



The Final Report of ICT for Health Project

Strengthening social capacities for the
utilisation of eHealth technologies in the
framework of ageing population

Imprint

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Project at a glance

- 19 project partners
- 8 Baltic Sea Region countries
- EUR 3.65 million budget
- Part-financed by the European Union Baltic Sea Region Programme 2007-2013
- Lead partner: Flensburg University of Applied Sciences
- Flagship project: ICT for Health has been integrated into the action plan of the EU Baltic Sea Strategy by the EU Commission. This decision ensures strong political involvement.

Project messages

- A better and wider acceptance of ICT is central to ensuring future healthcare provision in the partner regions of the Baltic Sea Region.
- ICT for Health shows that eHealth is a user-friendly, safe and cost-effective way to improve the quality of life of the ageing population.
- ICT for Health demonstrates how to effectively enhance the acceptance of eHealth on the part of patients, health professionals, and policy-makers.
- ICT for Health indicates how ICT solutions empower patients to take more responsibility for their own health.

1. Editorial

In the last three years, the international project ICT for Health has focused on achieving acceptance of information and communication technology (ICT) in the European health sector. As the population is ageing, the number of people with chronic diseases, especially elderly people, throughout the Baltic Sea Region is increasing. This presents great challenges both for the well-being of the public and for the public healthcare systems. Healthcare systems provided by ICT, also known as eHealth, offer one solution to this problem.

This Final Report is addressed to all those who are interested and involved in the development of eHealth – whether patients, medical professionals or stakeholders. The report presents the results of our extensive activities and demonstrates the potential for increasing acceptance of eHealth by the public, by medical professionals and by policy-makers who wish to integrate ICT into healthcare.

The implementation of the project was divided into several working groups: Our focus was on strategies to improve acceptance of eHealth technologies. In addition, we have developed and implemented technical solutions and standards for transnational eHealth applications. Finally we have developed modules on eHealth education.

2. Why “ICT for Health”?



ICT for Health presents solutions.

persuade both patients with chronic diseases and medical professionals in the partner regions to accept eHealth more readily, and to provide the capacity and knowledge for the use of eHealth technologies in the prevention and treatment by the end of the project year 2012.

Transnational exchange of experiences between the partner regions

During the project period the participating regions have compared and exchanged their national, regional and local strategies for improving the ability of the public and medical professionals to utilise eHealth technologies for better prevention and treatment in the context of an ageing population.



Prof Roland Trill, Leadpartner.

A wider acceptance of ICT is central to ensuring future healthcare provision in the partner regions in the Baltic Sea Region. The project has demonstrated how acceptance in the defined target groups may be enhanced and indicated how eHealth solutions can empower patients to take more responsibility for their own health.

Increased awareness on eHealth among medical professionals and citizens

A number of medical professionals and citizens with chronic diseases have been educated and trained to use eHealth technologies to help prevent and treat chronic diseases. This has been achieved by implementing an educational pilot programme in some of the participating regions.

Increased patient responsibility for their own health

In the pilot programme regions, citizens with chronic heart disease have applied self-monitoring technologies for secondary prevention and treatment processes, in collaboration with medical professionals. In addition to this self-monitoring process, citizens have tested a web-based eLearning tool that provides lifelong learning materials on the prevention and treatment of chronic diseases. The pilot programme has focused on chronic heart disease, by way of example, but may also prove to be applicable to other chronic diseases.

Improving the mobility of citizens with chronic diseases

A number of citizens with chronic heart disease have participated in a pilot programme to test a multi-lingual electronic health records. The relevant data is self-recorded by the citizens with chronic diseases. An electronic health record improves the mobility of citizens with chronic diseases by making it easier and safer to travel through neighbouring European countries on business trips or holidays.

3. Dimensions of eHealth Acceptance

The project partners have identified seven factors as being central for improving the acceptance of eHealth. These factors formed the basis of an online debate carried out on the project's social media platform. Below are some of the entries posted in the debate.

- What is **eReadiness** and what role does it play in eHealth?

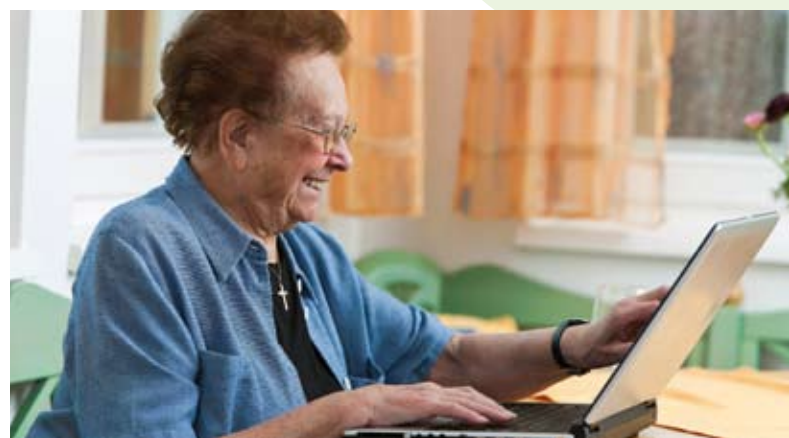
In the ICT for Health project, we see eReadiness as an important precondition for greater acceptance of eHealth. This is something we have dealt with directly by creating the eLearning programme SALUDA, which provides citizens with education about their disease as well as with information on how to improve their quality of life by adjusting their lifestyle. How do you perceive eReadiness and how important do you think it is for eHealth acceptance?

- What role does the **credibility of healthcare providers** play in the acceptance of eHealth? eHealth offers a great number of new possibilities in healthcare, but in order for us to make the most of it, we are required to change the way we provide and receive healthcare and thus the relation between healthcare providers and patients. Does eHealth risk damaging the credibility of healthcare providers by allowing for the provision of healthcare over long distances and via new technology?



- **Usability** is a key factor for the future of eHealth. In the development of new and existing eHealth solutions, aspects such as ease of use, simplicity, and intuition must be taken into consideration. Everyone in this group has had experience with eHealth in some way. How would you rate usability in your work?
- When developing eHealth solutions for citizens and medical professionals, it is crucial to listen to the users and to find out how they **perceive the usefulness** of the solution. Their input can be a decisive factor when deciding whether the solution becomes a success or not. Do you have any experience with the subject of perceived usefulness?
- **User privacy and data security** play an important role for the application of eHealth solutions. However, the perception of their specific definition and importance depends on the data in question, the solution itself, and even cultural differences. How do you perceive user privacy and data security and how do you handle this in your work?

- For eHealth solutions to function in real life, they need to be trustworthy for all users, health professionals as well as citizens who all rely on the **integrity and correctness of the data**. How do you ensure that data are of a high quality and live up to the necessary standards?
- The demographic challenge faced by many countries today renders the dimension '**cost-effectiveness** of eHealth' particularly relevant. EHealth is necessary to provide us with better solutions for healthcare whilst at the same time helping us to save money. What's the situation in your country?



eHealth should be easy to use.

4. Web-based tools – developed by the project partners

SALUDA

The eLearning program and electronic record for citizens with chronic heart disease is an instrument for improving the quality of life.

<http://www.saluda-asd.de/en/>

Vivaport

The multilingual personal health portal supports cross-border healthcare and allows for the collection of vital data for selfmonitoring.

<https://vivaport.eu/>

Benchmark atlas

- Focus on demography
- Focus on chronic diseases

This interactive online system provides an overview of the predicted development of eHealth related indicators in the countries of the Baltic Sea Region.

http://www.ictforhealth.net/index.php?option=com_wrapper&view=wrapper&Itemid=65

eHealth for citizens portal

The eHealth portal for citizens uses realistic scenarios to show how eHealth could support patients with chronic diseases in mastering their daily life.

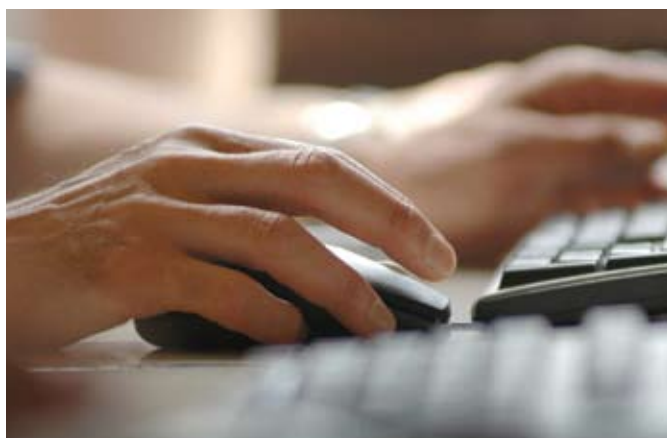
www.ehealth4citizen.eu



5. Pilot runs

5.1 Comprehensive self-monitoring system for chronic heart failure patients

Work Package Coordinator: Werner Smidt, European Forum of Telemedicine e. V., Germany



Self-monitoring for patients with chronic diseases.

Chronic heart failure affects 2 to 5% of the population between the ages of 65 and 75 years, and is particularly prevalent among older people. The rates of re-admission are also among the highest for all common conditions in Europe. The early detection of symptoms of deterioration allows timely intervention and may prevent hospitalisation. Deterioration can be detected using relatively simple measures such as blood pressure and weight. Telemonitoring systems enabling remote patient self-monitoring and relay of information to clinicians can potentially improve the integration between self-management and professional support, facilitate intensive monitoring and aggressive intervention for those most at risk, provide automated alerts and reminders, and change the way people with long-term conditions self-manage and interact with primary care. Essentially, self-monitoring should be carried out by patients themselves, using simple equipment and documentation, but this is often not happening.

Method

We have developed a new three-step eHealth approach.

- Step 1: The patient receives an electronic scale and a blood pressure device. The vital parameters are automatically transmitted to the transnational virtual monitoring centre. The partner hospitals from Vilnius (LT), Kaunas (LT), Seinäjoki (FI), Hässleholm (SE) Oslo (NO), Leborg (PL), Flensburg (DE) and Bad Segeberg (DE) have access to the data base. The tele-nurses of each hospital contact the patient by telephone if one of the vital signs exceeds the alarm limit.
- Step 2: Patient education with a new eLearning program, SALUDA (Self Active Learning Under Demographic Aspects). The patient learns about their chronic disease and is shown how s/he can influence the disease by changing their life style and behaviour. The eLearning program SALUDA is available in six languages under www.eift.eu and is free of charge.
- Step 3: At this stage patients understand the benefits of taking daily measurements and have learned more about the impact of managing these themselves. They should continue taking measurements using normal scales and a blood pressure device. The measurements are documented in the SALUDA EPR (electronic patient record).

Outcome

We measured the outcome and effectiveness within a clinical trial. We enrolled 377 patients with an ejection fraction below or equal 45%. The patients were divided into three groups. Patients without internet access (n=206) were put into group 1. They were treated with standard care. The group 2 patients (n=67) were advised to use the eLearning program and the electronic patient record. The group 3 patients (n=104) did the same as group 2 but they also had tele-monitoring service at the beginning. The first evaluation included 193 patients. Hospitalisation fell from 64% in the previous six months to 27.5% during the six-month observation period of the study. Visits to hospital emergency departments decreased from 31.4% in the six months prior to the study to 8.8% during the six-month study period.

Conclusion

Remote monitoring and the eLearning program were very positively accepted, while the EPR was less popular. Patient motivation declines over time. Patients need regular personal contact. There are now devices on the market which can transmit measurements directly into a patient's iPad which then sends a weekly summary to the treating centre. This offers a good combination of self-monitoring and remote check-ups.

5.2 Multilingual personal health portal enabling citizens with chronic diseases to electronically document their health data, thereby supporting their mobility abroad

Work Package Coordinator: Prof Dr. Arūnas Lukoševičius, Kaunas University of Technology, Lithuania



Multilingual health portal for travelling citizens.

and managers. The needs of patients and the ability to integrate information from PHRs in partner countries was analysed using dedicated questionnaires. The principles and details of implementation, including the main internet and mobile phone technologies, were discussed in detail with experts and stakeholders. Answers were formulated to 53 frequently asked questions about the portal architecture, functions, management and maintenance. At the next stage of portal development, the pilot version of the user interface was developed and tested using agile software development methods. All suggestions were collected, discussed and implemented in the new test version of the portal. The third stage of portal development saw the implementation of the fully functional version for final tests. The portal domain www.vivaport.eu was registered and a multilingual portal was tested with patients in five partner countries, using an automated PS translation and mobile phone access.

As the use of internet and mobile communication technologies is increasing, and people are able to access health-related information quite easily, the number of patients actively monitoring their own health also is increasing. Therefore the challenge to be met is how best to integrate the personal health records, owned by each patient, with portals managing these records. In order to facilitate the secure mobility of patients/citizens with health risks in the Baltic Sea Region, a multi-lingual personal health portal for the cross-border sharing of vital health information – Patient Summary (PS) – was defined as a chief goal of the pilot project.

Method

Comparative analysis of the best existing solutions, EU Directives, current Electronic Health Record (EHR) projects, and eHealth standards was undertaken, with the aim of finding the best conceptual and architectural solution for a portal which meets the needs of all stakeholders – citizens/patients, formal and informal carers, physicians

Outcome

A fully functional portal with following innovative features has now been developed:

- A multi-language portal for cross-border travel by people with health risks, for which there were no other real working prototypes on the market.
- New software tools for the multi-language translation of the portal interface, medical records (PS) and classifiers, allowing online working.
- Implementation of portal registration by the use of mobile phones and SMS messages. This innovative feature makes for much more convenient accessibility by patients.
- Implemented functionality to enter health parameters by phone and registered iPhone and Android applications enabling the upload of essential health monitoring data and observations to the portal.
- Portal architecture and technological tools enable future evolution of the portal into new countries, using additional languages, integration with eHealth systems and EU project epSOS developments, and the expansion of PS towards EHR.
- Elaborated usability test for evaluation and research of portal acceptability and patient readiness.

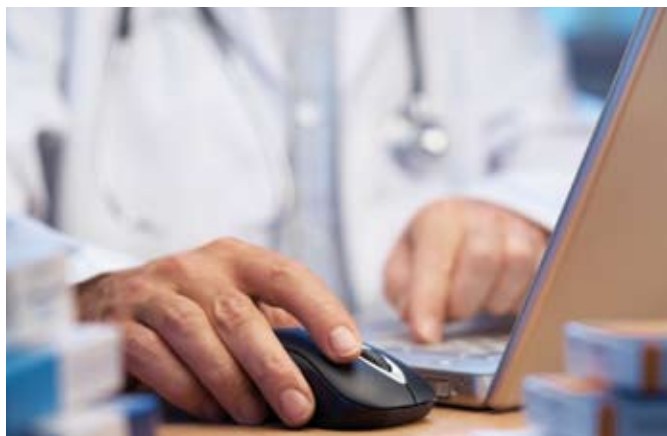
Conclusion

The portal offers an important tool in increasing awareness of eHealth technologies, thus meeting the main goal of the project. Portal usage and test scenarios enable pilot usage in the real environment in every partner country, allowing partners to compare experiences and find ways to solve the cross-border problems of health communication in the Baltic Sea Region.

Implemented functionalities of the portal substantially increase the safety of patients with health risks while travelling, ensuring access to vital information wherever they are, and thus diminishing the risk of adverse health events occurring. The portal concept is ideal for the promotion of eHealth and the empowerment of patients to take more care of their own health, in changing their lifestyles and becoming more aware of their health status and its long-time implications.

5.3 Educational content for better utilisation of eHealth by medical professionals and citizens

Work Package Coordinators: Helli Kitinoja, Seinäjoki University of Applied Sciences, Seinäjoki, Finland and Prof Alfonsas Vainoras, Lithuanian University of Health Sciences, Lithuania



The transfer of knowledge about eHealth should be integrated in the education of the future healthcare professionals.

courses for students, teachers, the general public and chronically ill. This is why the work package has developed modules for the different target groups, including teaching courses for Bachelor and Master degree students and lecturers, as well as guidelines for the public. These courses have been held by the participating partner organisations.

The main aim of education in eHealth is to implement ICT skills in healthcare practice. There is a clear need to educate healthcare professionals and train them to use eHealth applications. The intention is to provide a framework that supports and directs the development of courses for healthcare professionals within the eHealth sector. The aim has been to reflect and to take into account: (a) knowledge about new technologies that can be applied in the caring processes for elderly and chronically ill patients; (b) developing skills in using these technologies; and (c) the ability to apply knowledge and skills to specific patient problems in ways relevant to each student. It is vital that healthcare professionals are well-trained in eHealth so that they can systematically process data, information and knowledge in medicine and healthcare. It is only through the improved education of healthcare professionals and through an increase in the number of well-trained workers in eHealth that the current lack of knowledge and associated skills can begin to be reversed.

Exchanging the varied experiences in different European countries can help to overcome difficulties in the preparation of teaching

6. Project publications in the field of Strategies to improve the social capacity of citizens and medical professionals to utilise eHealth technologies

- **Role of ICT**
Strategies to improve the social capacity of citizens and medical professionals to utilise eHealth technologies
- **Concept benchmark system**
Concept of the ICT for Health atlas, which provides an overview over the predicted development in eHealth-related indicators in the countries of the Baltic Sea Region.
- **Examples of good practice use of ICT in healthcare and its potential transferability**
Cases focusing on the treatment of elderly people suffering from chronic diseases in the project partner regions.
- **Impact of demographic change**
Report on demographic and epidemiological development and possible effects on the level of supply and quality of services.

7. Project publications in the field of Education for healthcare professionals and citizens with chronic diseases to utilise eHealth technology



How to learn eHealth.

- **Concept of the Joint European Multidimensional Master's Programme in eHealth**
Concept for the development of a master's programme, its target groups, learning objectives, and relevant modules.
- **Self-learning (web-based) material for citizens with chronic diseases, part A: Introduction and overview**
Introduction to the eHealth field, describing the context of its emergence and the different forms of technologies and services it involves.
- **Self-learning (web-based) material for citizens with chronic diseases, part B: Interview guide for elderly citizens and for patients with heart failure**
Three interview guides for assessing eHealth acceptance for citizens enrolled in the SALUDA programme in the Baltic Sea countries of Germany, Norway, Sweden, Lithuania, and Finland.
- **eHealth evaluation concept and suitable indicators**
Health service research study concept for the evaluation of eHealth applications.
- **How to teach eHealth**
Report on learning approaches and trends of e-Learning in eHealth.
- **Baseline study of eHealth in education in the Baltic Sea Region**
Extent, level and content of eHealth in the existing formal educational systems in Lithuania, Germany, Finland, Norway and Denmark.
- **A proposal of standards for eHealth education transnationally**
ICT, self-management and care in an ageing population.
- **Module for teachers**
Possibilities and benefits of eHealth. A structured eHealth module for teachers. Third part of the multidimensional eHealth modules for students and teachers.
- **Module for BA students**
Multi-dimensional eHealth modules for students and professionals based partly on virtual learning methods and the summer school concept.

8. eHealth Acceptance Conference



Discussion on eHealth Acceptance.

5th-6th November 2012. Brussels, Belgium.
Venue: Hotel Silken Berlaymont. 120 participants.

The eHealth Acceptance Conference 2012 put the issue on the political agenda. In three key lectures, four thematic sessions and one panel discussion, central issues on eHealth acceptance were discussed. The results achieved during the project period were presented.

This event brought together policy-makers, health sector professionals, patient associations, universities and relevant industries from the Baltic Sea Region as well as from the European area. Project partners and stakeholders received helpful information about the measures taken by regional healthcare organisations and administration.

Aims

- To put eHealth acceptance issues on the political agenda.
- To discuss the recommendations of the project.
- To discuss how the utilisation of eHealth technology in the BSR can be enhanced.
- To inform the target groups about the tools and possibilities delivered by eHealth.
- To bring together stakeholders from politics, the health sector, patient associations, universities and industry from the BSR and the EU, to discuss cross-sector eHealth acceptance.
- To discuss the results of the transnational benchmark system on an ageing population and its influence on chronic diseases.
- To raise awareness of the opportunities for transferring good-practice in the partner countries to improve public use of eHealth technologies.
- To present the results achieved during the ICT for Health project implementation period.
- To show the uniqueness of the approach.



Acceptance of eHealth – how can it be enhanced?



Talk about good practices of eHealth.

Target groups

- National and regional decision-makers from politics and health sectors.
- Members of the EU Commission, SANCO.DG.02 - Innovation for Health and Consumers. DG Health and Consumers.
- Members of the EU Parliament.
- eHealth experts from universities.
- Patient associations.
- Other general stakeholders from industries such as medical technology.
- Political Strategic Board of the eHealth for Regions network.
- Project partners and colleagues from partner organisations.

Thematic sessions

- eHealth in the regions: strategies and good practice
- Patient empowerment through lifelong learning and self-monitoring
- From ICT skills towards eHealth practice!
- Enabling access to multilingual personal health records in the Baltic Sea Region

For further information, please visit
<http://www.ehealthacceptance2012.net>

Selection of speakers

- Alexander Britz, Microsoft Deutschland GmbH
- Henning Bruun-Schmidt, Cetrea - clinical logistics, Aarhus, Denmark
- Petra Leroy Čadová, Unit on Innovation for Health and Consumers Directorate-General for Health and Consumers (DG SANCO) European Commission
- Nena Georgantzi, Age Platform Europe
- Aigars Miežitis, Northern Dimension Partnership in Public Health and Social Well-being (NDPHS)
- Abderrahman Machraoui, Diakonissen-Hospital

9. Project partners

Denmark

- Aalborg University, Department of Development and Planning
- North Denmark Region
- Region of Southern Denmark

Finland

- Regional Council of South Ostrobothnia
- Seinäjoki University of Applied Sciences
- South Ostrobothnia Healthcare District

Germany

- Flensburg University of Applied Sciences
- Diakonissen-Hospital Flensburg
- European Forum of Telemedicine e. V.
- Institute for Cancer Epidemiology at the University of Luebeck
- County Council of Segeberg
- Association Health Forum Segeberg

Lithuania

- Lithuanian University of Health Sciences
- Kaunas University of Technology
- Vilnius University Hospital Santariškių Klinikos

Norway

- Diakonhjemmet Hospital

Poland

- City Hospital Leborg

Sweden

- Hässleholm Hospital

Russia

- Pavlov State Medical University, St. Petersburg



The project partners worked together during three years.

www.ictforhealth.net