ARE THERE JUST BARRIERS? INSTITUTIONAL PERSPECTIVE ON THE DEVELOPMENT OF E-HEALTH IN POLAND

MARCIN KAUTSCH, MATEUSZ LICHOŃ, NATALIA MATUSZAK, JONATHAN ERSKINE, MALCOLM WHITFIELD

ABSTRACT

Development of e-health in Poland has suffered from multiple setbacks and delays. This paper presents views on and experiences with implementation of e-health solutions of three groups of respondents: buyers, suppliers and external experts with the aim of establishing to what extent and in what way e-health development was taking place in Polish public health care and if there were any national policy targets or European targets influencing this development. It is based on desktop studies and interviews conducted in Poland in the spring and summer of 2015. The interviews largely confirmed findings from the desktop study: legal obstacles were the decisive factor hindering the development of e-health, especially telemedicine, with extensive insufficiency of basic IT infrastructure closely following. Stakeholders were deterred from engaging with telemedicine, and from procuring e-health using non-standard procedures, from fear of legal liability. Some doctor's resistance to e-health was also noted. There are reasons for optimism. Amendment to the Act on the System of Information in Health Care removed most legal obstacles to e-health. The Polish national payer (NFZ) has started introducing reimbursement for remote services, though it is still too early see results of these changes. Some doctors' reluctance to telemedicine may change due to demographic changes in this professional group, younger generations may regard ICT-based solutions as a norm. In the same time, poor development of basic IT infrastructure in Polish hospitals is likely to persist, unless a national programme of e-health development is implemented (with funds secured) and contracting e-health services by NFZ is introduced on a larger scale.

KEY WORDS
barriers, eHealth, Poland, telemedicine

DOI: 10.1515/emj-2017-0015

Corresponding author:

Marcin Kautsch

Jagiellonian University Medical College,
Institute of Public Health,
Krakow, Poland
e-mail: mxkautsc@wp.pl

Mateusz Lichoń

Jagiellonian University, Sociology
Institute, Krakow, Poland
e-mail: mateusz.lichon@gmail.com

Natalia Matuszak

Dane-i-Analizy.pl sp. z o.o.,
Krakow, Poland
e-mail: natalia.matuszak@gmail.com

Jonathan Erskine

Durham University, School of Medicine,
Pharmacy and Health, Durham, UK
e-mail: jonathan.erskine@
durham.ac.uk

Malcolm Whitfield

Emeritus Professor, Sheffield Hallam
University, Sheffield, UK
e-mail: malcolm.whitfield@aol.co.uk

INTRODUCTION

This article derives from desktop study research and interviews carried out in the initial phase of the project: European Procurers Platform — eHealth — Transforming the market for eHealth Solutions. The goal of the project was to investigate and compare current developments in e-health in selected member states (Denmark, Poland and Spain) with a focus on barriers, opportunities and case studies. The aim of this paper is to establish to what extent and in what way e-health development was taking place in Polish public health care and if there were any national policy targets or European targets influencing this development.

ICT solutions have been playing an increasingly prominent role in how health care systems deliver

services and how they organise their internal work (Iakovidis, Wilson & Healy, 2004). E-health has been promoted by the European Commission (EC) (2013, 2014), because of its assumed potential for alleviating some of the public health problems that the European Union (EU) struggles with: growing burden of chronic and civilisation diseases, ageing. All of them are associated with rising costs of treatment and care, and shortages of the medical staff, and which the EC hopes to reduce with the help of the technology (Bell & Thornton, 2011; Kumar & Bauer, 2011). The value of the global e-health market was estimated at $2.2 billion in 2015, and its projected growth to $6.5 billion by 2020 by some sources (MarketsandMarkets, 2015), or even to €17.6 billion by 2017 by others (European Commission, 2015).

The term e-health (e-zdrowie in Polish) is widely used in official documents such as legal acts, bills or reports. However, its definition is nowhere to be found as far as Polish sources are concerned, and definitions used in European Commission's communicates are presumed. Judging from the national documents on the subject (Ministerstwo Rozwoju Regionalnego, 2012; Ministerstwo Zdrowia, 2009), policy makers connect it mainly to medical information systems (registration, databases and so on), giving little attention to clinical services delivery with the help of ICT. While the European Commission considers telemedicine a subcategory of e-health, in Poland it is usually understood to be a separate category. Consequently, services such as telecare, teleconsultation, telemonitoring are classified under telemedicine, while e-prescriptions and e-referrals fall under e-health (European Commission, 2004). To avoid the confusion, in this article we will use the broad understanding of e-health that includes using information and communications technology (ICT) in health care (eHealth Policy).

1. RESEARCH METHOD

The desktop research was conducted from February to May 2015. It involved a literature review and a secondary analysis of documents relevant to the topic. It was aimed to identify Polish e-health policy targets and their relationship with European targets, definition of e-health used in national documents, national laws regulating e-health and national plans for its future development (including targets and strategies, authors and public authorities that support

it and foreseen timeframes), key barriers and opportunities for its development. It was also set to assess the size of e-health market in Poland and provide successful and unsuccessful case studies of e-health implementation. From an institutional perspective, it included all Polish legal acts regarding e-health, Ministry of Health strategies for informatization and development of e-health, Supreme Audit Office reports on healthcare informatization and European Commission's e-health Actions Plans. This data was supplemented with scientific and lay articles regarding the topic of e-health. An emphasis was put on cross-checking opinions and facts to paint a complete and coherent picture of e-health development. This research stage served as a basis for the next one, a qualitative study, in which a series of structured interviews was carried out from June to September 2015. The interview questions were developed basing on the findings of desktop research and were designed to provide a deeper and more practical perspective on the e-health situation in Poland as well as to verify it against stakeholders' personal experience. With that in mind, the interview scenario included (but was not limited to) questions regarding subjective understanding of e-health, typical and innovative e-health solutions, motivations for its development, healthcare sectors that could benefit the most from it, social and political changes that influenced it in the past years as well as perception of its future. To comprehensively evaluate market perspective, the research included stakeholders representing buyers and suppliers as well as experts – people with considerable knowledge regarding e-health market in Poland but not directly involved in it. The sample was gathered through convenience sampling. There were 4 experts (including an academic professor, a journalist, an expert-consultant in one of the major Polish NGO and a member of a consultancy agency), 6 buyers (representatives of various Polish healthcare facilities) and 4 suppliers (including a deputy CEO's and three head of departments in Polish companies providing e-health solutions) from Poland interviewed. The conversations were conducted by the phone or Skype, recorded, and later transcribed. Interviews' transcripts were coded during the analysis stage of the research using Atlas.ti software. A code book was developed and used throughout the analysis process. It was initially prepared based on the desktop study as first codes were identified through deduction process basing on the findings from the literature review and secondary analysis. Subsequently, the codes were further refined through induction, following a the-

matic analysis (TA) of the interview transcripts, to comprise new themes that were previously uncovered. Eventually, the codebook consisted of 77 codes that were used to analyse the interviews. Once the transcripts were coded, the relationships between particular codes were identified and described. Firstly, analytical efforts focused on the semantic level of the material. Only reoccurring themes were subject to more interpretive, higher level, analysis. An essentialist approach was balanced by elements of constructionism (Braun & Clarke, 2006). The codes, their content corresponding with the coded quotations and their relationships between each other were then used to describe the findings of the research, presented in this article.

The findings of the desktop study provided a background, against which the information obtained from the interviews was compared. The desktop study results provided a context and helped saturate the interviews with meaning. The latter complemented the former, painting a multi-dimensional picture of mechanisms underlying public procurement of e-health, and various barriers encountered by stakeholders in the process. As previously mentioned, the EPP Project investigated four countries, but this article concentrates exclusively on Poland.

2. Research results of the literature search and the interviews[1]

The literature search and the interviews from all stakeholder groups showed multiple challenges to e-health implementation in Poland, with legal ones undoubtedly being invoked most often and presented as the decisive ones

2.1. Legal barriers

The legislation was the single barrier to procurement and implementation of e-health solutions

mentioned by all of the interviewees regardless of stakeholder group they represented. The precarious legal status of telemedicine was most often cited as an example, with some of the interviewees (especially suppliers), admitting to waiting for the moment when they would be able to offer ICT-based services. For that to happen, legislation and policies they see as hindering the development of e-health would have to change.

Failure of the national payer to reimburse e-health services was quoted as another barrier to e-health development. Very few e-health services could be performed by health care units (like the remote interpretation of radiological imaging; see below) without being questioned by the NFZ. (E-health solutions for administration, for example, e-registration, electronic health records (EHR) are not regulated by the NFZ, but bring their own problems).

With telemedicine becoming legal at the end of 2015 (after the interviews were conducted), and with the NFZ having launched multiple telemedicine pilots (mainly in psychiatry, geriatrics and cardiology) (TVP.info, 2015), and moving towards routine contracts for telemedical services (NFZ, 2015; Król, 2015), there seem to be some reasons for optimism.

All the interviewees perceive the legal framework as a major barrier to e-health procurement and implementation. Buyers particularly feel frustrated by uncertainty. Deadlines for the introduction of the EHR systems had been postponed several times due to delays in e-health projects managed by a government agency set up especially for computerisation of the healthcare system (CSIOZ), but the framework should be functioning in 2017, so the hospitals must be prepared for it. Although the legal framework is now in place, compatible solutions and proper infrastructure are still lacking. One of the buyers complained that they had been prevented from launching e-consultation services they piloted because of the law in force at the time. Suppliers were also aware of the barriers created by the lack of appropriate legislation:

"As long as telemedicine services are not [recognised], no-one will be able to purchase them. They will buy them only as an attraction, something of a pilot." (Supplier 3)

One of the interviewees expressed fears resulting from the precarious legal status of this branch of e-health even more clearly, relating telemedicine directly to a danger of prosecution.

---

[1] The results of the study are shown in this paper in a slightly different way to the one that is commonly used. The authors decided to present both literature search and interviews in the same sections. This allows the literature search results to be checked against the opinions of the interviewees. As it can be seen in the paper, the interviewees agreed with what was found during the desktop research and provided some additional explanation or an angle to the mentioned results.

2.1.1. Barriers to remote consultations

The need to examine a patient in person remains important for physicians and, up until recently, an obligation to do so was written into the law: Professions of Physician and Dentist Act. The act was amended simultaneously with the Act on the System of Information in Health Care when the obligation was removed. Similarly, the legal requirement of a handwritten signature on a prescription hindered government's pilot e-prescription project (Ministerstwo Zdrowia, 2012). This requirement has been lifted only for chronically ill patients. The inadequate legislation was quoted as the main obstacle to e-health development by Adamski (2014) in a report for the European Commission, with substantial delays in central government's projects closely following.

2.1.2. Challenges related to data transfer and storing

Some stakeholders expressed frustration at the thought that they could not incorporate technologies that have redefined many other business sectors into their e-health solutions.

"[...] one barrier today are [...] regulations that practically make it impossible or hardly possible to use cloud-based solutions. [...] Because, correspondence, an exchange of views is going on between the Health Ministry and GIODO [Polish data protection agency]. On this topic exactly. It's like, I don't know if it makes sense to go into such details. It's not a problem with personal data protection, but rather with outdated regulations, that are included in this law, about the doctor and the pharmacist... [...] and there are such regulations that imply that generally everything that is exchanged between a doctor and a patient in the privacy of the physician's office, is for their information only, and this information can be shared in concrete, predetermined circumstances." (Supplier 1)

In theory, at least, the above-mentioned amendment of the Act on the System of Information in Health Care (Ustawa..., 2015) from November 2015 opened the door to innovation. It permitted electronic data storage and processing services to be outsourced by health care units. Moreover, it states that technical specialists responsible for the maintenance of an e-health system have a right to access EHRs, but are automatically bound by "professional secrecy".

In practice, however, in the traditional paper-based system that still dominates, patient's consent (signature) is regularly required for various treatment activities, including health data transfer. Moreover, the safety of the personal data of patients has been examined and called into question more often than ever. A national EHR has not been introduced in Poland yet (December 2016). There are functioning regional solutions (usually hospital patient records that are not shared between institutions), and basic e-health solutions like e-registration are quite common (Bartczak & Barańska, 2015; Karlińska, 2014). Protection measures currently used by some hospitals have been criticised by the press (Klinger & Janczura, 2016), as has inaction on the part of the Polish data protection agency, GIODO. Similarly, the pilot introduction of e-prescription was subjected to harsh critique due to the perceived failure of data protection measures (TOK FM/rynekaptek.pl, 2015). In Poland, unlike many other EU countries (EU Health Programme, 2014), patients own their medical data and have a right (so far prospective) to withhold any piece of information from medical specialists in the planned EHR. This arrangement was upheld by an amendment to the Act on the System of Information in Health Care (Ustawa..., 2015) that directly regulates e-health and telemedicine. (Hospital EHR systems do not have this functionality). No information regarding planned secondary uses (academic or commercial research, medical statistics) was found.

The government needs to perform a difficult balancing act between allowing the health care system to benefit from what e-health has to offer to ensure the safety of the citizens' most sensitive data.

What is more, exceptional (compared to other branches of e-health) development of teleradiology through increased use of remote services suggests that when the will and opportunity are there, e-health can develop. Radiology is unique in that the patient and the radiologist do not have to meet at all for most of the routine services (interpretation of imaging). Because of this, using the internet for communication between a hospital and a radiologist has not caused much controversy. An interviewee explained the mechanism:

"[...] However, teleradiological services still operate outside the law, right. [...] Not in accordance with the current law. There are some 'legal tricks' that they make use of, and that's why it works. Since a radiologist mainly describes radiograms or results of MRI or CT or imaging. Thanks to that, it is a bit easier of a task, since such pictures are easily sent by an IT network. [...] So, teleradiology has developed mainly because there's an ever-growing need for radiologists." (Buyer 1)

This case suggests that, on the one hand, services based on ICT can be achieved even in a seemingly unfriendly technological and legal environment. On the other hand, there is no reliable data on how patient information safety standards are enforced in such arrangements. This leaves the open the question of whether teleradiology "by the book" is actually possible in the current circumstances.

2.2. Fragmentation and resulting lack of interoperability

Interestingly, despite obvious delays and failures of the law-making in the area of e-health, some interviewees think that interoperability and other standards for e-health solutions should be set by the law:

"...if I were Health Minister, I would introduce something like that [guidelines for e-health solutions]. If we have sets of guidelines for financial and accounting system, you know. If we have a set of requirements that must be met by a payroll system, then why on Earth shouldn't there be a set of requirements that must be met by a medical system? Is it any worse? NO!" (Supplier 2)

2.3. Infrastructure

An often-mentioned barrier, especially by suppliers and those buyers who worked as hospital system administrators, was a lack of appropriate IT infrastructure, on which e-health solutions of any kind could run.

"What will be the use of software bought by a health care unit, if it doesn't have the equipment. [...] Clearly, this the biggest the biggest problem, I guess." (Buyer 2)

Yet, finding money to buy and maintain the said infrastructure proves difficult for underfunded hospitals, and is simply not a priority. In the absence of a coherent, long-term national financing policy for healthcare computerisation, let alone e-health, EU funds often prove to be a source of capital, on which the pace of ICT implementation in public hospitals depends (Karlińska, Masiarz & Mężyk, 2014). Indeed, buyers cite an opportunity for acquiring EU funds as an important motivation for starting an e-health project at a particular moment, and at a particular cost. This approach to decision-making may be interpreted as yet another symptom of a dramatic underdevelopment of IT infrastructure. The issue of basic infrastructure such as computers, servers, Internet connection was brought up repeatedly by all groups. It is quoted as the biggest obstacle (apart from the legal ones) to implementing even basic e-health solutions.

"I think we hadn't been aware of just how important hardware is. [...] In the first place, we got ourselves a computer network. Only then certain services could be launched, but then again, we realised it that at a certain stage it wasn't enough... I mean, simply [better] equipment was needed, and in 2013 we again applied for a European project. We got the money and could finance our equipment, and only then we were able to launch these larger services, I meant on a larger scale. But the hardware is a very important thing." (Supplier 2)

2.4. Procurement practices

Advanced technology can be notoriously hard to procure (European Commission, 2010), and it applies to ICT as well. IT evolves constantly, and updating it is a necessity in terms of data safety and preventing disruption in the functioning of any institution that heavily relies on its IT systems. Clearly, requirements that health care information systems are expected to meet are much higher. Procuring such solutions necessitates a more flexible and multi-faceted approach than procurers working in the health care system are accustomed to, which has an impact on e-health implementation.

In the experts' opinion, a fear of breaching the law, widespread among the procurers, played an important role in how e-health solutions are bought. Anxious about unwittingly breaking the law, procurers fail to reach for tender procedures that would allow them to address lifecycle costs and cost-efficiency, instead of simply the purchase price:

"For now, it [interest in using the new procurement procedures] is small. My observation shows that people who do that [run tenders], firstly try not to run the risk of breaking the law or getting into trouble with the Public Procurement Office, rather than use it to achieve the aim. [...] the people responsible for that try to stay away from risk (…) of, for example, using criteria other than price." (Expert 1)

The fact that the criterion of price (that is the purchase price) still dominates in tenders, being often the only criterion and almost always the deciding one, is another barrier to procuring functional, innovative, cost-efficient e-health solutions. One of the experts' views was that choice based on other criteria should be made obligatory:

"Perhaps, if certain things were regulated, then the tender procedure would better support innovations (...)." (Expert 2)

Another expert explains that procurers are forced by law to use criteria other than the purchase price, but still are afraid to do so, so other criteria remain a formality without actual influence on the outcome:

"Right now (...), people who do that [procurement], try to avoid liability related to, for example, including a second criterion besides price (...)." (Expert 1)

Generally speaking, regulations are perceived as imposed, troublesome and something to be afraid of, or at least as a barrier to be overcome.

"It's important that we talk the same language. Very often the languages we use differ a lot, like on the Tower of Babel, they've become mixed up. IT experts talk their way, physicians – their way, patients – their way. Everyone talks about something else... while using identical words. [...] That's why reaching a consensus, a final one while planning and creating a new solution, for example, of IT kind... it's like going through a trial by ordeal with the whole interdisciplinary team." (Buyer 1)

The suppliers of ICT were in general critical of buyers' ability to conduct tenders, especially the way they describe what they want from the product. They think it is the main reason behind buyers' dissatisfaction with the e-health solutions procured.

"And here we arrive at the heart of the problem. [...] The biggest problem from my point of view is that a buyer is not capable to articulate and specify requirements in a way necessary for a proper description of the object of procurement. [...] Because, well. How can someone describe what they need if they never saw it?" (Buyer 2)

The mindset exemplified in the above statement itself seems to hinder the success of e-health because it presumes that only existing solutions can be procured.

2.5. Financing models

There are no comprehensive financing policies regarding IT in general, and e-health in particular, at the national level. This leaves hospitals to fend for themselves unless there is a regional (region, voivodship) policy in this area. In fact, there are substantial differences in e-health development between Polish regions. Insufficient funding, especially for larger projects, was repeatedly mentioned by buyers as an obstacle to investing in more complex e-health products. One vital source of money for such investments are the EU funds mentioned above. Failure to secure EU funds was often cited as a reason for abandoning e-health projects altogether. They are deemed necessary for development by all stakeholders, but – according to suppliers – too often used for projects of debatable value:

"The hospital gets something new, but after the project is over – that is, after around five years – a problem emerges: how to keep it running?" (Supplier 2)

E-health is rarely described as an investment improving the cost-effectiveness of treatment, but rather as a tool facilitating data management and administrative tasks. A buyer (a hospital IT system administrator) expressed slightly different concerns, questioning the allocation of scarce health care resources:

"Is there a point investing in the [IT] equipment if you can invest this money in the process of treating patients?" (Buyer 2)

This comment may echo concerns of decision-makers within health care system, faced with under-investment and shortages.

Suppliers also point out that many hospitals hardly have the resources needed to employ qualified IT specialists, let alone to pay for their professional development. They consider the absence of such expert input in the procurement process a major obstacle not only to agreeing on a desired product's characteristics but also to successful implementation. Not all hospital managers seem to realise this, as one hospital IT system administrator mentioned:

"Unfortunately, it [hardware IT infrastructure] is so changeable, that the directors delude themselves that they'll spend money [on it] just once, and they'll have peace of mind for years. It's simply not true. Investment in IT is constant. Constant." (Supplier 2)

Clearly, e-health suffers from the lack of investment policies that would support long-term thinking about ICT. However, cost-efficiency (or lack thereof) in comparison to traditionally delivered services was not talked about by the respondents. Instead, they focused on streamlining administrative procedures and reaching patients in need. Purchases and investments seemed to stem primarily from a formal requirement (e.g. use of national insurance-verification system needs access to the Internet), a chance to get funding (mainly EU funds), or a desire to acquire something "new and modern-looking".

"And then they say 'Yes, we're getting [self-service] terminals for patients. [...]!' My goodness, why

another contraption that will just stand there somewhere? What is it supposed to be doing?" (Supplier 2)

Part of the explanation may be that public health care is not ruled by free market logic, as explained by one of the suppliers:

"[...] it shows why solutions like e-registration are most often superfluous in the case of public hospitals. [...] I'm sorry, I misspoke. They're superfluous from the point of view of the hospital and ambulatory care managers. Because they're convinced, and that's how it really is. A hospital or an ambulatory clinic director knows that, if there isn't an e-registration, they're going to have a lot of patients." (Supplier 1)

2.6. Health professionals' resistance

The medical community's attitude towards e-health and acceptance of specific solutions is of paramount importance for success (or failure) of e-health implementation. Consequently, medical professionals' reluctance may potentially be a serious barrier to e-health. Only one of the respondents was a doctor who is heavily involved in telemedical projects. The vast majority of the respondents were of the view that in general physicians hold an adverse attitude towards telemedicine. One of the interviewees pointed out that in the current financing scheme, procedures (not results) are contracted by the public payer. This encourages doctors to conduct services, not to cure patients. Introducing more transparency and control might not be welcomed by this professional group due to (assumed by the Supplier 1) cynical personal motivations and financing system's failure:

"[...] it's hard to say whether doctors would be at all interested in something like that [EHR] because of, let's put it that way, a not entirely healthy system of financing health care that functions in Poland. I mean, in Poland it is treating a patient, not curing a patient, that is financed." (Supplier 1)

Another respondent ascribed physicians' reserve to both economic fears and attachment to the principle of medicine as an art.

"[...] the doctors community has always been... mmm... distrustful of these solutions, naturally being afraid of losing their jobs... [...] it is generally thought that the doctors community has always been very cautious, they have always believed that despite all, [...] physician should examine the patient organoleptically and that seeing the patient through some camera somewhere out there, or an attempt at consultation on the basis of basic tests sent electronically

[...]... they simply think it is not trustworthy and are afraid of it." (Supplier 2)

This notion is confirmed to a certain degree by research into medical professionals' attitudes towards various types of e-health. For example, Duplaga and Grysztar (2013) found out that physicians accept e-health solutions that serve education, administration and data transfer. However, their support for remote consultations is very low. However, Zgliczyński et al. (2013) presented results evidencing a more sympathetic attitude towards telemedicine (especially telemonitoring and cardiologic services). The main barriers in their view were the lack of financing and infrastructure. Both studies focused on relatively young doctors (around 40). The obvious contradiction between these two surveys suggests a need for further investigation. In the undergoing quantitative research (surveys) carried out as a part of the same project, physicians' resistance to telemedicine was noted by the physicians themselves. The phenomenon will be further analysed as it is particularly significant for the development of e-health in Poland.

Conclusions

The next few years will likely be a decisive period for e-health development in Poland. For a prolonged period, computerisation of health care has been plagued by underfunding, failed projects and delays. While some forms of e-health (e-registration, EHR) gained some popularity, telemedicine was at a stalemate, mainly because of its precarious legal status. Legal obstacles to any form of remote consultation involving a patient prevented the development of such services. It was particularly frustrating for suppliers of e-health solutions and experts in the field. In 2015, the legal stalemate was largely resolved, making the development of telemedicine possible.

Proactive steps taken by the national payer (NFZ) towards contracting telemedicine are signs that telemedicine (and likely other branches of e-health) has a good chance of going mainstream. It is worth noting that even if NFZ does not seem to have a comprehensive strategy for telemedicine (or it does not make it public), it certainly seems to have priorities concerning investment in certain specialities (geriatrics, cardiology, psychiatry). The national payer is also cautiously starting with small-scale pilots. The process of telemedicine reimbursement is at such early

stages though that no information regarding the success of contracted services is yet available. Some doctors' reluctance to conduct consultation in this way, confirmed by both literature and the interviewees in this research, will certainly be tested. It is still too early to establish if it would constitute a barrier to e-health development. However, demographic changes, such as a new generation of doctors who regard ICT-based solutions as a norm, could influence the attitude of this professional group.

Since the introduction of the amendment to the Act on the System of Information in Health Care increased, and indeed unprecedented, media attention is given to patient data safety. As a result, previously ignored and potentially serious shortcomings have been uncovered in this area. This trend will probably continue as national EHR system is due (again) to be introduced. Tellingly, in interviews conducted before the legal changes took place, interviewees did not express many concerns for data safety, with some suppliers considering restrictive data protection regulations an obstacle to using newest technologies. Both existing (deficient) solutions and lack of appreciation for the issue may potentially prove to be obstacles to the development of e-health because of undermining of public trust in the safety of ICT in healthcare.

Basic IT infrastructure still is not universally present in Polish hospitals. It remains an open question how much should be invested in it, how to pay for IT specialists' salaries, for maintenance and updates. This barrier, mentioned by all categories of respondents, is likely to persist unless a national programme of e-health is prepared and implemented, securing funds for development of e-health nationwide. Further recognition of e-health services by NFZ, and contracting these kinds of services, may also contribute to investments in IT infrastructure.

Literature

Adamski, D. (2014). *Overview of the national laws on electronic health records in the EU Member States. National Report for Poland*. Brussels, Belgium: Milieu Ltd & Time.lex. Retrieved from http://ec.europa.eu/health/ehealth/docs/laws_poland_en.pdf

Bartczak, K., & Barańska, A. (2015). Analiza wykorzystywania systemów informatycznych przez polskie szpitale [Analysis of the use of information systems by Polish hospitals]. *Acta Universitatis Nicolai Copernici Ekonomia, 46*(2), 185-193. Retrieved from http://doi.org/10.12775/AUNC_ECON.2015.010

Bell, B., & Thornton, K. (2011). From promise to reality: Achieving the value of an EHR. *Healthcare Financial Management, 65*(2), 51-56.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101.

Duplaga M., Grysztar M. (2013), Poglądy lekarzy na temat przydatności systemów e-zdrowia [The views of doctors about the usefulness of e-health]. *Hygieia Public Health, 48*(4), 553-559. Retrieved from http://www.h-ph.pl/pdf/hyg-2013/hyg-2013-4-553.pdf

eHealth Policy (EU). Retrieved from http://ec.europa.eu/health/ehealth/policy/index_en.htm

EU Health Programme. (2014). *Overview of the national laws on electronic health records in the EU Member States and their interaction with the provision of cross-border eHealth services*. Brussels, Belgium: Milieu Ltd, & Time.lex. Retrieved from http://ec.europa.eu/health/ehealth/docs/laws_report_recommendations_en.pdf

European Commission. (2004). *E-Health – making healthcare better for European citizens: An action plan for a European e-Health Area*. Retrieved from http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2004:0356:FIN:EN:PDF

European Commission. (2010). *Risk management in the procurement of innovation Concepts and empirical evidence in the European Union Expert Group Report*. Retrieved from http://ec.europa.eu/invest-in-research/pdf/download_en/risk_management.pdf

European Commission. (2013). *Horizon 2020 calls for eHealth projects launched*. Retrieved from http://ec.europa.eu/digital-agenda/en/news/first-horizon-2020-calls-ehealth-projects-launched

European Commission. (2014). *European Innovation Partnerships – Innovation Union – European Commission*. Retrieved from http://ec.europa.eu/research/innovation-union/index_en.cfm?pg=eip

European Commission. (2015). *eHealth and Ageing*. Retrieved from https://ec.europa.eu/digital-agenda/en/ehealth-and-ageing

Iakovidis, I., Wilson, P., & Healy, J. C. (2004). *Introduction: How We Got Here. In E-health: current situation and examples of implemented and beneficial e-health applications*. Amsterdam, Netherlands: IOS Press.

Karlińska, M. (2014). Informatyzacja opieki stacjonarnej w systemie ochrony zdrowia na przykładzie warszawskich szpitali publicznych [Computerization of in-patient care in the health system on the example of Warsaw's public hospitals]. *Studia Ekonomiczne, 199*, 99-106.

Karlińska, M., Masiarz, P., & Mężyk, R. (2014). Przyspieszenie wdrażania technologii w regionalnej ochronie zdrowia dzięki finansowemu wsparciu UE – przykład województwa świętokrzyskiego [Acceleration of the implementation of technology in the regional health care thanks to the financial support of the EU – the Świętokrzyskie province case]. *Collegium of Economic Analysis Annals, 35*, 207-218.

Klinger, K., & Janczura, M. (2016, November 23). GIODO powinien pójść do lekarza: Dane medyczne nie są zabezpieczane [Inspector General should go to the doctor: Medical data are not secured]. *GazetaPrawna.pl*. Retrieved from http://prawo.gazetaprawna.pl/artykuly/995326,giodo-dane-medyczne-niezabezpieczone.html

Król, T. (2015). Telemedycyna będzie finansowana przez NFZ [Telemedicine will be financed by the National Health Fund]. *Serwiszoz.pl*. Retrieved from https://serwiszoz.pl/ittechnologiesprzet/telemedycyna-bedzie-finansowana-przez-nfz-2678.html

Kumar, S., & Bauer, K. (2011). The business case for implementing electronic health records in primary care settings in the United States. *Journal of Revenue and Pricing Management*, *10*(2), 119-131.

MarketsandMarkets. (2015). *Telehealth Market by Component* (*Hardware* (*Blood Glucose Meters*), *Software* (*Integrated*), *Services* (*Remote Monitoring*, *Real-time Interactions*)), *End User* (*Providers, Patients*) *& by Delivery Mode* (*On Premise, Web, & Cloud*) *– Trends & Global Forecast to 2020*. Retrieved from http://www.marketsandmarkets.com/Market-Reports/tele-health-market-201868927.html

Ministerstwo Rozwoju Regionalnego [The Ministry of Regional Development]. (2012). *Strategia Rozwoju Kraju 2020* [*The National Development Strategy 2020*]. Retrieved from https://www.mr.gov.pl/media/3336/Strategia_Rozwoju_Kraju_2020.pdf

Ministerstwo Zdrowia [Ministry of Health]. (2009). *Kierunki informatyzacji „e-Zdrowie Polska" na lata 2011-2015* [*Directions of computerization "e-Health Poland" for 2011-2015*]. Retrieved from http://www2.mz.gov.pl/wwwfiles/ma_struktura/docs/kierunki_e_zdrowie_09022011.pdf

NFZ [NHF]. (2015). *Projekt zarządzenia – warunki zawierania i realizacji umów – świadczenia zdrowotne kontraktowane odrębnie* [*Draft Decree – conditions for conclusion and implementation of agreements – health services contracted separately*]. Retrieved from http://www.nfz.gov.pl/zarzadzenia-prezesa/projekty-zarzadzen/projekt-zarzadzenia-warunki-zawierania-i-realizacji-umow-swiadczenia-zdrowotne-kontrak-towane-odrebnie,6385.html

Rozporządzenie Ministra Zdrowia z dnia 8 marca 2012 r. w sprawie recept lekarskich [*Regulation of the Minister of Health, dated 8 March 2012. On medical prescriptions*] (Dz.U. 2012, poz. 260) *2012* (PL).

Ustawa z dnia 9 października 2015 r. o zmianie ustawy o systemie informacji w ochronie zdrowia oraz niektórych innych ustaw [*Act of 9 October 2015. Amending the act on the information system in the health care and some other acts*] (Dz.U. 2015, poz. 1991) *2015* (PL).

TOK FM/rynekaptek.pl. (2015). *GIODO: e-recepty nie chronią danych osobowych* [*Inspector General: e-prescriptions do not protect personal data*]. Retrieved from http://www.rynekaptek.pl/prawo/giodo-e-recepty-nie-chronia-danych-osobowych,10730.html

TVP.info. (2015). *Konsultacje lekarskie za pomocą łączenia wideo. Telemedycyna wkracza do Polski* [*Medical consultations by combining video. Telemedycyna enters Poland*]. Retrieved from http://www.tvp.info/21570820/lekarze-udziela-porady-za-pomoca-laczenia-wideo-telemedycyna-wkracza-do-polski

Zgliczyński, W., Pinkas, J., Cianciara, D., Sitarek, M., Berdyga, T., Nowicka-Wasilewska, J., & Kawwa, J. (2013). Telemedycyna w Polsce – bariery rozwoju w opinii lekarzy [Telemedicine in Poland – barriers to the development, in the opinion of doctors]. *Medycyna Ogólna i Nauki o Zdrowiu*, *19*(4), 496-499. Retrieved from http://jml2012.indexcopernicus.com/fulltxt.php?ICID=1096968