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Report on health care organisation in the partner regions and the role of ICT in prevention and treatment of chronic diseases

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WP no.: 3

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Short Abstract

This report presents the role of ICT in prevention and treatment of chronic diseases in the participating countries: Denmark, Germany, Lithuania, Finland, Poland and Sweden. Based on the national and regional geographic and population data, the organization of the health care systems, their classification, and financing is described.

Further, the report shows the actual status of the application of ICT in health care and exposes national standards and roadmaps in the use of ICT in supporting and impacting the health sector. The partner regions describe their eHealth strategies and give examples of ICT-implementation.

In combination with the report 3.4.1 Examples of Good Practice Use of ICT in Healthcare and its potential Transferability, this report pictures the status quo of ICT in health and points to future deployment in every participating country and region.

With this report, it is the hope to reach important target groups - medical professionals, politicians, and also the citizens; they will influence the deployment of using ICT in health care, especially focusing on the demographic change including the rising burden of chronic diseases.
Content

Introduction ........................................................................................................................................ 1

1 Denmark ......................................................................................................................................... 3
  1.1 Denmark – Background and Statistics .................................................................................... 3
  1.2 Health Care Organisation ........................................................................................................ 4
    1.2.1 Health Care Organisation in the North Denmark Region .............................................. 4
    1.2.2 Health Care Organisation in the Region of Southern Denmark .................................... 5
  1.3 eHealth Strategies .................................................................................................................... 7
    1.3.1 eHealth Strategies in the North Denmark Region ............................................................. 7
    1.3.2 eHealth Strategies in the Region of Southern Denmark .................................................... 9
  1.4 The Role of ICT in Prevention and Treatment in Denmark .................................................... 13
    1.4.1 The Role of ICT in Prevention and Treatment in North Denmark .................................. 15
    1.4.2 The Role of ICT in Prevention and Treatment in the Region of Southern Denmark ...... 17

2 Finland ........................................................................................................................................... 19
  2.1 Finland and the Region of South Ostrobothnia – Background and Statistics ...................... 19
  2.2 Health Care Organisation in Finland and the Region of Ostrobothnia .............................. 19
  2.3 The Role of ICT in Prevention and Treatment of Chronic Diseases in Finland and the Region of South Ostrobothnia ........................................................................................................ 21

3 Germany ....................................................................................................................................... 25
  3.1 Germany - Background and Statistics ..................................................................................... 25
  3.2 Health Care Organisation in Germany ..................................................................................... 25
  3.3 The Role of ICT in Prevention and Treatment of Chronic Diseases in Germany ................ 28

4 Lithuania ........................................................................................................................................ 33
  4.1 Lithuania - Background and Statistics ..................................................................................... 33
  4.2 Health Care Organisation in Lithuania ................................................................................... 33
  4.3 The Role of ICT in Prevention and Treatment of Chronic Diseases in Lithuania ................ 35

5 Sweden ........................................................................................................................................ 43
  5.1 Sweden and the Region of Skåne - Background and Statistics ................................................ 43
  5.2 Health Care Organisation in Sweden ....................................................................................... 43
  5.3 The Role of ICT in Prevention and Treatment of Chronic Diseases in Sweden ................... 44

6 Poland .......................................................................................................................................... 48
  6.1 Poland and Pomeranian Voivodeship - Background and Statistics ........................................ 48
  6.2 Health Care Organisation in Poland ......................................................................................... 48
Output No. 3.3.1
Report on health care organisation in the partner regions and the role of ICT in prevention and treatment of chronic diseases

6.3  eHealth Strategies in Poland........................................................................................................... 52
  6.3.1  The national eHealth projects................................................................................................... 53
6.4  The role of ICT projects in prevention and treatment of chronic diseases in Poland........ 54
7  Conclusions........................................................................................................................................ 58
8  List of References................................................................................................................................. 59
9  List of abbreviations........................................................................................................................... 62
Appendix 1: Quality Review Note .......................................................................................................... 63
Appendix 2: Checklist Editing ................................................................................................................ 64

List of tables

Table 1: Total general government expenditure on health care by country, 2005-2009 (% of GDP in million euro 2009) ......................................................................................................................... 2
Table 2: EuroHealth Consumer Index 2009............................................................................................ 2

List of figures

Figure 1: Organisations providing primary health care in the sub-regions of South-Ostrobothnia ........................................................................................................................................... Fehler! Textmarke nicht definiert.
Figure 2: The health care system in Poland.......................................................................................... 48
Introduction

Applications in information- and communication technology (ICT) offer new and exciting opportunities to empower individuals and groups in relation to their health, to significantly enhance the quality of the delivery of health care, and to address inequalities in people’s access to health information and services. In order to ensure these results, however, the use of these technologies must be managed and directed appropriately and technological tools must be made equitably available.

Because of demographic changes, an increased burden of chronic diseases, and expensive treatments challenge the healthcare systems in the Baltic Sea Region (BSR), the development of new cost-efficient, reliable, and interconnected systems becomes crucial.

Table A¹ shows the increasing general government expenditure on health from 2005 until 2009 in the countries presented in this report, measured in terms of the Gross Domestic Product (GDP).

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<th>Expenditure in % of GDP</th>
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Table 1: Total general government expenditure on health care by country, 2005-2009 (% of GDP in million euro 2009)

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<th>Country</th>
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There are different existing approaches to fighting increasing expenditures in the health care sector; one of them could be the deployment of information- and communication technology (ICT). ICT technologies should lead to higher cost-efficiency in the health care sector and allow a mutually beneficial collaboration between patients and medical professionals in prevention and treatment.

Trying to show the penetration of eHealth, the EuroHealth Consumer Index 2009\(^2\) determined amongst others an eHealth-ranking\(^3\) of the European countries. The maximum reachable score was 75. Those countries who are presented in this report reached the following results:

Table 2: EuroHealth Consumer Index 2009

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<th>Country</th>
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But what are the differences between the countries when it comes to implementing and using eHealth and what do they have in common? This report focusses on strategies and policies regarding the use of ICT and describes how health care is organised in each partner country and/or region and subsequent the eHealth or ICT strategies of the countries and/or regions. The last section of each region focuses on a description of the role of ICT in prevention and treatment of chronic diseases.

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\(^3\) It was asked for a) EPPR penetration b) e-transfer of medical data between professionals c) Lab test results direct to patients via e-health d) on-line booking of appointments e) on-line access to personal care costs (by insures) and f) e-prescriptions
1 Denmark

1.1 Denmark – Background and Statistics

Denmark consists of 5.6 million inhabitants with a population density of 126 inhabitants per square kilometre – the country covers an area of 43.098 square kilometres. Around 85% of the inhabitants are living in cities, with one million in the capital, Copenhagen. Denmark is divided into five regions and 98 municipalities. The regional level in Denmark is constituted of five regions:

- Capital Region of Denmark
- Region Zealand
- Region of Southern Denmark
- Central Denmark Region
- North Denmark Region

The regions consist of 0.6-1.6 million inhabitants. In terms of surface, the smallest region, the Capital Region of Denmark, covers 2,561 square kilometres, whereas the largest, the Central Denmark Region, covers 13,142 square kilometres.

The governing bodies of the regions are the regional councils. The regional councils are each composed of 41 members directly elected for four-year periods. The regional council is headed by a president who is elected by the regional council members.

The regional council elects an executive committee with 11-19 members. The regional council can decide to establish ad hoc committees to assist and advise the council in its work. All regions in Denmark are in charge of the main aspects of the health care sector, which includes the provision of health care supply by hospitals, psychiatry, and the primary sector.

The municipalities are responsible for the rehabilitation and general prevention, but the responsibility for rehabilitation for patients in hospitals is shared between the regions and the municipalities.

Visits at general practitioners are free of charge. Patients can get subsidies for medicine, dental care, medical travel insurance, and treatments by chiropractors, physiotherapists, psychologists, etc. There are two sources of financing for the regional health expenses: the state and the

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4 [www.wikipedia.org](http://www.wikipedia.org)
5 [http://www.regioner.dk/In+English/Regional+Denmark.aspx](http://www.regioner.dk/In+English/Regional+Denmark.aspx)
1.2 Health Care Organisation

Below, the health care organisation in the North Denmark Region and the Region of Southern Denmark is described.

1.2.1 Health Care Organisation in the North Denmark Region

The North Denmark Region is one of five regions in Denmark. It consists of eleven municipalities. With its 579,000 citizens, the region is the smallest with regards to the population. The budget of the North Denmark Region is approximately 10.9 billion DKR (€ 1.46 billion) and 14,500 people are employed in the region, and over 90% of them are working in the Health Care Sector.

The hospitals in North Denmark have 36 of the 38 Danish medical specialities and offer most types of treatments. In particular, Aalborg Hospital’s status as part of Aarhus University Hospital is of great importance to the high standard the regional hospitals possess. From 2013, the hospitals in the region will be co-operating with Aalborg University (located in North Denmark Region) instead of Aarhus University, because of the decision that the local university is educating its own medical students.

Hospitals

There are five hospitals at eleven locations with a total of 1,800 beds. Approximately 8,700 employees are working in the hospitals. The pre-hospital force consists of 50 ambulance alert units.

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6 [http://www.rn.dk/Regionen/English/Organisation.htm](http://www.rn.dk/Regionen/English/Organisation.htm)
Psychiatry
The psychiatry in the North Denmark Region offers various treatments for citizens with severe mental disorders who need more specialized treatment. The psychiatry in the North Denmark Region consists of two psychiatric hospitals, three local departments, and the district psychiatry.

Primary Sector
The primary sector ensures health care from general practitioners as well as specialists without any costs for the citizens. Subsidies are also provided for medicine and for treatments by dentists, physiotherapists, chiropodists, chiropractors and psychologists.

Chronic Diseases
The region is obliged to make health care agreements with the municipalities in the following fields:

- Discharge pathways of treatment for ailing senior patients
- Admission pathways for treatment
- Rehabilitation
- Assistive devices
- Prevention and promotion of health – including patient focused prevention
- The effort towards citizens with mental disorders

In that context the region has made an agreement with the eleven municipalities in the region to establish an organization to deal with patients with selected chronic diseases. The organization consists of the so-called cross-sectorial groups – one for each chosen disease. The intention is to describe and organize the flow of the citizens/patients suffering from chronic diseases from their own home to the GPs, the hospitals, and back to their home again in such a way that it is efficient and convenient for the patient. In the groups there are representatives for the GPs, the hospital professionals, and the nurses in the municipalities.

1.2.2 Health Care Organisation in the Region of Southern Denmark

The Region of Southern Denmark is the largest workplace in the region, employing around 25,000 people. Measured in turnover, the Region of Southern Denmark administers an annual budget of DKK 20.3 billion.

7 Information for this chapter taken from http://www.regionsyddanmark.dk/wm230811
The Region of Southern Denmark’s mission in the area of health is:

- to achieve the highest possible level of health for citizens
- to act as the guarantor for a good, coherent health service
- to continue to develop the balance between specialist functions and decentralised, sustainable hospitals.

The Region of Southern Denmark’s vision for the area of health is:

- a coherent and patient-oriented health service
- a contemporary and quality-conscious health service
- an efficient and competitive health service.

The Region’s assignments are practices (general practitioners, dentists, etc.) and hospitals and prioritise the various areas of treatment and establish principles for the management of hospitals, quality assurance, service levels, etc. The region has responsibility for the cooperation between the hospitals and private medical practices.

On account of their responsibility for prevention, rehabilitation, and subsequent care at home, and their share in the joint financing system, the local authorities are key partners in the area of health.

The region is responsible for psychiatric treatment itself, while the local authorities have formal responsibility for the social psychiatry services – with the region as an active and visible partner.

**Psychiatry:**

The vision for the area of psychiatry is:

- to develop the psychiatric services available on the basis of the fundamental concepts of quality, coherence and a high level of accessibility in dialogue with patients and relatives
- to optimise the available psychiatric resources through innovative and research-based initiatives that contribute to professional development both regionally and nationally
- to continue to develop a culture that promotes happiness and development opportunities for the individual, and which generates confidence in the area – among patients, citizens, employees and partners.

By arrangement with the local authorities, the region runs seven social psychiatry institutions of a highly specialised nature. Some of the services are intended for people with eating disorders, oth-
ers for people with serious mental disturbances or substance abuse problems, and still others have a broader scope. However, all the services involve the option of 24-hour care, and most offer places in day-care or support centres.

1.3 eHealth Strategies

In June 2010, the government and Danish Regions signed a new agreement on eHealth. The agreement was meant to secure a more clear and binding direction for the development of eHealth. Among other things a new organisational structure was created with a clear division of labour between state and regions. According to the agreement the division of labour is as follows:  

The state has the responsibility of establishing national standards, implementing transversal initiatives, secure that the development of IT is done in accordance with the IT-strategy of the health care sector, and a cohesive data-and-architecture. This is conducted by the National Board of eHealth (NSI), under the Ministry of Health.

The Regions have the responsibility of consolidation, development, and operation of eHealth at the hospitals, including the electronic patient records. To ensure that the Regions share the responsibility, the Regions have established RSI (eHealth organisation of the Danish Regions - Regionernes Sundheds-IT). The regions are adopting the strategies from RSI and are working in cooperation with RSI.

1.3.1 eHealth Strategies in the North Denmark Region

The North Denmark Region has developed the organization-wide IT strategy 2014. The IT strategy supports North Denmark Region's overall 2014 strategy as well as the 21 benchmarks established by the Regional Health Care IT (RSI). North Denmark Region's strategies are gathered on this website: [http://www.rn.dk/Regionen/Strategier/](http://www.rn.dk/Regionen/Strategier/)

In 2010 and 2011, a national telemedical strategy was developed under the framework of the eHealth organisation of the Danish Regions (RSI). The Telemedical Strategy lists 24 recommendations. There are both general and specific recommendations in five focus areas. These recommendations are a natural extension of the initiatives in the telemedical field, which the
North Denmark Region has worked with over the past years, and which will continue to be a part of the North Denmark Region’s future initiatives in telemedicine. North Denmark Region already meets many of the recommendations. An example of a recommendation in relation to communication between hospital and patient is TeleCare North, a project, which in the first phase will implement telehomecare on a large scale to COPD patients.

**TeleCare North**

The purpose of the large scale project TeleCare North is to provide the COPD patient a satisfactory professional treatment, rehabilitation and care, whilst a number of specific benefits are realized, including fewer hospital days, fewer readmissions, less outpatient visits and more available time among the clinical staff and municipal caregivers. Furthermore, it aims to provide the best foundation for people with chronic disorders to develop patient empowerment, high quality of life and master the life they have. TeleCare North must find solutions and accumulate experience, which links more technical options that can be focused to patients with other chronic diseases.

TeleCare North works across sectors, not only for the patient but also with the patient. The project supports patient empowerment, defined as increased patient welfare and satisfaction, enhanced skills for self-care in their own homes and an increased influence on their own condition. Based on telehomecare, adjustment and control, the best possible state of health is maintained and the patient is equipped to act actively in relation to their own illness and health care, and thereby support the health centres’ rehabilitation efforts by maintaining a good lifestyle.

TeleCare North must ensure a professional treatment and care for the COPD patient, whilst a number of specific benefits are realized, including fewer hospital days, fewer readmissions, less outpatient visits and more available time among the clinical staff and municipal caregivers.

The ambitious target for TeleCare North is to provide telehomecare for all COPD patients in North Jutland who can benefit from this solution - regardless of which municipality, hospital or general practitioner they are associated.

The Telecare North project is anchored in the department for Health and Consistency in Northern Jutland.

8 http://www.nsi.dk/Maal-og-Milepaele.aspx
The model for chronic diseases in North Jutland

Department for Health and Consistency in North Jutland and a cross-sectorial fora for each disease group is part of the model for chronic diseases in North Jutland. The model is specified in a series of health agreements based on preliminary studies from work groups and discussions between the parties. The basic idea is to define the most suitable patient care. The parties agree on a sharing of responsibility for the activities of the effort, and each party is required to organize and implement their own activities in relation to current national professional guidelines / instructions and the level of service prioritized by each party. The cross-sectorial fora provides the healthcare aspect of the effort and have an advisory function in relation to it. The North Jutland Chronic Unit fulfills a coordinating role in the joint effort between hospitals, municipalities and general practitioners to ensure the most suitable patient care as possible. Based on the disease-specific health agreements on 9 concrete disease areas, it is the responsibility of Department for Health and Consistency to coordinate and encourage a close cooperation between municipalities, regions, general practitioners and hospitals.

1.3.2 eHealth Strategies in the Region of Southern Denmark

The Region of Southern Denmark has adopted a strategy for the use of ICT in the health care sector. The eHealth strategy identifies 21 focus areas where ICT is to support essential objectives of the health care sector. Generally, the eHealth strategy benefits and focuses on every actor involved in the health care sector. However, the strategy also targets specific areas particularly aimed at patients suffering from chronic diseases.

Telemedicine: As other forms of treatment and care supported by ICT, telemedicine is to make it possible to support the goals set for the entire health care system in the region. Thus, telemedicine is not to be understood as a special application of ICT, but as an expansion of the already known application in a way that creates greater coherence across sectors and regions, and in a way that allows for patients to be more involved in their own treatment and care than has been possible until now. Telemedicine treatment and care can be divided into three levels:

- Interaction with the patients. Telemedicine strengthens involvement of the patients. This is to be understood as both patient empowerment (access to personal medical data, increased influence on the treatment) and as an increased degree of self-service (more participation in the

http://www.regionsyddanmark.dk/wm228953
treatment and care, e.g. by means of self-check-up and self-medication, and by delivery of anamnesis data via the Internet prior to consultations, ambulant treatment, and hospitalisations)

- Cross sector co-operation. This concerns e.g. areas such as shared care for patients with diabetes based on shared data and video conference (by means of webcams) between general practitioners and dermatologists or other specialists

- Support of geographically dispersed hospital units. This support can create coherence internally in hospitals (for instance, geographically dispersed units can use video conference), between hospitals in the region (sharing of data and conferences in connection with transfer of patients), and across regional borders (the same situation as within the region, but where the patient is transferred to a hospital in another region).

The Region of Southern Denmark has already initiated a number of ventures within telemedicine, and these ventures will be expanded during the strategy period. In order to support testing and dissemination of telemedicine IT support and telemedicine work methods, the Region of Southern Denmark will co-operate with the municipalities to establish a regional centre for telemedicine. This will be done in close co-operation with organisations and companies with relevant experience, including MedCom, whose standards and guidelines are to comprise a significant part of the foundation for the initiative. It would be beneficial to also include the University of Southern Denmark and other relevant innovative environments. The centre for telemedicine will play a central role in the development and implementation in relation to other focus areas, e.g. interaction with patients and cross-disciplinary integration. A number of somewhat detailed descriptions of projects already exist and these will make it possible to test telemedicine IT support and telemedicine work methods. This concerns e.g. application of tele-measuring equipment for remote monitoring of patients with poor circulation, anticoagulant treatment at home with active participation of the patient, and support of wound care in the home care system.

The many telemedicine solutions ready for operation are to be expanded in order for the entire health care system in the region to benefit from them. Thus, an action plan for this expansion has to be composed. During the period in which this strategy is in action, the Region of Southern Denmark will prioritise the following areas:

- Establishment of a centre for telemedicine
• Increased effort to implement well-functioning telemedicine solutions

• Development of new applications.

**A Strategy to Strengthen the Efforts against Chronic Diseases**\(^{10}\): The Region of Southern Denmark has prepared a strategy that strengthens the efforts against chronic diseases, the so-called “kronikerstrategi”. The strategy must be the common focal point for municipalities, the region, and general practices in the efforts supporting the chronically ill in the South Danish Region.

The initiatives demand a great extent of coordination and are expected to run over a number of years. Complete implementation demands a comprehensive organisation of the practice sector, the hospital sector, and parts of the health services located at the local authority. The implementation must happen concurrently with the creation of resources and consensus. Coordination groups must create standardized regional guidelines for each initiative.

**ICPC-coding (diagnose coding) and ICT-support**: Concerning ICPC-coding (diagnose coding) and ICT-support, the strategy is described as follows: “The Region of Southern Denmark supports an increased use of ICPC-coding in general practices through specific quality-development-projects and participation in the ICPS-group of ‘Den Almenmedicinske Kvalitetshed’ (The General Medicine Quality Unit) DAK-E.\(^ {11}\)”

An optimal treatment of people with chronic diseases demands classification and overview. Focus must hence be brought to ICT-support of the patient related work.

Today, practically 100% of the general practitioners use electronic health records (EHR). The use of EHR, however, has not been optimal as several systems have trouble providing an overview of the data. ICPC-coding of every application in practice could be used for

• a better overview of the continuity of care,

• analysis of data for the purpose of internal quality development in practice,

• Exchange of data between systems across sectors (quality monitoring of diseases).

**Telemedicine solutions and equipment for self-monitoring**: The strategy also addresses

\(^{10}\) [www.regionsyddanmark.dk/wm331609](http://www.regionsyddanmark.dk/wm331609)

telemedicine solutions and equipment for self-monitoring: “Hospitals, municipalities, and general practices are developing, implementing, and disseminating telemedicine initiatives. For each diagnosis group a plan for introduction and dissemination is developed as a part of the implementation of clinical pathways”.

In some cases, telemedicine can facilitate the possibility for the citizens to receive treatment in their own homes and e.g. make measurements on their own. This way, the citizens are receiving treatment, but do not have to spend time travelling back and forth to the hospital just as the municipalities and the region save money on transportation.

The supervision and the follow-up of ambulant care by the use of telemedicine must support the care of patients in the primary sector to the extent possible considering the need for specialist involvement. I.e. the general practitioner continues to be the patient’s treatment provider.

The use of telemedicine in the region is characterized by pilot projects and isolated initiatives for defined diseases and target groups. Furthermore, projects involving telemedicine technologies for the support of treatment of patients suffering from a chronic disease in their own home is part of the common eHealth strategy of the region. The projects involve telemedicine treatment of patients suffering from COPD, telemedicine wound care, and the use of video conference for the discharge conference or conference between therapists in municipalities and at hospitals.

A systematic dissemination of telemedicine solutions for the entire region as well as the initiation of new arrangements demands a clear definition of target groups. This will differ from disease to disease and must be determined in the future implementation of the strategy. In correlation with the principles of stratification, self-treatment is most relevant for patients with simple disease and good self-care, but on the other hand it might not be possible for the most complex and vulnerable patients. In addition, this calls for massive investments in treatment equipment in the hospitals as well as education/instruction, control, and follow-up of the patients in self-monitoring and self-treatment programmes.

This latter point could include drawing on home care and home nurses. In relation to resources, the implementation of telemedicine will result in considerable expenses – especially for the hospitals in terms of the purchase of new equipment – but also for the municipalities in terms of the additional involvement of the home care system for the assistance of home treatment, etc. as well as an increased involvement of primary care in terms of checkups and follow-up. However, the

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12 ibidem
implementation will also result in immediate financial benefits. One reason for this is the lower number of patients needing ambulant treatment as they will be able to treat and check up on themselves in their own homes. In the longer run, the investments are expected to result in compensating savings in the form of shorter and fewer hospitalisations as well as reduced expenses for transportation, so the strategy.

The time frame for telemedicine initiatives depends on whether it is a matter of initiating multiple projects or implementing initiatives in daily operation. It is estimated that the latter can be initiated within a period of six months to a year, while the latter would probably take a number of years depending on the scope, integration with patient record systems, etc.

1.4 The Role of ICT in Prevention and Treatment in Denmark

The role of ICT in health care plays a great role in the entire country and this chapter applies to the Region of Southern Denmark as well as the North Denmark Region.

In February 2010, the regions in Denmark established “Regionernes Sundheds-IT” (RSI; eHealth Organization of the Danish Regions), with a steering committee composed of management and ICT-executives from the five regions as well as the board of directors of the Danish Regions, in order to strengthen co-operation within and between the regions in relation to eHealth in the Danish hospital and the health care system. In the Position Paper on Health ICT\textsuperscript{13}, six Danish ICT research challenges were identified:

- the clinical ICT workplace
- optimal operation of hospitals
- patient empowerment
- coherence and cooperation
- prevention and health promotion
- individualised treatment for chronic diseases.

\textsuperscript{13} Position Paper on Health ICT 2011, \url{http://itek.dk/EU/Documents/DICTAT_ICT_for_Health.pdf}
Patient empowerment: The health care system must facilitate citizens’ abilities to attend to their own health. This can be done by making information and services accessible and by providing good possibilities for self-care. Concrete examples could be online reservation and alteration of scheduled check-ups and treatments, safe electronic communication with the health services, and access for chronically ill patients to the latest telemedicine solutions, so they can be monitored in their own home and be involved in the care for own health.

RSI has drawn up six direction points for patient empowerment:

- The regions now make the electronic patient record available to the citizens. The health record will also be made available when completed.
- All regions will send relevant mail to patients’ digital mailbox by the end of 2012.
- All regions will send text messages to patients prior to scheduled hospital appointments by the end of 2012.
- The regions will carry out a large scale project concerning ICT support of a selected group of chronically ill patients by the end of 2011.
- In a Patient Handbook on the web site sundhed.dk (TR: health.dk), the regions will provide access to 2500 evidence based articles about health, disease, and treatment for citizens and patients.
- During the spring of 2011, the five regions will compose a common strategy for ICT support of patient empowerment with a focus on common efforts.

However, the realisation of these direction points for the eHealth effort cannot stand alone. It is especially crucial for the state – when they provide solutions for incident reports and clinical data for health care staff – that they do it in a uniform way, which can be adapted to the clinical work routines and offer a suitable level of support. It is also important that the institutions and authorities of the state enter into an obligation to support the quality, activity, and economy control of the regions. Similarly, the state must ensure that there are no legal barriers to fulfilling the common regional direction points.
1.4.1 The Role of ICT in Prevention and Treatment in North Denmark

ICT coordination at the regional level: In the Region North Denmark, there are several governing bodies with regard to ICT. In charge of the overall ICT strategy is the Extended Executive Board of directors. The regional bodies take advice from:

1. The ICT coordination committee
2. The steering committee for the clinical ICT workplace
3. The clinical ICT reference group

The ICT coordination committee: The purpose of the ICT coordination committee is to create a foundation for joint decision making regarding ICT strategies, policies, and initiatives. Thus, the role of this committee is to ensure that decisions made in the various areas of the ICT-initiatives are consistent with the general interests of the region as a whole.

In other words, the overall task of this committee is to recommend projects to the Extended Executive Board (one of the leading bodies in the region), which means they are responsible for evaluating whether new project ideas have strategic relevance, as well as testing the ICT initiatives, before they are presented to the Extended Executive Board. The committee can make decisions within the scope defined by the Extended Executive Board.

Members of the ICT coordination committee are:

- the head of the ICT department (Chairman)
- one representative from each of the five hospital management groups
- two representatives from the group of department heads
- one representative from the management of the department for regional development
- one representative from the management of the primary sector
- one representative from the management of health-planning and the quality department
The steering committee for the clinical ICT workplace: The steering committee has the responsibility of a project (from start to implementation of the product), and they refer to the Extended Executive Board. Among other things they must ensure a united and coordinated management of the clinical ICT workplace at the hospitals as well as making sure that the clinical ICT workplace is implemented homogenously in the entire Region North Denmark. Furthermore the committee is responsible for making the necessary prioritisations between the various projects – e.g. with regard to resources.

Members of the steering committee for the clinical ICT workplace are:

- the head of the ICT department (Chairman)
- one representative from each of the five hospital management groups
- the chairman of clinical ICT reference group
- one representative from the management of Health - Planning and Quality Dept.
- the head of ICT Project and Strategy office
- the head of IT Use and Development office.

Clinical ICT Reference group: The purpose of Clinical ICT Reference group is purely advisory. They contribute with clinical guidance regarding ICT related matters and they advise the Clinical Forum, the ICT coordination committee, and the steering committee for the clinical ICT workplace.

This means that the Clinical ICT Reference group must contribute with clinical knowledge to continuously quality assure the entire project portfolio. This will ensure the clinical value of the projects and in continuation of this that the clinical workplace will function in an optimal way.

Clinical Forum: In general, the Clinical Forum contributes to ensure that no matter where a patient is treated in the North Denmark Region, she or he will receive health benefits with the same high quality and patient security.
Thus its task is to give strategic health professional advice to the North Denmark Region Executive Board and Extended Executive Board. In addition, they function as sparring partners for the administration in connection to national plans and strategies.

1.4.2 The Role of ICT in Prevention and Treatment in the Region of Southern Denmark

ICT plays a great role in the prevention and treatment of chronic diseases in the Region of Southern Denmark. For examples on actual cases where ICT is used, please refer to the report “Examples of Good Practice Use of ICT in Healthcare and its Potential Transferability”.

**Involvement of and interaction with patients suffering from chronic diseases:**  Patient empowerment (involving the patient as much as possible in the treatment and control of their own disease) and self-service will be significant focus areas for the Region of Southern Denmark. It should be possible for patients to:

- enter personal information via a designated channel on the Internet, which will transfer the information to relevant systems in hospitals and at general practitioners prior to consultations, hospitalisations, ambulant treatment, etc.

- take over all or some of the monitoring of their own condition and possibly any necessary readjustment of medication or other treatment according to their abilities to do so

- gain access to own data to a larger extent than is the case today

- use IT for communicating with health care staff even when in the hospital, for gaining knowledge about hospital structure and functions, diet plans and menus, for controlling the immediate environment around the hospital bed (light, ventilation, radio/TV, etc.), for communicating with the outside world (e.g. relatives), etc.

These solutions for the patients are to be developed in co-operation with patients and patients associations. In the coming years, the region will focus on IT support of the interaction with patients suffering from chronic diseases. The region’s strategy for chronically ill patients focuses on effective IT support of the interaction with these patients. Large groups of socioeconomically advantaged patients will be motivated to monitor themselves and treat themselves, which will contribute to lessening the strain on the health care system and at the same time increase the
patients’ quality of life.

The telemedicine support constitutes a significant part of this effort. It offers to chronically ill patients the opportunity of contact with treatment providers whenever relevant and not just in connection with scheduled check-ups. Thus, readjustment of medication and other parts of the treatment become more flexible and the course of treatment is improved. Furthermore, this can eliminate a number of face-to-face consultations and hospitalisations. Still, this telemedicine support should be supplemented with better patient education and increased access to personal data for patients. In this connection, IT support has great relevance, e.g. in the form of e-learning systems and internet access to patient records.

During the period in which this strategy is in action, the Region of Southern Denmark will prioritise the following areas:

- increased focus on patient empowerment through IT support of patients’ influence on and participation in their own treatment and care,

- involvement of patients suffering from chronic diseases in their own treatment, supported by digital communication and control in the home.
2 Finland

2.1 Finland and the Region of South Ostrobothnia – Background and Statistics

Finland consists of approx. 5.3 million inhabitants and the average population density is 17 inhabitants per square kilometre. This makes it the third most sparsely populated country in Europe, after Iceland and Norway. The population distribution is very unbalanced: the population is concentrated on the small south-western coastal plain. About 64% of all inhabitants live in towns and cities, with one million living in the Greater Helsinki Area alone. In Arctic Lapland, on the other hand, there are only 2 people to every square kilometre.

Southern Ostrobothnia is one of the 20 regions in Finland. Seinäjoki is the regional centre and the largest city in the area.

2.2 Health Care Organisation in Finland and the Region of Ostrobothnia

In Finland, primary health care is organized by the municipalities. Generally, municipalities organise the primary health care in co-operation with their neighbouring municipalities. The organising-form for co-operation is joint municipal authority.

For the organisation of specialised medical care, Finland is divided into 20 hospital districts. Five of them are university hospital districts. The Hospital District of Helsinki and Uusimaa is the largest of these\(^\text{14}\). One hospital district can run several hospitals.

The specialised health care in South Ostrobothnia is organized by the South Ostrobothnian hospital district which is a joint municipal authority set up by all of the municipalities in the region.

**Primary care and social care**: Social services and health care in Finland are supplied largely as a single entity and are provided by local authorities. The administrations of social welfare and primary health care have been combined, and the services are closely co-ordinated in accordance with the principle of overall regional responsibility for the population.

\(^{14}\) [http://www.hus.fi/default.asp?path=59,404,4024](http://www.hus.fi/default.asp?path=59,404,4024)
Local authorities in the South Ostrobothnia region run 24 health centres for the population of 194,000; 23 of these are run by six joint municipal authorities. Preventive health care is very important in Finland. The services of prenatal clinics and child health clinics, for instance, are available free of charge to all families. Environmental health care is regarded as part of basic health care. Alongside municipal health care, an occupational health service system exists and is financed by employers and the State. There is also a relatively extensive system of private medical services, partly financed by the health insurance system.

The organisations for providing primary health care services in the sub-regions of South-Ostrobothnia are; Suupohja Joint Municipal Enterprise for Basic Services, JIK-Joint Municipal Enterprise for Basic Services, Joint Health Care Authority of Kurikka, Seinäjoki Health Care Centre, Lapua Health Care Center, Joint Municipal Board of Kaksineuvoinen, and Järvi-Pohjanmaa cooperation area. The responsibility areas of these organisations are seen on the map in figure 1.

Figure 1: Map of health care organisations in South Ostrobothnia

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15 Map: Association on Finnish Local and Regional Authorities, South Ostrobothnian healthcare units: addes by South Ostrobothnian Health Care District
Special care: Every municipality is required by law to be a member of a joint municipal authority administering a hospital district. The South Ostrobothnian region has two somatic and one psychiatric hospital. Hospitals run by joint municipal authorities provide 95% of all specialist medical care; the remaining 5% are provided by the private sector. As part of health care, hospitals are forming networks and the cohesion of the entire health-care sector is being improved. Fees are charged for visits to health centres and for hospital stays. The public health services have a very low fee for the customers. The government social insurance agency (Kansaneläkelaitos or KELA) provides financial assistance to residents when paying for healthcare (also private healthcare). Reimbursement of medical expenses is available for doctor's fees, dental care costs, examination, treatment charges, and more.

Local authorities are responsible for providing care for the elderly. Their main statutory functions include home care services, various support services, informal care allowance, housing services, and institutional care. Some of these services are provided by organisations subsidised from public funds.

2.3 The Role of ICT in Prevention and Treatment of Chronic Diseases in Finland and the Region of South Ostrobothnia

In Finland, there is a national eHealth strategy. Nationwide electronic patient records (EHRs) will be introduced and implemented in all organisations.

In December 2006, the Parliament decided to introduce a national EHR archive in order to enable access and exchange of patient information across healthcare service provider organisations at the point of care, based on patient consent. KanTa (Finnish National Archive of Health Information) is a collective term used for a range of national health care information systems including a national health record archive, a national electronic prescription systems, a national pharmaceutical database, and a portal for citizens to access their own health information online. Implementation has been delayed up to 2013.

National Level\(^\text{16}\)

The Finnish Ministry of Social Affairs and Health Report states that the European Union’s eHealth Action Plan (COM 2004(356)) demanded the member states to introduce their national eHealth

\(^{16}\) http://pre20090115.stm.fi/pr1172737292558/passthru.pdf
roadmaps by the end of 2006. In the Finnish case all of the major policy achievements and the national development actions from the last ten years were taken into the roadmap. Simultaneously, the future challenges and the EU level co-operation objectives were written down. (Ministry of Social Affairs and Health, Reports 2007:15)

According to the report there were two major objectives for the Finnish eHealth development. Securing the access to the information to the patients involved in care, regardless of time and place, is the first one. In order to obtain this goal all patient data must be available in digital form, including the electronic patient record system with regards to the entire content of a record. Setting up a national health care infrastructure with electronic signature, information network solutions and providing the information for supporting decision-making on the internet are part of the process.

The second major objective is to improve the involvement of patients and citizens. This is primarily done by improving the access to information and providing high quality health information online. The Finnish Ministry of Social Affairs and Health claim that the measures have included developing the information portal on health issues online, as well as providing the citizens an access to their patient records, and enhancing the interactive electronic services. According to the Ministry for Social Affairs and Health the objectives are very similar to the objectives of the EU Commission as well as most of the other EU member states. However, the Finnish approach emphasizes the protection of the patient records and the data security. Also ethical and juridical issues are prioritized.

In the Report of the Ministry for Social and Health affairs the Finnish Coordination Group sees that the demand for European cooperation is increasing. The Ministry sees itself as a responsible actor for international preparation at the political and strategic level. Other organizations such as Social Insurance Institution, National Authority for Medicolegal Affairs, National Research and Development Centre for Welfare, and Health STEKES can be involved in accordance with their national areas of responsibility.

**Kaste programme:** In 2007, the national development program of the social- and health care sector “Kaste” was initiated by the Finnish Ministry of Social Affairs and Health to produce easily accessible semantically interoperable patient records and a national concept for archiving health information. It is implemented by the Social Insurance Institution of Finland.

The main objectives of the Kaste programme are based on the long-term strategic objectives of the administrative sector. The aim is that the citizens of the municipality’s involvement will increase and their social exclusion will be reduced, the health and well-being of the citizens will increase,
inequalities in wellbeing and health diminish, and the quality, effectiveness and availability of services for the municipal inhabitants will improve and regional inequalities will be reduced.

In the Kaste programme there is a separate chapter concerning eHealth. According to the programme, eHealth can support the independent preventive health care of the individuals. Health can also decrease the overlapping work of the health care administration and simultaneously improve the process administration. The programme aims at creating a national electronic patient register and electronic medicine prescriptions. According to the objectives of the programme, citizen based eHealth services are created by numerous municipal projects which are nationally co-ordinated by the ministry.

**Regional level:** South Ostrobothnia does not have a regional eHealth strategy. However, the national eHealth strategy and nationwide EHR will be introduced and utilized in all organisations in South Ostrobothnia. The South Ostrobothnia hospital authority is co-ordinating the development of an EHR together with ten other hospital regions.

There are also several eHealth projects implemented at the moment. A region wide computerised information system in health care is implemented, which includes medical histories and systems for patient administration and referrals (e-referral, e-discharge, telemedicine, Picture Archiving and Communication System (PACS), e-laboratory results).

South Ostrobothian primary health care providers are implementing Lakeuden Potku – a project that is part of the larger national Potku project. The aim of the project is to renew the treatment of chronic diseases. The model is based on the Chronic Care model created by Edward D. Wagner. ICT as well as prevention by the use of ICT is part of the model and also part of the project.

The use of the model in Finland is one of the key objectives of making health care more effective. Taking up two thirds of the health care costs, chronic diseases are an increasing problem among the ageing population and for the health care system. Preventing and more efficiently treating chronic diseases are the key ideas of the model, since it’s possible that the health care system as it looks now can’t cope with the increasing demand of the services.

In South Ostrobothnia a patient record based decision-making program is being piloted. The program is linking the records of a single patient to researched data, and based on these data the program can provide treatment advice. Also reminders of the treatment, treatment results, compatibilities, and risks are provided to health care professionals for supporting the treatment and prevention. By the use of the programme it is possible to sample patient population and to make
virtual health care check-ups. This will reveal the risk groups which can be given preventive treatment.

ICT tools used in South Ostrobothnia are:

- Information portal for general and disease specific information for the population in order to empower the patient/population regarding prevention and treatment e.g. National Health Library portal (free of charge),

- Information and decision making tool for professionals e.g. EBM (Evidence Based Medicine) guidelines and nationally approved treatment protocols (annual fee),

- Internet-nurse in Health centres for patient contacts (enquiries, questions, test-results, follow-up, appointments) (free of charge),

- Health Centre and Hospital information portal (free of charge).
3 Germany

3.1 Germany - Background and Statistics

The Federal Republic of Germany is a federal parliamentary representative democratic republic. It consists of sixteen Federal states, thirteen area states and three city-states. The states have between 663,000 and 18 million inhabitants, resulting in a total population number of approx. 82 million in Germany. With a total area of 357,000 square kilometres, the population density of the Federal State varies between 74 inhabitants per square kilometre in Mecklenburg Western-Pomerania and 3,807 in Berlin. So the mean population density in Germany is 229.1 inhabitants per square kilometre\(^{17}\).

Schleswig-Holstein is the northernmost Federal State of Germany and lies between the North Sea and the Baltic Sea. It has an area of approximately 16,000 square kilometres and 2.8 million inhabitants and thus a population density of 179.8 inhabitants per square kilometres\(^{18}\).

3.2 Health Care Organisation in Germany

The German health care system has its roots in the introduction of the statutory health insurance on the Federal State level in 1883. The current health care system has a decentralized structure. The decision-making powers are shared between the Federal States, the federal government, and legitimized civil society organisations. The government delegates health care competencies to membership-based, self-regulated organisations of payers and providers: The statutory health insurance is the most prominent scheme for health care; health insurance companies (HICs), their associations, and associations of statutory health insurance (SHI)-affiliated physicians have taken on the status of quasi-public corporations. Hospitals are not represented by public corporations but by organisations under private law.

The federal ministry of health (Bundesgesundheitsministerium\(^{19}\)) is the core actor in defining and setting the framework conditions of the national health policy. The ministry develops the laws concerning health which, if they are approved by the parliament, define the frame of the social insurance system. On this level there are also Ministries of Health, often combined with responsibilities for social affairs or other policy fields. The federal ministry of health supervises the

\(^{17}\) Statistische Ämter des Bundes und der Länder: Bevölkerung am Monatsende http://statistik-portal.de
\(^{18}\) ibidem
corporatist bodies. Execution rests with the so-called self-administration bodies of medical doctors, dentists, insurances, hospitals, pharmacies and others, who assist the federal ministry of health with respect to the execution of licensing and supervisory functions, scientific consultancy work and information services to the population or scientific community. In the event that they cannot agree on details by a set date, the Federal Ministry may set a final date and specify itself the execution details ("Ersatzvornahme") 20.

Funding: The health care system is characterized by pluralistic funding systems. In July 2011, there were 154 statutory HICs and 46 private HICs. They may define and raise membership fees and finance or deliver services to their members. In 2009, a uniform contribution rate for all statutory HICs was set by the government and, although statutory HICs continue to collect contributions, all contributions are centrally pooled by a new national health fund, which will allocate resources to each statutory HIC based on an improved risk-adjusted capitation formula. Statutory health insurance is the major source of financing of health care, covering approximately 87% of the population in 2006. Depending on their income this insurance was compulsory for the main part of insured persons (earning less than approx. €48,000 per year, including dependents) or voluntary (for those with a higher income). 13% of the residents had a private health insurance 21, which is accessible for high-income citizens, civil servants and self-employed persons and is – in contrast to a statutory health insurance – under private law and may have a profit motivation. Another 0.2% of the population had no prepaid coverage for health care. Since 2009, health insurance is mandatory, depending on previous insurance and/or job status either in the statutory or in the private health insurance scheme. 22

Coverage: The statutory health insurance benefits package covers preventive services, inpatient and outpatient hospital care, physician services, mental health care, dental care, prescription drugs, medical aids, rehabilitation, and sick leave compensation. Since 1995, long-term care is covered by a separate insurance scheme which is mandatory for the entire population. Until recently, self-paying patients were not common (except for pharmaceuticals and dental care). However, since 2004 self-paying patients are charged for visits by adults to physicians and

19 Until 2005 Federal Ministry of Health and Social Security, Bundesministerium für Gesundheit und Soziale Sicherung, BMGS.
22 The chapter Insurance systems based on Busse R. (2008), Description of Health Care Systems. The German Health Care System
dentists. There are also some self-paying patients for outpatient medications, for inpatient days, for prescribed medical aids and for dental prostheses. The total of self-paying patients added up to 13.8% of the total health expenditure in 2005.

The private HICs provide their members with some additional medical services, for example dental prosthesis or psychotherapy.

**Delivery system:** General practitioners have no formal gatekeeper function. However, in 2004 HICs were required to offer their members the option to enrol in a “family physician care model” which includes a bonus for complying with gatekeeping rules. Ambulatory care in all specialties is mainly delivered by physicians working in single practices, although polyclinic-type ambulatory care centres with employed physicians have been allowed since 2004. Physicians in the outpatient sector are paid through a mixture of fees per time period and per medical procedure.

Hospitals are mainly non-profit, both public (approximately half of all beds) and charitable (approximately one-third of all beds)\(^23\). The private for-profit segment has been growing over the last years (approximately one-sixth of all beds), mainly through takeovers of public hospitals. Independent of ownership, hospitals in principal are staffed by salaried doctors. Senior doctors may also treat privately-insured patients on a fee-for-service basis. Doctors in hospitals are typically not allowed to treat outpatient. Exceptions have been made if necessary care cannot be provided by specialists in private practices on an outpatient basis. Since 2004, hospitals may also provide certain highly specialized services on an outpatient basis. Inpatient care is paid through a system of Diagnosis-Related-Groups (DRG) per admission.

Individuals can choose freely among ambulatory care physicians and in case of inpatient care, among hospitals.

**Disease Management Programs (DMPs):** In 2002, legislation established Disease Management Programs (DMPs) for chronic illnesses in order to give the HICs an incentive to care for chronically ill patients. DMPs currently exist for diabetes types 1 and 2, breast cancer, coronary heart disease, asthma and chronic obstructive lung disease (COPD). DMP participants are accounted separately in the risk-adjusted reallocation mechanism between HICs, i.e. they generally receive higher allocations than non-DMP participants. Through that mechanism, HICs with higher shares of DMP patients receive higher compensation. There are currently 14,000 regional DMPs with 3.8 million enrolled patients (as of late 2007).

3.3 The Role of ICT in Prevention and Treatment of Chronic Diseases in Germany

The Law for the Modernisation of Statutory Health Insurance of November 2003 is the basis for the endeavour to reform the German health care system. This law (Social Code V, §§ 290-291) provides for

- a new lifelong patient identifier which identifies the citizen, independent of where he/she is insured, for purposes of the healthcare system, while all data protection requirements are met,

- the introduction of an Electronic Health Card (“Gesundheitskarte”) and

- the establishment of institutions deemed necessary for a successful implementation.

The eHealth strategy is derived from the overall strategy towards an Information Society as described in the European Union Lisbon Strategy. In 2005, the Federal Ministry of Health and Social Security summarised its overall position concerning strategic eHealth developments in a paper entitled “The German eHealth Strategy”. The paper formulates the policy intentions and perspectives of the above mentioned legal provisions implicit in Germany's eHealth strategy in a non-judicial way. The target of the strategy is described as follows: “The healthcare system in Germany is a system with a pressing demand for intensive communication between the different actors with the aim of achieving better collaboration and thus numerous positive results for the health of the citizens, the healthcare system and the State’s economic situation.” The overall target of the German eHealth strategy is the modernisation of the healthcare system using information and communications technology, with the following objectives: establishing more citizen-oriented services, supporting patient-centred care, improving quality and services, reducing costs, and providing better data for health system management.

Strategy: The strategy for achieving the modernisation targets consists of two steps. The first step is to establish an ICT infrastructure financed by one or a few applications, so that other applications can build on this infrastructure without having to carry those basic costs. The following priority applications are mentioned to have a positive cost-benefit ratio:

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24 The German eHealth Strategy, Bundesministerium für Gesundheit und Soziale Sicherung, S. 1 Berlin/Bonn 2005
online verification of insurance status (mandatory for all citizens insured in the public system),

transmission of (drug) prescriptions (mandatory for citizens),

drug interaction and contraindication checks (voluntary like some of the other envisaged applications).

The second step is the implementation of applications of a private electronic patient record and successive other applications, using the established infrastructure.

The basic underlying concept of the German eHealth strategy is the “citizen-managed, personal electronic health record”. This personal electronic health record is offered and operated by the healthcare system and is defined by law and by contracts entered into by the self-administered healthcare system at the federal level. The data is usually provided and used by healthcare professionals in the form of electronic copies of the original documentation. For access to the personal electronic health record, a specific smart card is used as the citizen’s tool to access and manage data in a trustworthy and secure way. This card will not be used for non-health related purposes.

Applications: The law defines mandatory and voluntary applications and data that can be managed using the Electronic Health Card (EHC) as an access tool. The mandatory applications are introduced in the first step; the voluntary applications will become available later. The mandatory applications are

- provision of administrative data (data identifying the citizen and his/her insurance status),
- provision of information about share of private user payment,
- transmission of electronic prescriptions,
- provision of data supporting European regulations for the exertion of rights for medical treatment in the Member States of the EU (in Germany the data is not only visible but also stored on the chip, thereby creating an ‘Electronic European Health Insurance Card’).

Voluntary applications\textsuperscript{25}, that should be available if the citizen gives informed consent, are

\textsuperscript{25} gematik
• data for emergency care,

• discharge letter (*elektronischer Arztbrief*),

• information on individual drug intolerances, drug interaction and contraindication checks,

• electronic health record (*elektronische Patientenakte*),

• additional data about the insured person provided by himself/herself or others (*Elektronisches Patientenfach*)

• data on received medical services and user payment (*elektronische Patientenquittung*).

**History and roadmap:** The Society for Health Telematics, gematik (*Gesellschaft für Telematik*), established in January 2005, was provided to plan, implement, and manage the necessary eHealth infrastructure services. Gematik conducts tests to ensure that applications, components and services are functional, practicable and stable. First, tests in a central test laboratory and then practical user tests with test data are conducted. They are followed by field tests in test regions with real data with 10,000 users and then with 100,000 users. In the field tests 60,000 insured persons, 180 physicians, 115 pharmacists and 11 hospitals are involved.

Until July 2009, the reading of administrative data, the creation of data sets for emergency care and the saving of electronic prescriptions on the electronic health card were tested and evaluated. The next step is the testing of the online-update of administrative data, the direct communication between physicians, the electronic discharge letter and the emergency data set in the test regions.

The introduction of the EHC was initiated in October 2009, for the time being only in the region Nordrhein in the federal state Nordrhein-Westfalen. A successive expansion to further regions, called "the basis roll-out", is intended. Gematik has already given the necessary approval of the card terminals/connectors that are needed for the use of the EHC. According to the National Association of Statutory Health Insurance Physicians (*Kassenärztliche Bundesvereinigung*) and the German Hospital Association (*Deutsche Krankenhausgesellschaft*) it is possible to supply all medical practices with connectors in 2011. The federal ministry of health states that the statutory HICs are bound to provide 10% of their members with an EHC until the end of 2011. Otherwise their administrative expenses will be shortened.

26 [http://winfuture.de/news_50226.html](http://winfuture.de/news_50226.html)
The private medical insurance association opted out of the basis roll-out in 2009 because of the investment risk\(^{27}\).

The government decided in 2009 to develop a comprehensive strategy on the digital future in Germany under the coordination of the Federal Ministry of Economics and Technology. The strategy „Deutschland Digital 2015“ has a political-economic orientation and was finalised in November 2010. A short section of the paper is also concerned with eHealth. The overall aim is to enable the nationwide provision and use of telemedical and tele-monitoring applications and the use of ICT in the care of elderly citizens. Two schemes are supported to achieve this goal: first, the development of a package of measures, the eHealth implementation strategy, in 2011, and the start of its implementation in 2012; second, the implementation of a series of projects on future-oriented living facilities for persons in need of care („Das intelligente Heim – Ablaufoptimierung, kurze Wege, Entbürokratisierung“).

ICT in health and medical informatics receive increasing attention. At the moment the political efforts with respect to eHealth focus on establishing an ICT infrastructure and introducing the EHC, which is perceived as a basis for further applications. Although the implementation often was delayed because of problems and broad discussions concerning the data security, the informational self-determination\(^{28}\), the financing and technical problems, this approach is pursued by the government as a necessary and fundamental step towards a modern health care system.

Research on ICT applications in the prevention and treatment of chronic diseases is increasing. Currently, there is no political strategy to support these actions, with the exception of the implementation of future-oriented living facilities for persons in need of care; however, an eHealth implementation strategy, which will provide a package of measures, is to be expected in 2012.

The strategy paper „Deutschland Digital 2015“ presents a comprehensive view on ICT, with health care - and old or chronically ill persons in particular - as one target domain. Here the link between demography and eHealth is drawn: The strategy paper envisions eHealth applications in the area of telemedicine and tele-monitoring as a great tool for the improved care of patients with chronic diseases in their homes. The use of eHealth applications might resolve the spatial distance between patients and their treating physicians. According to the paper, the eHealth infrastructure


\(^{28}\)The term informational self-determination means “the right of the individual to decide what information about himself should be communicated to others and under what circumstances” (Westin, A., Privacy and Freedom, New York: Atheneum, 1970).
has the potential to maintain and maybe even increase the attractiveness of their living environments to aging citizens. New solutions for supporting and caring for elderly people are to be supported.

A progress in ICT implementations depends on similar aims and a good collaboration of all involved organisations and persons. Therefore the government, in cooperation with the executing bodies of the health care system and the service providing organisations, strives to identify possible barriers in the implementation and to smooth the path for a faster transfer of applications from the model phase to the regular health care provision.

In the end of 2011 the German Government passed a law regarding the medical undersupply especially in the ruraly regions, where an all-embracing medical supply through family doctors is not more warranted. The so called Versorgungsstrukturgesetz gives appeals for medicine professionals working in those country areas. Besides financial and organisational appeals, ICT has a fundamental potential (tele-consultation, tele-mentoring etc.) to play an important role in counteracting brain drain and professional isolation of health professionals. The EU-Project PrimeCare IT will raise the attractiveness of remote primary health care for medical professionals by the means of the use of ICT.

29 http://www.ehealthforregions.net/news/11_10_05_PrimCare_IT_approved.php
30 ibidem
4 Lithuania

4.1 Lithuania - Background and Statistics

Lithuania has a two-tier administrative division: the country is divided into 60 municipalities which consist of over 500 elderships.

Municipalities are the most important administrative unit. Each municipality has its own elected council. The election of municipality councils takes place every four years. The council elects the mayor and appoints elders to govern the elderships. There is currently a proposal for direct election of mayors and elders; however that would require an amendment to the constitution.

Lithuania covers an area of 65,000 square kilometres. The number of inhabitant’s amounts to 3.2 mio, and the population density is approximately 50 inhabitants per square kilometre.

4.2 Health Care Organisation in Lithuania

In 2009, there were 148 state, county, or municipality hospitals and 430 outpatient health care institutions functioning in Lithuania. There were nearly 2,500 private health care establishments in 2009, but only or 65% of them presented annual reports on their activities and resources. In 2009 there were 68.3 hospital beds (excl. nursing beds) per 10,000 inhabitants in Lithuania.

At the end of 2009, there were approximately 13,000 physicians (39.7 per 10,000 inhabitants) and 2,400 dentists (7.2 per 10,000 inhabitants) working in Lithuania. 26.6% of all physicians and 80.3% of dentists works in private health care institutions.

The Ministry of Health is the leading institution responsible for forming and implementing health policy, ensuring public health, high quality of health activity, and rational use of resources. It is responsible for the development of the health care system in order to ensure accessibility to and maximum quality of health services. The strategic objectives of the Ministry of Health encompass31:

- fostering responsibility of each person for his or her own health

31 Strategic Goals of the Ministry of Health, www.sam.lt
• creating equal conditions for all citizens of the country to receive the necessary health care services

• provision of an accessible and qualitative health care by improving the performance of personal health care institutions and by ensuring staff qualification and administrative competence upgrading

• implementation of prevention programmes of chronic diseases

• reduction of communicable diseases by implementing the computerized system of notification about communicable diseases which will be connected to the EU Network of Communicable Diseases

• control of pharmaceutics market to assure that only qualitative, safe, efficacious and inexpensive drugs meeting EU requirements prevail in the Lithuanian market

• refining observation of public health development by development of public health monitoring in local offices

• control and effective use of the funds allocated to the personal health care institutions

• promoting the implementation of modern technology.

In 1996, the Health Insurance Law was approved, which provided for the introduction of a compulsory health insurance for all permanent residents of Lithuania. The Compulsory Health Insurance Fund is the main source of health care financing. Compulsory Health Insurance is executed by the Compulsory Health Insurance Council, the State Patient Fund, and five territorial patient fund offices, which provide services to all ten counties of Lithuania. Those who are not insured may apply only for necessary medical aid. Such persons should pay for other services on the basis of the prices set by the Ministry of Health.

Health Care Delivery (primary care, Social Care, Special Care)

Health care services are mainly provided by public institutions. The increase of the private sector, especially in the field of primary health care and odontological care, has slowed down. Public health care service providers are subordinate to the Ministry of Health.
Primary health care specialists are responsible not only for direct patient-related activities like consultation, diagnosis and treatment of elementary health issues, but should also target disease prevention functions. If specialised assistance is necessary, the GENERAL PRACTITIONER acts as a counsellor and coordinator, guiding through the health care system, monitoring the occurrence of chronic diseases and making the referrals to relevant specialised consultations.

Specialized personal health care services are delivered by county and municipality-owned hospitals and outpatient clinics.

4.3 The Role of ICT in Prevention and Treatment of Chronic Diseases in Lithuania

The Ministry of Health is the leading ministry responsible for the development of eHealth policies in Lithuania. In 2007, the Lithuanian eHealth Strategy Project for 2007-2015 was approved by the eHealth Development Coordination Board and signed by the Minister of Health.

The general objective of the eHealth strategy are an easier access to information and services, better and patient-focused healthcare services, increasing citizens’ awareness and involvement in protecting their health, and a transparent and efficient use of healthcare resources. Target groups of the national eHealth strategy include patients, citizens and health care professionals.

Legislation and coordination: The regulatory basis of the eHealth Development Strategy 2007 – 2015 was the Lithuanian Health Programme, the action plan for a European eHealth Area\(^\text{32}\), the Communication from the commission of the European Communities “i2010 – A European Information Society for growth and employment” and the Electronic Government Concept. The eHealth strategy was facilitated by several preceding legal acts:

- National Development Plan

• National Concept of Development of Information Society and National Strategy of Development of Information Society

• Strategic Activity Plan of the Ministry of Health for 2003

• eHealth Development Strategy 2005 – 2010


The eHealth strategy development is coordinated by the Minister of Health, the Coordination Board of eHealth Strategy Development, the Division of eHealth Strategy Development of the Ministry of Health, the Committee of Informational Society Development of the Government and the National eHealth System Manager.

National Electronic Health System (NESS): The key objectives of the eHealth strategy are to be achieved by the means of a National Electronic Health System (NESS). The strategy provides for several fields of activities. In the following, the project ‘eHealth sevices’, the electronic health record, the Internet Patient Card, the health portal, the Advanced Patient Registration System and the Telemedicine Research Center are described.

The project eHealth services is one of the main fields in the development of NESS. It includes implementation of the main hospital information system in three regional healthcare institutions (in Kaunas, Klaipėda and Vilnius) and integration of these systems to the National electronic health system in compliance with all international standards. Further expansion will cover the entire country. The National electronic health system will enable faster exchange of data on the patients’ treatment services, procedures, laboratory tests and results among healthcare institutions.

Currently, Vilnius University Hospital Santariškių Klinikos (VUH SK), the Lithuanian University of Health Sciences Hospital (LUHS), and Klaipeda City and some other hospitals have implemented a health information system. They also implemented a picture archiving communication system (PACS), financial accounting and personnel management systems, documentation management, and several other systems essential to top-standard performance of the health care institutions.

An important aspect of the eHealth services project is the development of the necessary legal regulations. By providing technical assistance, the consultants “Ernst & Young Baltic” ensure the quality control for the implementation of the above mentioned hospital information systems and
also provide foundations for the legal regulation and secure functioning of NESS in the form of methodical recommendations and model documents. Beside this, they aim to ensure that there are no essential fears among the members of society that the information collected for electronic health record is kept secure and confidential.

Another very important activity is the development and implementation of an electronic health record (EHR), which is being developed gradually. In the beginning, the functions will be restricted to carrying the critical patient health data. Successively, the functions will be extended, for example to clinical data transferral, electronic prescription and electronic reimbursement. At the end of EHR implementation, all relevant information will be processed automatically. It will be available to authorized users and can be used for clinical decision support.

During the last five years, electronic medical records have been developed at the VUH Santariškių Klinikos, which accumulate descriptions of laboratory and instrumental analyses, surgery protocols, epicrises, and other electronic clinical documents as well as images. Most of the documents are stored in the database and can be viewed on a computer significantly earlier than the paper version reaches the attending doctor.

The Internet Patient Card, developed and implemented within VUH Santariškių Klinikos, is a system, which for the first time in the history of Lithuania enables the patients or their authorized doctors to read the medical records at home or at GENERAL PRACTITIONER's offices. Although the system is already operating, the project is still under construction. It is planned to upgrade the system by the possibilities of the identification measures, which are being implemented by national telecommunication service provider Omnitel. All the efforts were made to make sure that as many documents as possible were created by electronic means, so that they could in turn be included in the Internet Patient Card. It is also planned to develop special facilities that will allow the patients to supplement their own Internet patient cards: enter the data of body temperature, blood pressure, medications taken, health complaints, even pictures and other electronic files. The system aims at becoming a national system, where the patients or their authorized doctors could review the clinical documents created in VUH SK as well as results of analyses performed in other institutions of the country, medical records extracts, etc.

In September 2006, Lithuania started the implementation of the eHealth application Advanced Patient Registration System at the VUH Santariškių Klinikos. Usually, health care institutions carry out the advanced registration of patients through paper journals or the patients arrive at their doctors without registering in advance. The disadvantages of this procedure are:

- Patients waste their time on registration and waiting to be admitted to the doctors
- Limited choices for the patients
- Inefficient use of human resources at health care institutions;
- Inefficient management of health care institutions due to insufficient information flows.

The project is implemented on a national scale, seeing that only a common system, which integrates the registration systems of individual health care institutions, can enable efficient use of the allocated funds and provide the possibility to select the services of specialists of different health care institutions to the patients.

Since 2008, patients can register for visits to a doctor and receive information on services provided by health care institutions using the telephone (number 1815) or the internet portal www.sergu.lt. In addition to that, the electronic advanced patient registration system allows:

- the patients to select the doctors from various health care institutions
- an automatic (via SMS or e-mail) notification to the patient of the pending visit, cancellations, reminders, etc.
- for patients who registered through the system, to monitor all the planned and previous visits on the Internet
- consulting doctors to become familiar in advance with the data of the arriving patients
- the appointing doctors to issue an appointment (which can be printed out or electronically attached to the data of the planned visit of a patient) and monitor the visits of patients appointed by them

36 Vilnius University Hospital Santariškių Klinikos, http://www.santa.lt/index.php?-899226318
• the administrators of the institution to see the planned workload of the doctors and distribution of patients, to automatically receive statistic reports and other information, to analyse the patient registration process (times, numbers, what patients are registering, etc.), and to plan the management of the institution, based on the relevant data.

The **Telemedicine Centre** of Lithuanian University of Health Sciences Hospital is the leading research centre involved in the promotion and provision of telemedicine type solutions and services in Lithuania. The mission of the Telemedicine Centre is to initiate, form, and introduce telemedicine developments at the university and in the country, and to prepare policy recommendations for health care institutions and government institutions. Key priorities of the centre activities include:

1. Provision of methodical leadership in the application of telemedicine technologies for medical diagnostics
2. Consultation, monitoring, and scientific investigations in all stages of related studies
3. Navigating through the programmes and sources of financing which could stimulate the development of telemedicine
4. Organisation of discussion sessions and conferences on telemedicine
5. Organisation of and participation in national and international telemedicine projects.

The services of the Telemedicine Centre range over the following application fields: tele-consultations and second opinion, distance education, image processing, as well as information exchange, and creation of international databases.

**Milestones of eHealth system development:** According to the Ministry of Health, there are three phases of eHealth system development.

The first phase took place the time period 2007-2010. At the end of this phase, the basic components of the National Electronic Health System (NESS), including support facilities and infrastructure, were prepared. All healthcare institutions should have access to NESS services and

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36 The Telemedicine Centre website [http://tmc.kmu.lt/](http://tmc.kmu.lt/)
may integrate their own local information systems. The system for electronic prescription, for clinical data collection and transferring, and for electronic reimbursement and report generation should be implemented in NESS.

The actual implementation of NESS proved to be very slow and difficult. A survey\textsuperscript{38} conducted between November 2009 and February 2010 revealed that health care institutions were willing to implement to implement NESS in the next years – especially electronic administration (78\% of all responding health care institution head administrative staff), electronic reimbursement (47\%) and institutional electronic patient records (47\%). The NESS functions electronic prescriptions (4.4\%), picture archiving and communication system (PACS, 8.8\%), electronic laboratory results (11.8\%) and telemedicine (13.2\%) services were less favored. The survey also demonstrated a lack of competence and knowledge in eHealth system implementation in most health care institutions (78\%).

In the second phase from 2011 to 2013, the use of the eHealth record system and access to the NESS client services is expected to be wide spread among GENERAL PRACTITIONERs, primary health care institutions and other healthcare institutions. The basic functions, which were implemented in the first phase, - such as exchange of data from laboratory and instrumental investigations (including visual data), electronic prescription, statistical data collection and eReimbursement - will be running. An eHealth quality control system is being established and international compatibility testing is being performed. An assistant for clinical decision-making, a patient supervision, and telemedicine solutions will be added to the eHealth system.

In August 2011, the Amendment to the Act on the Lithuanian Health System, which legally establishes a national eHealth system, was approved by the Lithuanian Parliament. This means that in the future patient data will be managed electronically\textsuperscript{39}.

The number of electronically prescribed medicines is foreseen to increase to 50\%. At least 20\% of residents will be using direct eHealth system services and all sick-lists will be managed using eHealth instruments.

In the third phase from 2014-2015, patients and residents are actively taking part in eHealth; the use of eHealth information tools is extended to all patients, GENERAL PRACTITIONERs, primary

\textsuperscript{39} Act passed to legally establish the Lithuanian eHealth system, http://www.ictparliament.org/node/3878
health care institutions and hospitals. eHealth solutions are used for comprehensive research and management of health care. A focus will be on eHealth quality control and data archiving system. The Lithuanian eHealth system will be ready for integration to the European eHealth system.

The Lithuanian health care system pursues two priorities: health protection and disease prevention. The problem of the burden of chronic diseases is met with

- collecting data through research and eHealth
- developing preventive programmes for chronic diseases and patient education
- support of patients with chronic diseases.\(^{40}\)

eHealth plays an important role in all of these strategies to reduce the burden of chronic diseases. Although no particular eHealth solutions are developed solely for the use among chronically sick people, the more often a person gets admitted to the doctor the more digital medical data accumulates. Since elderly persons and/or chronically sick persons request medical aid much more often than others, they benefit a lot going through the whole ICT process. Some examples are presented in the following.

The EHR is designed to serve – in a later stage - for statistical data collection. This data can be used for comprehensive research on chronic diseases. The data and research results can be used for evidence based decisions in individual and public health care.

The implementation of prevention programmes and for patient education can be facilitated by using eHealth applications. The national electronic health system includes the implementation of a health portal, which is intended to provide an overview of the development of eHealth services in Lithuania and to answer frequently asked questions about the consequences of services to citizens and professionals. The information made available through the internet and especially the health portal can be used for educational purposes. The Internet Patient Card, which is also part of the NESS, enables patients and citizens (and eventually health care professionals in the local public health offices) to monitor their health data. This knowledge, for example about blood pressure, may help them to prevent chronic diseases or to moderate the course of the disease by changing or adapting their life style.

Patients with chronic diseases also take particular advantage of the Advanced Patient Registration

\(^{40}\) HOPE - European Hospital and Healthcare Federation. 2010. Chronic diseases - A clinical and managerial challenge
Output No. 3.3.1
Report on health care organisation in the partner regions and the role of ICT in prevention and treatment of chronic diseases

System, which is part of the NESS. Chronic diseases require many additional visits to GENERAL PRACTITIONERs and hospitals, which can be better organised by using the Advanced Patient Registration System, resulting in less time spent and better health care supply due to improved information flows.
5 Sweden

5.1 Sweden and the Region of Skåne - Background and Statistics

Sweden consists of 9 million inhabitants. The Region of Skåne (with a population of 1,25 million) is the region in Sweden which is most southern. Highly specialised care is provided for another 0,6 million inhabitants in southern Sweden, all together a population of almost 2 million.

The budget for health care in the Region of Skåne is 25 billion SKr paid by taxes and including payment from other counties for highly specialised care, to that also 32 billion SKr (3,5 billion euros) in other fees. The taxes paid to the Region of Skåne is 10,39 % of the inhabitants incomes. About 80 % of those taxes are used for health care. In Sweden, taxes are paid at three political levels – the state, regions, and the municipalities. The state finances the universities and the education of medical personnel. The main purpose of the regions is to finance and administrate health care. Fees are charged for visits to health centres and for visits or stay in hospitals, but provide for a very small part of the total cost. Private health insurances are complement but for a small part of the population. The municipalities are responsible for the care of elderly people including home-help services, various other support services and nursing homes. The social services also include basic health care provided by nurses.

5.2 Health Care Organisation in Sweden

Hospitals are mainly public, run by the regions, and have a large number of outpatients. General practitioners centres are financed by the regions, but an increasing number are run by smaller or bigger companies. From 2010, a new law makes it possible for private General practitioners centres to compete with public centres under the same conditions. In the Region of Skåne, the hospitals are paid through a system of diagnosis-related groups (DRG). General practitioners are paid per listed patient adjusted to health, age, and socio-economic factors. The local municipalities provide social services for their citizens. The municipalities are responsible for the care of elderly people including home-help services, various other support services, and nursing homes. The social services also include basic health care provided by nurses.

A lot of work has been made to coordinate the care of elderly people between hospitals, General practitioners, and the local municipalities, but a lot of work remains. In Skåne, there are 10 hospitals. Out of the ten, the smallest is run by a private company but all other are public -
The hospitals still have large number of outpatients and General practitioners only have around 58% of outpatient visits in Skåne. The goal is that General practitioners will increase their part up to 70%. General practitioners get an extra bonus if their patients have more than 60% of their outpatient visit by the General practitioners.

In Sweden, large efforts are made to improve the care of the “most ill elderly persons”. The demographic change to more elderly inhabitants will in Skåne increase the need for hospital beds by 150% over the next 25 years, if nothing is done. The strategy is to increase the cooperation between hospitals, general practitioners, and the care in the municipalities. eHealth solutions are very important for this work.

Unlike most other European countries, access to healthcare has been a problem in Sweden - both for operations and for consultations by a specialist. This has improved over the last two years. The government in Sweden has a bonus system for regions with a good access to healthcare. One billion SKr are shared among regions with the demanded access time - 70% of the patients in 60 days.

The current priorities in Skåne are to further improve: Psychiatric care, Cancer treatment, Palliative care.

5.3 The Role of ICT in Prevention and Treatment of Chronic Diseases in Sweden

The overall eHealth strategies in Sweden and hence in Skåne are to implement eHealth services for patients and other inhabitants, to develop and coordinate an eHealth services for health care, and to build a technical infrastructure, for example secure communication and administration of
patient information.

The following goals should be achieved by the end of 2012:

- Patients in all regions shall have the possibility to read his/her own patient record via the internet. E-Mail communication should be secure, including the online booking of appointments at health care centres. More information and interactive eHealth services should be developed.

- All regions shall have “Nationell Patient Översikt” (national patient overview), which means the possibility for health care personal to read the patients record across the country, from all health care suppliers - public or private. (Depends on patient accept)

- A complete list of a patient’s medication available throughout the whole country.

- More patient record systems should have an automatic linking to quality registers.

- In the communication between health care suppliers, the infrastructure follows the legal demands for security.

- Common document for national IT-architecture in eHealth

Sweden is coordinator of the EU project epSOS – Smart Open Services for European Patients. This project handles patient information between the countries and electronic prescriptions of drugs.

The following will describes few examples using ICT in the Swedish Health Care System. The first two of them are the basis for ICT used between the health care and the citizens.

1177: This is the telephone number to health information in Sweden. Today this is also an interactive site www.1177.se where the inhabitants can get a common national, reliable, easy to read information without any cost. The information includes prevention and self care. This servives operates on a 24 hour basis, and has over two million visits per month.

My healthcare contacts (www.mina.vardkontakter.se): This is a website for the patient contacts with healthcare. A lot of this contact was earlier on telephone. It is partly implemented. At this early state the patient can already use it to change time for outpatient visits, asking questions to their doctor or asking for represcription of drugs.
**Nationell Patientöversikt** (national patient overview): Makes it possible for health care personal to read patient records over the whole country from all healthcare suppliers -public or private. (With the patient’s acceptance).

**A complete list of patient medication** (Pascal): A separate project but will be a part of national patient overview. Will work in the entire country by 2012. This is a huge quality improvement as from now on every health care supplier will see the same information about medication.

**EiRA**: Supplies health care personal with electronic scientific newspapers at the moment about 850 different medical papers.

**Patient records** with automatic linking to national quality registers. From 2010 a work has started to adjust the quality registers to make it possible to get the information direct from the patient record which means less work and better information.

**Open results**: A large number of quality results are published on the net from healthcare but also results from care in the municipalities. Those results are of great interest from the political decision makers.

**Standard plans for health care**: Standard procedures for patient care increase patient safety. Another advantage is that documentation is standardized and less time is spent.

A national strategy for eHealth was decided by the Swedish parliament in 2006 and the work started in all counties (landsting) the same year. The regions started to work together and for the years 2007 to 2009 with a common budget of 200 million SKr per year. The first years with the target to get a common infrastructure. For the years 2010 to 2012 the budget has increased to 300 million SKr per year and an organisation was created “Centre for eHealth in cooperation – CeHis”.

For the years 2010 to 2012 the work with a national eHealth has 3 main targets:

- The individual as a citizen or as a patient shall have access to quality assured information of health and diseases. The patient shall be able to read his or her patient record via the internet and have the possibility to use different interactive eHealth services.

- Personal shall access to a secure information and communication system to make the daily work easier and with higher quality. Access to more structured information shall be a good
background for decision about treatment.

- Decision makers shall have good information of quality and security in health care. Management shall be grounded on good information. Research shall have access to data of high quality with respect of individual integrity.

The Swedish “National Strategy for eHealth” combines action areas and clear statements on governance and stakeholder involvement as well as financing. The action areas mentioned in the document are:

- Bringing laws and regulations into line with extended ICT use
- Creating a common information structure
- Creating a common technical infrastructure
- Facilitating interoperable, supportive ICT systems
- Facilitating access to information across organisational boundaries
- Making information and services easily accessible to citizens.

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42 Ibidem, page 18
6 Poland

6.1 Poland and Pomeranian Voivodeship - Background and Statistics

The total area of the Republic of Poland is 312 679 km square with about 38 million inhabitants, making it the sixth most populous country in the European Union. From 1 January 1999, three levels of territorial division of the state was conducted, according to which it is composed of communes, districts, and vovodeships. In Poland, there are 2 478 communes, 314 districts, 65 cities with district rights and 16 vovodeships.

The Pomeranian Voivodeship is located at the Baltic Sea at the mouth of the Vistula River. Gdańsk is its capital city – a city with a population of almost half a million inhabitants nowadays. Pomeranian Voivodeship is divided into 16 districts and 4 cities with districts rights. The map below shows the location of the Pomeranian Voivodeship in Poland, as well as the Lębork District.43

![Figure 2: The health care system in Poland](http://commons.wikimedia.org/wiki/File:Map-_PL-_powiat_leborski-_miasto_Lebork.PNG)

6.2 Health Care Organisation in Poland

The right to health care and the right to health care services financed from public funds are rights guaranteed by the Constitution of the Republic of Poland.

43 http://www.nationmaster.com/encyclopedia/Poland
44 Source: http://commons.wikimedia.org/wiki/File:Map_-_PL_-_powiat_leborski_-_miasto_Lebork.PNG
As a result of the Parliamentary Health Committee of the Sejm of the Republic of Poland is The Act on healthcare services financed from public funds adopted on 30 July 2004. The Act defines duties of public authorities cooperating with the state to protect citizens’ health. Public authorities are responsible for providing citizens an equal access to health care services financed from public funds.

Conditions and scope of services, duties of public authorities in providing access to them are regulated by the laws:

- The Act on healthcare services financed from public funds,
- The Act on Medical Activities

In both acts are defined rules and procedures of financing of health insurance, which is based on social solidarity. This means that each insured, regardless of how high premiums he pays, receives the same benefits of health care. In 2011, premiums paid for health insurance is 9% of the base (usually income)\(^45\).

**Responsibilities of local authorities for health**

Responsibilities of local authorities about health care services are regulated by the Act on healthcare services financed from public funds of 27 August 2004, the Act on Commune Self-government of 8 March 1990, and also Act on the District Local Self-Government and Voivodeship Self-government of 5 June 1998.

Responsibilities of local self-government authorities in healthcare:

**Communes - primary health care**

- Development, implementation and evaluation of effects of health programs under the health needs and health status of inhabitants in a communes;
- Providing information about the implementation of health programs;
- Initiate and participate in the local projects aimed at acquainting the inhabitants of substances hazardous to their health.

**Districts - health care facilities and smaller hospitals:**

• Development, implementation and evaluation of effects of health programs under the health needs and health status of residents of the district - after consultation with the relevant territorial local authorities;
• Providing information to the voivodeship marshal about implemented health programs in the district;
• Initiate, support and monitor the activities of local self-governing community about health promotion and health education conducted in the district;
• Actions to stimulate individual and collective responsibility for health and health care;
• Undertake other activities, identified by health needs.

Voivodeships - hospitals of voivodeships, specialist hospitals and specialist clinics:
• Development, implementation and evaluation of health programs effects which are identified by health needs and health status of residents of the voivodeships - after consultation with the relevant territorial communes and districts
• Providing information to the governor of the voivodeship about implemented health programs;
• Foster and promote solutions to increase efficiency, including the restructuring of health care
• Taking any other action as a response to identified health needs of its population46.

Financing
Health care in Poland is financed from several sources of funding - public and private. Health insurance is a basic part in the Polish system of health care financing - income from premium health insurances has deliberate nature of the tax, and these funds are collected in the National Health Fund (NFZ).

The second largest source of health care sector financing is the budget of the state, which is collected by applying different fiscal instruments and general taxes. Funding for the health care system is also provided through the budgets of local governments whose revenues come from local taxes and fees, from the state budget transfers and special funds outside the budget (for example Labour Fund and Social Insurance Fund) and in a small part from the social organizations (associations, foundations, etc.).

46 http://www.gdansk.pl/nasze-miasto,689,3938.html
Direct patient charges for medical services relate to services which are not funded from the state budget or health insurance. Medical fees cannot be reimbursed for example, if the patient does not have health insurance or facilities that provide services do not have a signed contract with the payer (National Health Fund). In the private sources of financing health care important are the patient's own resources, the funds of the workplaces (employers), private health insurance funds and charitable funds (not subsidized with public funds).

Today in the Polish Health Care System we can divide the following sources of funding:

- Health Insurance
- The state budget
- The patient's own resources (to make direct payments by users of medical services, such as drugs, dental and orthopedic)
- The financing of quasi-insurance-based benefit packages purchased by companies for the employee or his family\(^\text{47}\).

**Participants of the health care system in Poland**

Participants in the health care system in Poland:

- **Beneficiaries - patients**
- **health insurance institution as the payer - the National Health Fund**
- **providers - therapeutic agents** (according to art. 4, paragraph 1. the Act about Medical Activities of 15 April 2011)
- **authorities of control and supervision:**
  - the Ministry of Health, which sets out guidelines for national health policy and has powers to control, and operating at the national consultants in various medical specialties
  - the State Sanitary Inspection ("Sanepid"),
  - of the State Pharmaceutical Inspection,
  - of governors of Voivodeship and public health centers and consultants in the various medical specialties of Voivodeship,

The main institution that provides and finances the provision of health care for the insured and entitled persons to health care services is the National Health Fund. It is composed of headquarter and 16 regional branches.

**The National Health Fund** (NFZ) is a state organizational unit fill in the Polish system of health care function of payer with funds from the mandatory health insurance premiums. NFZ determines the quality and availability, and analyzes the costs of health care services to the extent necessary for the proper contracting of the provision of healthcare services. Its job is also holding contests offers, negotiations and conclusion of agreements for the provision of healthcare services, monitoring their implementation and accounting. NFZ finances the provision of health care provided to beneficiaries other than the insured who meets the income criteria. It also deals with the development, implementation, execution and financing of health programs.

NFZ also: monitors medical ordination, promotes health, keeps a central list of insured, conducts publishing information and promotion of health, coordinates and reimburses benefits provided to insured within the European Union.

### 6.3 eHealth Strategies in Poland

**National Level**

In Poland, at the central level has been developed The Informatization Plan "e-Health Poland" for 2009-2015, which sets out the main directions of development of informatization in health care. The document was based primarily on a "Strategy for Information Society Development in Poland until 2013" and "Strategy for Republic of Poland - e-Poland" –is the prolongation of the activities related to health care. In developing the document were taken into account the recommendations of the European Commission in regard to the e-Health48.

The main objectives of this eHealth strategy:

- Facilitating access to information from health care
- Improving the efficiency of the electronic exchange of documentation in the health care system
• Establish procedures, guidelines, collect and share good practices aimed at improving the management of the health care institution. Better use for building capacity in counter, data communications systems

• Modernising medical information system to analyze the demand for health services performed

• The practical realization of the construction of IT solutions in health care consistent with the guidelines of the European Commission to allow the inclusion Republic of Poland in the interoperable area of electronic medical record (EHR - Electronic Health Record).

As the civilization of society, rapid acquisition of reliable information becomes crucial. Technological possibilities offered by emerging information technologies - Internet, e-mail or cell phone, create such conditions. With the growing number of Internet users also increases demand or information on health care issues, both informational and training.

Acquisition, processing and storing data in a traditional manner associated with a long time waiting for information, involvement of many employees in the process of collecting and aggregating data often generate a problem if you need quick access to the stored information. The life often depends on the time we need to get information - the development and improvement of technology And electronic information flow is very important.

The implementation of the nationwide Medical Information System will provide an opportunity to obtain a complete set of objective and comparable data across the country about provided medical services. It will also help to assess the extent of availability of medical services. This will allow access to reliable, comprehensive information, and will allow rational planning of targeted actions in health care. The system will also allow monitoring of the using funds allocated for health care. Created based on specific standards and national norms databases of information will ensure reliability and comparability of data and can be an analytical tool for planning health care policy at all administration levels.

6.3.1 The national eHealth projects

Specific activities for e-Health have been defined in the document eEurope 2005 Information Society for All and the document eHealth Action Plan in 2004. The signing of these documents has committed the European countries to the developing the ICT in health care sector. The Centre of

Health Information Systems as a unit of the Ministry of Health, which is the Implementing Institution has prepared The Health Care Information Program.

The program consists of 6 projects, but now 2 are implementing:

- Project P1: Electronic Platform for collecting, analyzing and distribution of digital content of medical events,
- Project P2: Sharing Platform Entrepreneurs On-line Services and Digital Content Medical Records.

Another project that is expected to launch is project P3: Systems associated with reconstruction, adjustment, maintenance and monitoring records and other health resources by public bodies, including state administration and local government – HealthCare Registry Platform. These projects are financed by the European Regional Development Fund, Operational Programme Innovative Economy 2007 - 2013 Priority VII Information Society - establishment of electronic administration. These projects will make available the basic functions of eHealth platform, such as support for the Electronic Patient Record (EHR), e-prescriptions on-line registration, electronic referrals, patient online accounts, electronic exchange of sick leaves, etc. It will allow more effective healing process of patient integration, reduce costs and allow in real time comprehensive monitoring of provided health services.

Regional level
Pomeranian does not have a separate strategy for the development of eHealth technologies. However, the measures implementing the Informatization Plan "e-Health Poland" for 2009-2015 is implementing on its territory.

6.4 The role of ICT projects in prevention and treatment of chronic diseases in Poland
In recent years in Europe, there is an increase in average life span and decline in birth rate, what leading to an aging population and rising health problems specific to elderly people. There are three main causes of deaths in Poland: cardiovascular diseases, cancer and injuries caused by external factors.

49 http://www.mz.gov.pl/wwwmz/index?mr=m17&ms=795&mi=pl&mi=795&mx=0&ma=16749
Due to the growing trend of morbidity, the high cost of treatment associated with a large number of hospitalization and social inconvenience, serious health problem are also diseases of the respiratory system, digestive system, diabetes and mental disorders and diseases, although the mortality caused by these diseases is much lower than the three groups of diseases listed in the first place.

Many medical centres in Poland involved in monitoring the electrocardiogram of patients over the phone - this field of telemedicine in Poland enjoyed the greatest success. This kind of telemedicine is incredibly important for the elderly or disabled, stranded at home or unable to transport. In the case of chronic diseases such as heart disease, diabetes, hypertension, chronic obstructive pulmonary disease, asthma and kidney failure is also very important, but from 2000 on these issues is not made great progress in Poland.

The implementation of further ICT projects in Poland needs more time. Cardiologists believe that the development of cardiac patient care is health telemonitoring is really important. This role will fall primarily family physicians. It is assumed the intensive development of this area within 5-6 years. By the contact with the patient via modem connected to mobile phone will be possible on a large scale control of heart rate, pressure or blood sugar levels. These changes will effect shorter time to consult cardiology professionals.

Unfortunately, e-Health technologies, even though the fact that are the real and alternative way to reduce the cost of medical care in Poland, are not yet very popular for patients. Provision of medical services at a distance or more generally the use of electronic communication in medicine is related to accepting this method by the medical professionals and also patients.

The role of health institutions should focus on creating the conditions for the development of these benefits. First of all, it needs to prepare guidelines and technological standards of their provision. An important aspect is also identifying the benefits and promoting best practices in this regard. We should notice that the development of telemedicine has many opportunities in different fields of medicine such for example uploading images to describe the radiological examine, results for the
consultation or computer hearing test program.

The most important issue of The Informatization Plan "e-Health Poland" for 2009-2015 and its projects is to set themselves the task of creating conditions for continuous improvement of public awareness about the opportunities and benefits of e-Health services development. The projects involve the ability of citizens and persons residing in Poland, access to information about their health and dispose of such information, regardless of current location. The Informatization Plan "e-Health Poland" for 2009-2015 develops a wide range of services in the e-Health - telemedicine systems (teleconsultation, telemonitoring, registration "on-line" patients through the Internet), electronic prescriptions (e-prescription), and electronic health card, which can be combined with a new ID.

The Informatization Plan "e-Health Poland" for 2009-2015:

**Easier access to information relating to health**

Technological possibilities - Internet, e-mail or cell phone create such conditions for the rapid acquisition of reliable information on health problems.

**Improving the efficiency of the health care system of electronic circulation of documents**

Health and human life often depends on the time to obtain information. The efficiency of the institution, whose activities depends on the speed of decision making, should be develop and improve by technology – electronic information flow is crucial.

**Medical information systems**

The implementation of a nationwide health information system will provide an opportunity to obtain a full set of objective and comparable data across the country for provided medical services.

**The practical realization of the construction of IT solutions in health care consistent with the guidelines of the European Commission to allow the inclusion of Republic of Poland in the area of "interoperable" electronic health records (EHR - Electronic Health Record)**

In Poland, the activities in this area should be complementary to the programs implemented by the European institutions which are creating solutions that enable interoperability between systems and meet the conditions for increased mobility of Polish citizens. The European area of operations

50 Kasztelowicz P., Internet medyczny i telemedycyny, [w:] Technologie informacyjne w medycynie pod redakcją
electronic medical records is one of the conditions to be met by systems implemented in such a way that medical data can “follow” the citizen wherever he is.

**Improving the efficiency of public spending on health care financing**

It is essential to the construction of system tools allowing:

A. The implementation of the authorization of each medical transaction by the patient - the beneficiary of the transaction.

B. Monitoring and publishing information of the effectiveness of public spending by payers.

C. Monitoring the cost of services by service providers and publishing such data.

Dissemination of knowledge about the opportunities of eHealth technologies will effect on prevention activities and treatment of chronic diseases – eHealth technologies will become more common for elderly population. Activities of the National Health Fund, which finances the majority of medical services in the Polish health care system also enforce electronic data exchange and causes the interest of health sector on the development of ICT facilities in connection with provided medical services.
7 Conclusion

This report shows that the degree of ICT-deployment in the health care sector differs from country to country. It depends on the interplay of several aspects, like standard of technology, degree of urbanisation, political decisions and framework of political agreements, national health care organization, and much more.

In each participating country, strategies or agreements to enhance the implementation and the future development of eHealth have been developed at a political level. This is a prerequisite to the further development of ICT in the health care sector. As shown in the report, the daily work in the health care sector can be improved and optimized though the use of eHealth (ICT); here, large as well as smaller eHealth projects are subject to accommodate modules.

The report on health care organization in the partner regions and the role of ICT in prevention and treatment of chronic diseases and the report Examples of Good Practice Use of ICT in Healthcare and its potential Transferability points to several good cases in prevention and treatment to learn from. In both reports, measures that tackle the challenges and problems related to the demographic change are presented. In this way, eHealth becomes an important and essential part of the health care sector.

In the project, this report is used as a building block for the output 3.2.2 Established Benchmark system including sustainable running phase – when it comes to sustainability, it is the intention to further compare the themes presented in this report and compare the results between the participating countries in the benchmark system.
8 List of References

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Stroetmann, Karl A. u.a (2011).: eHealth policy progress in European countries, In: European
countries on their journey towards national eHealth infrastructures – evidence on progress and recommendations for cooperative actions – Final European progress report eHealth Strategies


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http://www.ictparliament.org/node/3878

http://www.wikipedia.org

http://www.destatis.de

http://www.gematik.de Deutsche Gesellschaft für Telematik

http://winfuture.de/news,50226.html

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http://www.rn.dk/Regionen/English/Organisation.htm

http://www.regionsyddanmark.dk/wm228953


http://www.hus.fi/default.asp?path=59,404,4024

Report on health care organisation in the partner regions and the role of ICT in prevention and treatment of chronic diseases


http://tmc.kmu.lt/ The Telemedicine Centre website


http://www.ehealthforregions.net/news/11_10_05_PrimCare_IT_approved.php


http://www.sam.lt Strategic Goals of the Ministry of Health


http://www.santa.lt/index.php?-899226318 Vilnius University Hospital Santariškių Klinikos


http://statistik-portal.de Statistische Ämter des Bundes und der Länder: Bevölkerung am Monatsende
9 List of abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>BSR</td>
<td>Baltic Sea Region</td>
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<tr>
<td>ICT</td>
<td>information- and communication technology; is used in the same meaning as eHealth in this report</td>
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<td>eHealth</td>
<td>healthcare practice supported by electronic processes and communication; is used in the same meaning as ICT in this report</td>
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<td>EHC</td>
<td>Electronic Health Card</td>
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<td>EHR</td>
<td>Electronic Health Record</td>
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<td>Health insurance company</td>
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<td>SHI</td>
<td>Statutory health insurance</td>
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<td>DMP</td>
<td>Disease management programme</td>
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<td>NESS</td>
<td>National Electronic Health System (Lithuania)</td>
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<td>VUH SK</td>
<td>Vilnius University Hospital Santariškių Klinikos</td>
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<tr>
<td>PACS</td>
<td>Picture archiving communication system</td>
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<tr>
<td>EU</td>
<td>European Union</td>
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<tr>
<td>NESS</td>
<td>National Electronic Health System</td>
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<tr>
<td>GP</td>
<td>General practitioner, family physician</td>
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<td>RSI</td>
<td>eHealth Organization of the Danish Regions (Regionernes Sundheds-IT)</td>
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Appendix 1: Quality Review Note

Reviewer: Werner Smidt
Organisation: EFT
Date: 03.07.2012
Quality accepted? Yes

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<th>Criteria</th>
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<td>1.</td>
<td>Does the short abstract provide information about the aim of the output, the methods used, the main results and the benefits for the project partners and stakeholders?</td>
<td>Yes</td>
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<td>5.</td>
<td>Are the main results and conclusions of the output linked to the aims of the output? Are they clearly described, plausible and realistic and/or feasible?</td>
<td>Yes</td>
<td>Some practical results could be better described.</td>
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<td>Are there innovative findings that are an added value for the project and/or for stakeholders?</td>
<td>Yes and No</td>
<td>Some results are missing</td>
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<td>Yes</td>
<td>Very good</td>
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<td>Is the output well structured and easily understandable?</td>
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<td>Yes / No</td>
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<td>Did the author use the template for project outputs?</td>
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<td>12.</td>
<td>Is the quality of the output acceptable for publication on the project website, both in terms of content and formality?</td>
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<td>If adding some more highlights will be good for publishing</td>
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### Appendix 2: Checklist Editing

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