# Wider Implementation of Telemedicine in Estonia

**A summary of the study's results**

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## Introduction

Aging population and the rise in citizens' expectations increase the demand for healthcare services while the decrease in the workforce makes funding healthcare services continuously more difficult. That puts the system's financial sustainability under pressure and makes it difficult to maintain the quality and accessibility of healthcare services. The implementation of information and communications technology (ICT) has been seen as one possibility for making the healthcare system function better. One of the ways of using ICT is telemedicine, which simplified, means providing healthcare services from a distance. Telemedicine has been seen as one possibility for improving the healthcare system and supporting the achievement of its main goals – quality, accessibility and effectiveness.

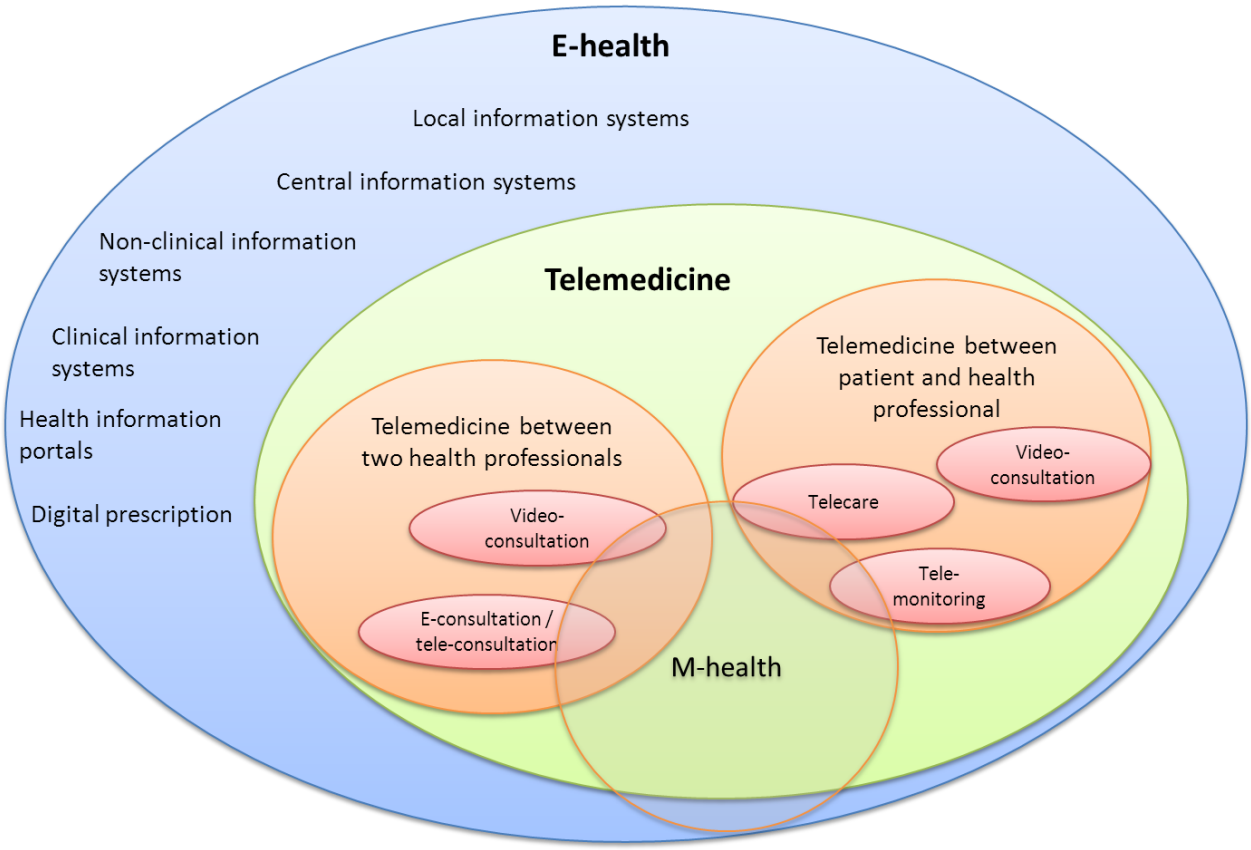
The purpose of the study was to evaluate the need, the possibilities and the preconditions of wider implementation of telemedicine in Estonia. Local and international experience in using telemedicine was mapped and primary obstacles for wider implementation identified. As a result, suggestions that cover the innovation process of telemedicine for wider implementation and a development vision of telemedicine's possible role in the Estonian healthcare system in the near future were complied.

## The Nature of Telemedicine

In healthcare, decisions are made based on the patient's health information, and sufficient, complete and timely accessibility of that information is a premise of quality service. In the case of information-based healthcare, information has to be accessible irrespective of the time and the location of the person or the healthcare specialist. Therefore, digital health data and services are an inseparable part of the healthcare specialists' everyday work.

Generalized, telemedicine means providing healthcare services from a distance. The European Commission defines telemedicine as providing healthcare with the help of ICT in situations where the health professional and the patient, or two healthcare professionals, are not in the same place, and it includes a safe transfer of medical data and information as text, audio, images or other forms to prevent, diagnose, treat and observe patients. At the same time, telemedicine can be used through different technological solutions (telephone, internet, sensors), and the participants can be patients, doctors, nurses and care-giving specialists. Telemedicine may be used in different medical fields in different phases of the treatment process: prevention, diagnoses, observing chronically ill patients, emergency care, etc. Telemedicine is directly connected to E-health. E-health can be seen as a central infrastructure (a data exchange platform with data that has already been collected) and telemedicine as a form of providing a service, which is a part of E-health and can rely on the E-health infrastructure (see the illustration below).

*Mapping of Telemedicine Terms*




Source: authors (adapted from Cocir Telemedicine Toolkit 2011)

## Goals and Benefits of Telemedicine

Telemedicine can be one of the possible components in different activities or services related to health or healthcare. Telemedicine can bring the knowledge of a specialist with more specific training (i.e. a specialty doctor) to other healthcare workers (incl. family doctors, family nurses) or patients through ICT irrespective of the participants' location.

Telemedicine can help to guide the healthcare system towards more prevention. Many of the telemedicine solutions and pilot cases in Estonia are preventative – worsening of the health problem is prevented. For example, they try to prevent the need for emergency medicine among chronic patients, discover malignant skin tumors early and prevent complications related to diabetes. Telemedicine's potential is also seen in the fact that the accessibility of medical help would improve for those who live rural areas. Faster intervention on the primary level and a faster solution to the health problem (i.e. in the case of an e-consultation service) could have a positive effect. Different telemedicine services may cover different fields (i.e. dermatology, mental health, rehabilitation) and different participants in the healthcare system (the patients, family practices, hospitals, nursing care providers).

As a final goal, implementing telemedicine should help to achieve the goals of the healthcare system – increase accessibility, ensure quality and improve effectiveness to achieve better health and quality of life for the population. The benefits of telemedicine become evident when telemedicine is implemented successfully. Next, recommendations that contribute to a successful and reasonable wider implementation of telemedicine considering the goals of the healthcare system are given.

## Recommendations for Implementing Telemedicine

1. ***Specify and standardize the definition and subclasses of telemedicine and terminology related to E-health in general. For example, the terms telemedicine, telecare, telemonitoring, e-consultation and asynchronous and synchronous telemedicine, etc. should be defined clearly and coherently. Consider the possibilities for Estonianizing the terms.***

2. ***Consider telemedicine as one possibility when developing healthcare services on different levels – strategic level, developing specialties and developing services, entrepreneurship and scientific work. Special attention should be given to training healthcare workers in the field of telemedicine and the possibilities and use of E-health.***

3. ***The state and other participants of healthcare should consider telemedicine's and e-health's possibilities to help when composing strategic plans for all healthcare fields – primary care, specialized care, nursing care, prevention and other related fields.***

4. ***Improve the possibilities for evaluating and testing telemedicine while relying on modern international practices and considering the characteristics of telemedicine compared to evaluating other health technologies (pharmaceuticals, procedures).***

5. ***Support the creation of suitable model(s) for evaluating and testing telemedicine services (incubation program), which would involve appropriate stakeholders and experts, would enable testing ideas in controlled environments and help make decisions about the usefulness of the solutions.***

6. ***Create preconditions for connecting new pre-evaluated and tested telemedicine services with the information system (creating interoperability) to ensure universal accessibility to the health data formed separately and also the possibility for using the data from the health information system when needed.***

7. ***Create an organizational model to develop and agree upon the clinical processes and technical standards of telemedicine services to enable the connection of new telemedicine services with the healthcare system smoothly.***

8. ***Develop financing model(s) for pre-evaluated and tested telemedicine solutions. Cooperation between telemedicine solution's stakeholders according to the specifics of the service is necessary when creating financing models. Input for financing decisions can come from the pre-evaluation and testing of the solutions.***

9. ***Conduct follow-up evaluations of telemedicine solutions that have already been implemented to evaluate their successfulness and discover lessons for implementing new services.***

10. ***Conduct further research on patients' willingness and possibilities for using specific telemedicine solutions. Include patients in the development process of telemedicine solutions.***

11. ***Conduct additional research on the need to regulate healthcare apps used by patients and the possibilities for interoperability with the health information system to ensure the information collected by the patient ends up in the health information system and can be used by the appropriate participants (incl healthcare workers) in a systematic and standardized way.***

12. ***Ensure all medical specialists, family doctors and family nurses have an internet connection good enough to broadcast (synchronous as well as asynchronous telemedicine) with multiple participants by video, images, audio and data.***

13. ***Support the training of specialists who could contribute to evaluating new solutions and testing, developing and implementing them both on the side of the telemedicine solutions' developer (IT/health technology company) as well as the user (the provider of healthcare service).***

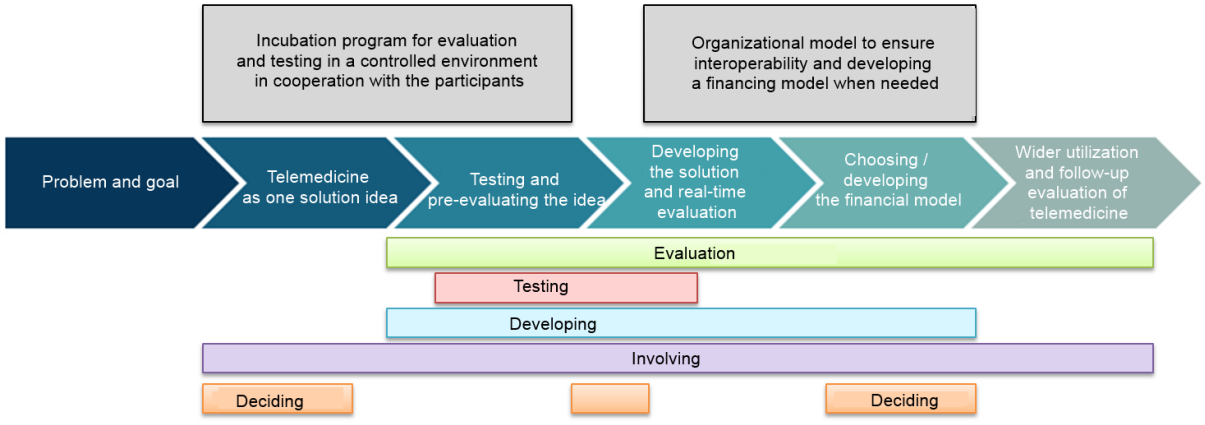
14. ***Identify the level of IT skills (both primary and secondary data use) among healthcare workers and evaluate the need for trainings.***

15. ***Improve and motivate healthcare establishments' and technology companies' closer co-operation to, among other things, ensure the spread of telemedicine's technological possibilities (ideas). The suggestion given is supported by a previous suggestion to create an environment that would allow us to evaluate and test new telemedicine services in a controlled environment (the so-called incubation program).***

16. ***Monitor the formation of new telemedicine solutions used in healthcare and the development of technology in the world and evaluate the potential of using them in Estonia so that the newest technologies and innovations could help develop the healthcare system of Estonia.***

Therefore, bringing a telemedicine solution into use implies many actions so that reasonable and beneficial solutions can be implemented. Evaluation, testing, developing, involving participants as well as making decisions about which telemedicine services should be reimbursed and how and whether they should be developed as a central service or joined with the existing system should be considered. At the same time, two organizational forms which can help support those activities can be distinguished in the model of promoting innovation in telemedicine that was created by this study (see illustration below).

*The innovation process of telemedicine with supporting activities*




Source: authors

The goal of the first organizational form, which is the incubation program, is to find out the potential benefit and need for the new solution but also limited, controlled primary testing in a healthcare environment. The goal of the second organizational form, which is the model of interoperability, should be joining pre-evaluated and tested applications with the healthcare system in regard of the interoperability of the information systems as well as service processes – standards are chosen and the

content of service processes will be decided upon with participants related to the cooperation; a connection for data transfer to and from the central health information system is also created. The selection of financing model or the creation of a new one should also take place in this phase.

The activities during the innovation process should allow telemedicine solutions in various development stages (i.e. an initial written concept or a tested and functioning service) to be included in the suitable phase. The input of a new service can come from service providers, professionals, universities and the public and private sectors.

The research also showed that different pre-conditions are necessary for telemedicine's wider implementation. Being interdisciplinary as well as the equivocation of the definition of telemedicine and the abundance of subclasses make it difficult to deal with the subject. Therefore, the primary pre-condition of telemedicine's wider implementation is developing a clear strategic plan into which all of the stakeholders of the healthcare system from the public and private sectors are included.

It is important to agree upon terminology and create better opportunities to introduce new technological solutions in health care – that primarily means increasing co-operation related to service development and healthcare management between different levels, giving opportunities in the healthcare environment to develop new services and increasing the system's flexibility as well as the participants' awareness of telemedicine's possibilities, effects, dangers and benefits.

Although most of the aforementioned recommendations require a cohesive and iterative approach, perhaps the most important activities are improving the opportunities for evaluating the telemedicine experience so far, raising awareness about the possibilities of telemedicine as well as developing the workforce as a part of follow-up training and university level. Trust in new services can be increased by further developing the existing E-health infrastructure, ensuring it works without any glitches and a reasonable and smooth management of changes. The healthcare system has many participants depending on each other, and successful involvement of participants ensures success and benefits.

## Methods of the Research

This was an interdisciplinary study where qualitative analysis methods were primarily used. First, telemedicine's terms, practices of evaluation, goals and international experiences implementing telemedicine were described on the basis of a literary overview and document analysis. After that, Estonia's current state of telemedicine was mapped in the course of interviews and documentation-based case analysis. In addition, healthcare service providers participated in a questionnaire (310 answers out of 1350 population) to evaluate their views on the need and preconditions of implementing telemedicine. Finally, primary obstacles to implementing telemedicine were identified, and by synthesizing the aforementioned, recommendations to overcome those obstacles and reach reasonable implementation of telemedicine were developed.