient relationship and must equally value opportunities to learn from Russia's EHR experience. Russia has increasingly pushed to re-brand itself as a global hegemon, and its challenges to Western countries' soft power has further strained US-Russia relations. However, successful collaboration on EHR development could 'reset' relations, simultaneously improving diplomatic relations and healthcare outcomes. Productive relations may even lead to larger US-Russia partner initiatives to address other global issues, whether through bilateral engagement or multilateral initiatives.

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