EHEALTH IN FINLAND: EXPERIENCES AND LESSONS LEARNED

Hyppönen, H[1]

Kurzfassung

Die meisten EU-Mitgliedstaaten und Länder in der i2010-Untergruppe eHealth hatten bis 2006 eine dokumentierte eHealth Politik. Strategien, welche Informationen über das Management einer eHealth-Einführung geben, sind dagegen noch selten. Dieser Artikel beschreibt den aktuellen Stand und die geplanten Schritte zu Deployment und Monitoring von eHealth in Finnland, basierend auf der Gesetzgebung. Erfahrungen und Lessons Learnt bei der Umsetzung und Evaluation der finnischen eHealth-Systeme werden in der Präsentation dargestellt.

Abstract

By the end of 2006, most European Union (EU) Member States and countries represented in the i2010 Subgroup on eHealth had a documented policy on eHealth. Documented strategies for providing evidence for management of the implementation are still rare. This article describes the situation and plans of eHealth deployment and monitoring in Finland based on legislation. Experiences and lessons learned in implementing the eHealth systems and evaluation will be described in the presentation.

Keywords − eHealth Policy; Implementation; Evidence Based Management; Evaluation

1. Background

Most European Union (EU) Member States and countries represented in the i2010 Subgroup on eHealth had a documented policy on eHealth by the end of 2006. The eHealth policies in different countries contain very similar elements: there is the technological and semantic Infrastructure including information networks, information structures, legal frameworks, ICT education, patient and professional ID mechanisms, as well as the Electronic Patient Record systems (EPRs). EPRs commonly consist of a comprehensive electronic patient records including narrative text as well as summary and administrative data. This is augmented with integrated picture archiving and communicating systems (PACS) and electronic laboratory systems. On top of the infrastructure there is the service layer, containing e.g. eReferrals, eDischarge letters, eLab results, exchange of images, and exchange of EPR data for continuity of care. [10, 14] Compared to the well established eHealth policies, well documented strategies for providing evidence for management of eHealth implementation are rare [3].

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[1] Information Department, Institute for welfare and health (THL), Finland

2.   The Finnish eHealth system deployment and plans

2. 1.   Electronic documentation and use of Patient Data

In Finland, the basic eHealth infrastructure with core services is already commonly used in everyday health care work, much more comprehensively than in social care. The legacy systems (EPRs) are in comprehensive use in health care organisations, allowing for exchange of patient data electronically in a secure manner between registrars - e.g. primary and secondary health care providers. However, Finnish electronic patient records still mostly use plain narrative texts. A national code server was built in 2003-2004 and has been providing the main codes since 2004 (www.stakes.fi/koodistopalvelu). Shift towards more structured documentation is going on to support national and regional level access to core patient data regardless of where it has been provided. The adoption of PACS and teleradiology in everyday practice is high in Finland. In 2007 all hospital districts were producing over 90% of their medical images only digitally. Laboratory Information System was in use in all of the 21 hospital districts. [18] Regional information systems have been in use since early 2000s. They are further developed in parallel to implementing the National Health Information System (NHIS) with eArchive, ePresciption and eViewing services, providing a nationwide infrastructure by 2015 (figure 1). With this infrastructure, the patient data and prescriptions will be securely available nationwide for authorised personnel as well as for the patient him/herself.

Parallel to B2B-communication, interactive eHealth and eWelfare services for citizens are increasingly common. In 2011, online web-based question-answer service with patient authentication was available in 17% of health care centres. Online appointment booking was in use in half of the hospital districts and in 15% of the health care centres, mainly for laboratory appointments. Citizen initiated recording (transferring health status information provided by patient into a health care system repository was in use in 2 out of 21 hospital districts and in 2% of the health care centres. [18] National eHealth services for citizens are further being developed in the SADe-programme (eGovernment and eDemocracy programme) during 2009 - 2015, funded by the Ministry of Finance [4]. A central access point, Suomi.fi website, is being updated to include access to all central and local government services. [18] For social and health care sector, national level eServices for citizens will in the first phase include access to generic health and welfare information and decision support for citizens, self-health checks and risk tests, national service and provider database, and feedback services. National system and information requirements will be drawn for Personal Health Record, eBooking and eMessaging services.
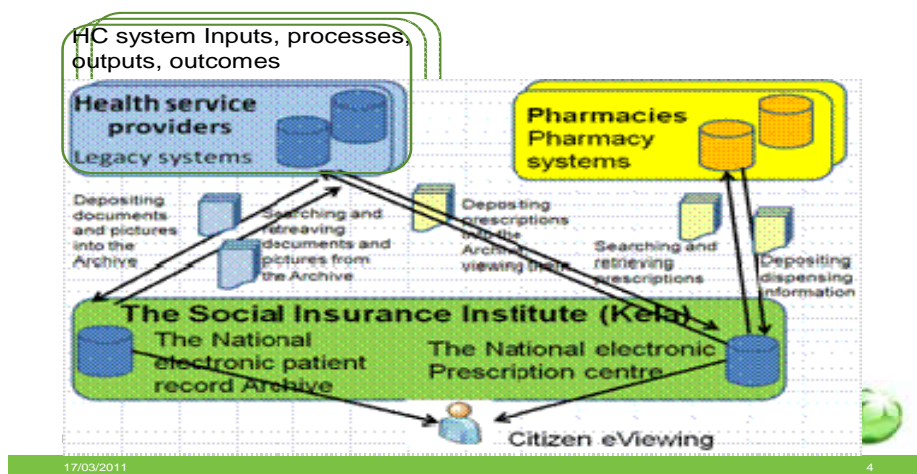

Figure 1 The National Health Information System (NHIS) KanTa, as a tool for the Health Care Providers

Parallel eHealth development will be coordinated with coordinating development funding from different national sources by collecting all eHealth development under a national programme lead by the Ministry for social affairs and health. This way projects applying funding for eHealth development from the Ministry of Health and Social Affairs, the Finnish Funding Agency for Technology and Innovation, EU, Municipalities, and several other public funding sources will be linked. Prior to SADe-programme there were e.g. 43 different projects developing citizen's private electronic health records, without mechanisms for collaboration and mutual learning. Prerequisite for funding is a plan for maintaining and further developing the eServices after the projects end. A mechanisms with which to build the knowledge base e.g. by collecting and sharing requirements, specifications or evaluation results to be used as a basis for new projects is created.

2. 2. Health information exchange

 Electronic referrals and eDischarge letters were at the end of 2011 used in most (90%) of hospital districts (specialized care hospitals) and in primary care organisations (municipalities), transferred with VPN connections. There were five different types of regional information systems in use by 16 of the 21 hospital districts in the end of 2011. The patient information available for viewing varied – mainly it included clinical documentation, laboratory and imaging results and reports. All hospital districts and over 70% of health centres were able to exchange radiology and laboratory results.[18] However, all organisations did not do this via regional systems, since have access to regional information systems. Even if access existed, doctors did not necessarily use the system: usage rate among doctors who had access to the system was 48% [21]

Implementation of KanTa, the National Archive of Health Information, has started from the electronic prescription (ePrescription) and the national Pharmaceutical Database in 2010. By the end of February 2012, there were 584 403 ePrescriptions in the ePrescription database, provided by doctors working in 44/336 municipalities. [19] At the same time citizens have gained online access to their personal prescription data. The electronic archive of patient records (eArchive) will be opened up to public- and private-sector health care providers and citizens in stages. It will include national access to core patient data for carers and patients. eArchive includes an electronic system for patients to give consent for carers to view their data as well as informing about their last will concerning care.

eArchive was piloted in Kuopio municipality during 2011-2012. During three months piloting, patient data for over 8000 patients were stored in the eArchive. The most important lessons learned from the pilot were that structured documentation, required in the national eArchive, requires changes in work practices and increased focus on usability. In addition structured documentation requires wide personnel training and end user support.[19]

3. Providing evidence for development of eHealth systems and services

Monitoring eHealth implementation was one of the new national tasks in the 2010 updates of the Law on electronic processing of social and health care customer data (first issued on 9.2.2007). One stream of data that has been collected systematically since 2003 is for monitoring access and use of the infrastructure elements and eServices [11, 18]. The method is a structured web based questionnaire with standard questions, targeted at all public HC providers and a sample of private HC providers.

Access and use is an eEurope and OECD eHealth indicator. However, with saturation of access level and use, it is not a sufficient measure for showing the progress in Finland any more. In 2008-2009, Canadian, Australian and UK approaches [1, 5, 6, 13] were used as a basis for creating a

comprehensive framework for formative and summative evidence on the national eHealth system implementation [8]. Contextual elements were added to the framework using the actor network theory and a model of an activity system as frames of reference. The resulting framework contained following categories of information needed for monitoring eHealth progress and impacts [19]:

- Context of use (incl. national objectives, intervention, its users and purpose of use)
- Intervention access and use
- Intervention quality (incl. system usability and user satisfaction, information quality)
- Impacts on
  o outcomes (incl. clinical effettiveness, patient safety, resource utilization)
  o processes (incl. adherence to guidelines, division of work, communication, patient participation)
  o structures (incl legal aspects, privacy, secondary use)

Measuring **access** and **use** has already been established with several consequent data collections. For Social care the first measurement with the similar instrument was performed in the end of 2010 [18]. Measuring **quality** of the eHealth tools has been conducted nationwide for the first time in the beginning of 2010 from the viewpoint of doctors. This was done in order to map the NHIS baseline situation. The data collection followed the (NH)IS use processes and information needs in different use contexts. The results showed dramatic differences in IS quality between different legacy systems. Doctors in public hospitals were most critical towards their systems, doctors in private clinics most satisfied. [7, 16-17]. There were also differences between access, use and user satisfaction of different regional systems. The results have been taken as a basis for development of legacy systems as well as the NHIS.

A pilot was conducted in 2009 where statistical data was extracted from a patient record system to measure the **impacts** of health information exchange between patients and carers on number and types of visit, professional division of work, time spent per patient, types of procedures, and health impacts (specific laboratory test results). The pilot showed how important this type of analysis can be to show impacts of implementation of IT tools, and how hard it is to get reliable, good quality national level data from the statistics for the basis of conclusions.

Nordic Research Network has been established as a subgroup for the Nordic Council of Ministers eHealth group in the first quarter of 2012. The task is to compare the data collected in Nordic countries regarding access, use, intervention quality and impacts of eHealth interventions [2, 15] to further improve the data collection tools and to work towards an international minimum dataset for assessing IS use and quality. A workshop was arranged in Medical Informatics Europe Conference in Oslo in August 2011 to commence this work.

The national evaluation framework is important for providing a comprehensive view of data categories, possible measures and data sources. The provided evidence is important to further develop the current services as well as for showing the direction towards the next generation eHealth services. The implementation of the overall framework in Finland is has progressed to the third phase of the "Good Evaluation Practices for Health informatics" or GEP-HI-model - defining project plan and operational methods. The surveys that have been conducted, log information and statistics all provide input to a comprehensive monitoring system, processing and reporting the data from multiple sources. Defining the outputs needed by different stakeholders will serve as feedback to further improve the inputs.

4. Conclusions - lessons learned

The development of a nationwide eHealth infrastructure has taken (will take) ca 20 years, and has been a costly endeavour. However, it has been a necessary ground work for building services that benefit both professionals and citizens. The development of the NHIS as well and its elements (e.g. the legacy systems) has been technology-centred, and implementation has been enforced by legislation. Service providers and professionals have had difficulties in seeing its added value in their different work processes. The IS quality survey revealed mixed feelings about the NHIS services, which are used via the current legacy systems. Several problems in usability and utility of the current systems were discovered, which decrease the use of IS for data exchange between registrars. The good news is that the results of the evaluations have already had a profound impact on legacy system providers and their users' collaboration. The new Health Care Act will also give patients right to select their public care provider, which will greatly increase practitioners' need to access patient data regardless of where it has been produced, adding further value to the NHIS system.

The NHIS will be connected to a nationwide eGovernment infrastructure (eService platform and account) that is being developed in a national SADe-programme. Provision of evidence for management of the programme will be an integral part of the SADe-programme from the start. Moving from technology-centred to user-centred development has been a challenge for health and technology experts, as well as funders of development. The citizen's eHealth and eWelfare service programme is he first eHealth programme, where a systematic method for creating functional, information, IS system and technical architecture is being deployed, including Human-centred development of interactive systems according to the ISO standard. It will be interesting to see, how this impacts the outcomes of the projects.

Developing Citizen eServices entails moving from organisation-based to citizen-centric informatics philosophies, which has proven a big change for current health professionals. Management of this change proactively e.g. via close collaboration of eService developers and users in order to develop new work practices to exploit nation-wide eServices is a big effort.

Survey of eHealth projects prior to SADe-programme was important to push forward better coordination of the funding mechanisms of separate eHealth development projects and enhancing collaboration between projects.

In conclusion, much has been done in Finland towards a functioning eHealth system that benefits all stakeholders, but much is still to be done in order to achieve this. There are several invaluable lessons to be learned from the past experiences, as well in Finland as in other countries. These lessons should not be ignored but used to support future development.

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Corresponding Author
Hannele Hyppönen
National Institute for Health and Welfare of Finland
Email: hannele.hypponen@thl.fi