

**Electronic Health Data – Enablers for Quality Care and Personalized Health**

Perspective of Estonian Health Insurance Fund

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Ladies and gentlemen,

Let me thank the organizers for the opportunity to address this distinguished audience on issues of personalized health from the prospective of purchaser of medical services. There is no need to emphasize, let alone to explain the importance of this topic for health care policies and policymakers in the twenty first century.

*General remarks*

For one, advances in information technologies and in medical science have released completely new potential to provide better and more personal health care services. Today's information technology provides us with limitless opportunities to collect and store medical and health data, to keep data and medical records up to date and available on real time basis, and to assist medical profession in decision making by providing access to treatment protocols and algorithms. Moreover, technology provides direct access to patients that are tens or hundreds of kilometers away from the doctor. To put it simply - we have an immense technological capacity at our disposal that allows us to live better and longer lives

Nevertheless, today's world also provides us with examples that the potential of technological advances needs time to materialize in every-day practice. This is particularly true in areas that are by definition subject to extensive state participation, either as direct provider of services or as intermediary between customers and service providers. Let us take as a counterfactual an example of banking and finance. In sophisticated portfolio management and retail banking alike, market forces and healthy competition have given financial institutions strong incentives to put into everyday use cutting edge computing methods to increase wealth and to communicate with their customers via different wireless or wired channels. The electronic

banking is a rule of the game, starting with customer relations and ending with high value-added services. If e-services are harnessed to provide value added in personal wealth services, the potential of e-services must be used to the fullest extent also in personal health services.

The potential of e-services in health care needs to be top priority for a number of very concrete reasons. For once, technological advances increase vastly the potential for personalized and comprehensive approach to treatment. Every patient and every case is ultimately personal and unique by definition. Consequently, more personalized approach to medical treatment will provide better outcomes with longer and healthier life spans. In this context, technology will be key driver to achieve the main goals of health care policies.

Moreover, while the modern technologies are instrumental to provide better medical outcomes, they are also instrumental to make better and more efficient use of available resources. We all know that western economies can no longer count on extensive increase in health care spending as it occurred over the past decade, prior to the financial crisis. In advanced countries of the EU, the challenge is to maintain the current level of health care coverage, as people live longer. In catching up EU countries with some room to increase the share of health care spending to GDP, the challenge is to improve the coverage of public insurance. In either case, the issue is not to pay more for the current service level, but to increase the efficiency and productivity. Here, the use of information technologies is instrumental.

The key question is how to use the available policy tools to support and, if needed, to coerce service providers in health care system to adopt and to implement e-services to achieve better results in medical treatment and in customer service. Moreover, we know that cost of medical technologies is the key driver of higher health care spending. It is quite natural that advanced technologies need very substantial investments. However, one can reasonably assume that new technologies should over time become more affordable and, in any case, should increase the average productivity of existing treatments. After all, this is what has happened in pharmaceuticals' sector where the use of generic drugs has vastly improved the affordability of treatment. I believe that full use of e-services contribute to overall productivity in health

care, and thus will increase marginal productivity of new investments in medical technologies.

After these general remarks, I will turn to concrete Estonian experiences. In order to understand the context, I will firstly provide a brief description of Estonian public health insurance. Thereafter, I will describe the state of play and main challenges ahead.

### *Estonian Health Insurance Fund*

Estonian Health Insurance Fund is the sole provider of publicly funded health insurance in Estonia with over 1.2 million insured customers. In the framework of public health insurance system, HIF reimburses service providers for medical services that have been delivered to our customers and reimburses costs of relevant prescription drugs to pharmacies. Our yearly business volume is approximately 830 million euros. We are financed by health care component of social security contribution that equals to 13 percent of gross salaries and is paid by every employer in Estonia.

In order to fulfill our mandated tasks, HIF has entered into service contracts with over 800 family doctors, over 20 strategic and other hospitals as well as numerous other service providers. The system of family doctors is the first and the main point of contact for our customers with health care system. Family doctors may refer patients to specialist treatment to hospitals. Referral by family doctor is in most cases a prerequisite for HIF to reimburse hospital for services provided. Family doctors are financed by yearly fixed sum payments per patient plus additional sum to cover costs of tests and analysis, while hospitals are reimbursed per service delivered on fee-for-service and/or DRG basis, subject to pre-agreed yearly limits. Both family doctors and hospitals may also deliver fee-for-service treatment to patients, in addition to services contracted by HIF.

In this context, the HIF has a vital interest in promoting the use of information technologies by our contract partners in at least four respects. First, availability of up-to-date medical

information for our contract partners improves the quality of treatments. Second, the use of electronic channels by medical profession in addition to face-to-face contact will increase the efficiency of the most valuable resource in health care – the doctors' time. Thirdly, the use of information technologies provides us with tools to assess the quality of treatment. And last but not least, information technologies do serve as a prerequisite for comprehensive treatment of patients, in particular of those patients with chronic conditions. In this respect, the availability of medical history and other information is patient's inalienable right and the key precondition of his or her full participation in comprehensive treatment process.

Let me turn now to the key elements of using information technologies in Estonia's health care system as seen from the prospective of National Health Insurance Fund.

*Use of information technologies from the prospective of HIF – medical data*

The first prerequisite for efficient e-services is the availability of up-to-date medical data. HIF is not concerned with information systems and databases of each and every hospital or other service provider. However, we are very much concerned with the availability sufficient data on the level of health care system that is accessible to HIF and to all other participants of the system, i.e. to patients and service providers. Currently, there are three databases on the macro level.

First, there is a database of e-prescriptions, i.e. since 2010 are effectively all prescriptions issued electronically only, prescriptions are stored in central database that is owned and operated by HIF. Pharmacies are reimbursed only after the prescription is issued and stored in central database. Access to prescriptions database is ensured to a patient and to his or her physician.

Second, there is a database of invoices for all treatments that are reimbursed by HIF to hospitals for out-patient services, in-patient services and long term nursing services. Service providers are reimbursed only after electronic invoice for the treatment of the case with

detailed list of services that were been provided has been received and stored in central database of HIF. Access to database of treatment invoices is available to HIF only.

And thirdly, there is a comprehensive e-health information system. E-health information system is based on a separate law and is owned and operated by a special purpose vehicle - Estonian E-Health Foundation. E-health is supposed to achieve several extremely important while challenging goals and very substantially contribute to two overarching tasks of Estonian health care policy: increasing healthy life years and improving rates of survival. To this end, firstly, e-health is to store all epicrises, i.e. summaries of all medical case histories that have been handled by Estonian service providers, including by family doctors and hospitals. Secondly, the other goal is to store and/or provide access to results of all medical analyses and tests as well as to medical images. The combination of medical history summaries, test results and images should ensure that patient is *de facto* in full possession of his or her medical data and his or her physician has all available data at hand to make informed decisions about prevention and treatment of concrete patients.

Thirdly, the e-health system should also serve as a platform for e-services, starting from electronic referrals and e-consultations and extending in the future to variety of other services, for instance such as support algorithms related to medical protocols. These more sophisticated uses of e-health system are of critical importance in the future. E-services will improve timeliness of medical care and ensure increased access to specialist services, thereby resulting in better quality and more efficient use of resources. For instance, it is possible for a family doctor to issue and to store electronic letter of referral, including in e-health database and to consult a specialist physician via electronic channel on condition of a particular patient.

While e-prescription and e-invoice databases operated by HIF contain full information of prescriptions and medical treatments that are reimbursed by HIF, the e-health information system is work on progress, as completeness and quality of data that is submitted by hospitals and family doctors is improving. We have also observed that the use of medical data in e-health by doctors has been significantly increasing recently. Nevertheless, there is still room

for improvement and additional measures by state might be in order to incentivize interaction between service providers and e-health, and to make full use of its opportunities.

*Use of information technologies from the prospective of HIF – e-services*

Let me now turn from availability of and access to medical data to e-services, i.e. medical services that are used in connection with treatment of particular case. From the prospective of HIF, the key issue is how to support increasing use of innovative and evidence-based e-services, as they are resource efficient, and provide our customers with better and more convenient access to medical care. Naturally, we need to maintain the principles of cost-effectiveness and of proven added value as a basis for inclusion in HIF list of services.

Firstly let me just to recall that virtually all prescriptions in Estonia are issued and processed electronically, i.e. all prescriptions are processed paper-free. This system is obviously very efficient from the customers' point of view, but as importantly, it ensures availability of sufficient information for HIF to perform ex post controls and assessments of treatment practices. A particularly noteworthy achievement is a marked increase in use of generics, as electronic format makes it very easy to control whether prescription is based on ingredient rather than on a brand. Electronic database of prescriptions is also a vast source of data for medical research as well as for assessing implementation of medical protocols and measuring various clinical indicators.

Furthermore, as was just emphasized, the other priority for HIF is to promote the use of information technology for consultations between family doctors and specialist physicians. For the first time, the HIF included this year in its list of reimbursed medical services e-consultations in two specialties, urology and endocrinology. In very broad terms, e-consultation as a separate service means that family doctor enters a referral into the e-health system as a structured set of medical data, including medical case history and results of tests tailored to needs of a particular specialty. Specialist will return on the same electronic referral

the diagnosis and his or her assessment within two days on whether patient should be referred to further specialist out-patient or in-patient treatment.

We envisage extension of e-consultation to other specialties to save the doctors' time and to reduce pressure on and waiting time of out-patient ambulatory services provided by hospitals. More generally, we believe that it is important to move to fully electronic system of referrals in the coming years and to ensure one comprehensive central database as part of the e-health system. In the context of population aging and increase of chronic conditions, this would greatly enhance the efficiency of interaction between integral parts of health care system, notably between primary level and hospitals. Electronic referrals will also reduce waiting times and provide customers with more convenient access to services. Most importantly, fully electronic system is likely to increase the quality of information provided in conjunction with referring the patient to subsequent phase in health care system.

Looking forward, the challenge for HIF is to promote the use of innovative e-services more generally in order to improve quality of care, enhance efficiency and, ultimately, to provide for healthier and longer life. One obvious question is how to support the use of opportunities provided by telemedicine, e.g. direct interaction of a physician with his or her patient or taking and storing test values by patient from his or her home etc. Given the importance of primary level in Estonian health care system where family doctors have the key role for patients' consulting, monitoring and referral to specialist care, it would be natural to analyze options to include part of these services in primary level package, notably for patients with chronic condition. Another interesting issue is whether personalized telemedicine services could be reimbursed in the future in line with physical medicinal appliances.

*Use of information technologies from the prospective of HIF – assessing quality of treatment*

Availability of data and increasing use of e-services will substantially contribute to overall efficiency of health care system. However, from the prospective of HIF electronic data will contribute in particular to our ability to assess the quality of treatment. Quality of health care

in general and quality of treatment in particular cases are issues that are poised to have ever increasing importance in the coming years.

Electronic comprehensive data basis facilitate assessment of quality via numerous channels. One obvious example is the ease to perform ex post checks and clinical audits, using records in prescriptions' or invoices databases. Clearly, having data stored in one place makes the whole process more efficient and easier to perform for all parties concerned.

Moreover, electronic data makes it easier to implement indicators-based quality control systems more generally. For instance, one of the indicators of performance system for family doctors envisages the assessment of whether a doctor has followed medical protocol in treating high-risk patients with high blood pressure condition. Here, central prescription database can be used to check whether all steps of the protocol have been observed.

Hypertonia is one of the main causes of avoidable death in Estonia. To address this health risk, HIF sponsored compilation of the Estonia-specific medical protocol and included the observation of protocol, including use of prescription drugs, in the family doctors' pay for performance system. Implementation of such an arrangement would have been impossible without central electronic database of prescriptions and e-prescriptions.

Looking forward, the fully operational and functional e-health system will clearly have a huge potential to be used to assess medical outcomes of treatments. For the time being, HIF uses data from its invoices' database to compute and publish around 20 quality indicators for Estonian strategic hospitals. Over time, all data used to monitoring and assessing quality of care and treatment of illnesses should become available via e-health information system, as not all relevant indicators can be derived from invoices.

*Conclusions*

Ladies and gentlemen, I would like to conclude by emphasizing once more the role and importance of electronic data storage and e-services in general in modern care.

Cutting edge information technologies are instrumental to make medical and health data easily available to all system participants – to patients, to doctors and to regulators and purchasers. Moreover, they can be harnessed to actively assist doctors in decision making, to substitute in many case out-patient face-to-facer encounters with e-services and to provide doctors with access to patients from different physical locations. And most importantly, electronic data and e-services will provide our patients with timely access to health care system and will empower them to become an integral part of care process. Taken together, this will result in more efficient use of scarce resources, better quality and improved health.

Thank you for your attention.