The Danish Centre for Health Informatics, DaCHI (former Virtual Centre for Health Informatics, V-CHI), was established in 1995 to coordinate research activities within the field of health informatics at Aalborg University. Scientists from now six departments are participating in the centre: Department of Health Science and Technology, Department of Communication and Psychology, Department of Development and Planning, Department of Mechanical and Manufacturing Engineering, Department of Business and Management and the Department of Sociology and Social Work.

This annual report presents the accomplishments of 2015. The research activities of the departments participating in the centre are introduced by a description of the projects and by the publications that communicate their research. Furthermore, the open meetings and conferences held in 2015 are mentioned in the report together with the centre’s network activities.

CHRISTIAN NØHR
Professor and director of Danish Centre for Health Informatics
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aCHI operates within research and development and offers counselling and teaching of health informatics to the health care sector. DaCHI is a formal network between Danish universities, public and private companies, organisations, hospitals and regions. The interested parties are represented in a “Reference Group” and the daily activities are managed by an executive committee and the director of the centre. The affiliated researchers represent three faculties at Aalborg University. The DaCHI secretariat is located at Aalborg University.

MISSION
DaCHI’s mission is to expand and develop the mutual understanding and interaction between health informatics and the health care institutions, health professionals and the citizens.

NETWORK OF RESEARCHERS AT AALBORG UNIVERSITY
DaCHI is embedded in the research environment at Aalborg University where several departments collaborate in a number of health informatics research projects, i.e. Department of Health Science and Technology, Department of Communication and Psychology, Department of Development and Planning, Department of Sociology and Social Work, Department of Mechanical and Manufacturing Engineering and Department of Business and Management. The DaCHI research network is associated with a wide range of network partners, i.e. North Denmark Region, Central Denmark Region, The Danish Institute for Health Services Research, Centre for Health Telematics, CHI – Vendor Forum (CHI-Leverandørforum), Aarhus University and Aalborg University Hospital. Through the anchoring of DaCHI at Aalborg University and the wide range of competences of our network-partners, we provide an interdisciplinary understanding of health informatics research.

RESEARCH WORK
DaCHI primarily works within the following health informatics research areas:
• user interface and usability
• technology assessment and implementation
• organisation and management
• clinical decision support systems
• clinical information systems and EHR
• quality development and assurance
• user driven innovation
• clinical work practice
• welfare technology
• patient safety

other competences are:
• network creation and management
• research and knowledge sharing between university, industry and clinic
• education and training
• project fund raising and management

In addition, The Master Programme of Health Informatics is a DaCHI activity. The two-year programme primarily employs teachers from Aalborg University, but also external lecturers from clinic, industry and public sector are connected to the programme. This variety of teachers ensures that the programme is aligned with the requirements from the industry and public sector.
THE FOLLOWING RESEARCHERS AT AALBORG UNIVERSITY PARTICIPATE IN THE NETWORK DACHI

André Kushniruk, Department of Development and Planning

Ann Bygholm, Department of Communication and Psychology

Anna Marie Høsten, Department of Health Science and Technology

Anne Marie Kanstrup, Department of Communication and Psychology

Anne Marie Lassen, Department of Development and Planning

Anne Randorff Højen, Department of Health Science and Technology

Christian Nehr, Department of Development and Planning

Helle Wentzer, Department of Communication and Psychology

Janne Seemann, Department of Sociology and Social Work

Karsten Niss, Department of Health Science and Technology

Kirstine Rosenbeck Gøeg, Department of Health Science and Technology

Lars Botin, Department of Development and Planning

Lars H. Ehlers, Department of Business and Management

Lasse Riis Østergaard, Department of Health Science and Technology

Lone Stub Pedersen, Department of Development and Planning

Louise Pape-Haugaard, Department of Health Science and Technology

Ole K. Hejlesen, Department of Health Science and Technology

Pernille Bertelsen, Department of Development and Planning

Pia Elberg, Department of Health Science and Technology

Sidsel Villumsen, Department of Development and Planning

Stig Kjær Andersen, Department of Health Science and Technology

Søren Vingtoft, Department of Development and Planning

Vivi Thuy Nguyen, Department of Mechanical and Manufacturing Engineering
ORGANISATION
DaCHI is managed by an executive committee supported by a reference group.

The DaCHI secretariat is hosted by the Department of Development and Planning and is managed by the director of the centre, Professor Christian Nøhr.

THE EXECUTIVE COMMITTEE
The executive committee consists of a representative from each participating department.

The representatives are together with the director responsible for the management of the centre.

The executive committee appoints a chairman and determines the rules of procedure.

The following research fields are represented in the executive committee:

- Research Group for Technoantropology and Participation, Department of Development and Planning represented by Pernille Bertelsen and Christian Nøhr
- Research Group for Information Practice Studies, Department of Communication and Psychology represented by Ann Bygholm and Anna Marie Kanstrup

REFERENCE GROUP
DaCHI has established a reference group to ensure and actively support DaCHI’s missions and fundings to match the ideas, requests and demands of a professional approach to health informatics in accordance to expectations from the public as well as private sector.

The reference group members shall contribute with mutual inspiration to each other and to DaCHI.

The reference group meet 1-2 times a year. At these meetings DaCHI presents results achieved and current projects and important subjects within health informatics are discussed.

The reference group is represented by:

- The North Denmark Region by Claus Wegener Kofoed
- The Central Denmark Region by Mogens Engsig-Karup
- Aalborg University, Department of Communication and Psychology by Ann Bygholm
- Aalborg University, Department of Development and Planning by Christian Nøhr
- Aalborg University, Department of Health Science and Technology by Stig Kjær Andersen
- Aalborg University, Department of Business and Management by Lars Ehlers
- Aarhus University by Kristjør Skajaa
- Aalborg University Hospital by Karin Hedegaard
- Centre for Health Telematics by Ib Johansen
- CHI – Vendor Forum (CHI-Leverandørforum) by Jan Mark (CSC)
- The Danish Institute for Health Services Research by Helle Wentzer
SECRETARIAT
The secretariat’s staff:

- Lene Sømød Flou
  Academic Secretary
- Marianne Sørensen
  Academic Officer
- Anni Møller Brændstrup
  Senior Clerk
- Christian Nøhr
  Director of Centre
The researchers in DaCHI deliver research based teaching mainly in four programmes:

**CLINICAL SCIENCE AND TECHNOLOGY**

The Clinical Science and Technology MSC is directed to employees in the health care sector who aim to operate high technology devices and equipment at work.

The education focuses on analyses, evaluation and development of clinical practise within health care innovatively and well documented.

A Master’s degree of Clinical Science and Technology ensures competences to improve the usability of technology within the various health specializations. Furthermore, the ability of critically address this usability considering patient care and the existing documentation.

**MASTER IN BIOMEDICAL ENGINEERING AND INFORMATICS**

Biomedical Engineering at Aalborg University is an interdisciplinary program with focus on electrophysiology and human sensory motor physiology. Potential candidates are students with a B.Sc. in biomedical engineering, electrical engineering or an equivalent degree within information technology.

High level courses within medical technology, neurophysiology, signal processing, scientific communication, rehabilitation technology, etc. are offered. Large projects carried out in groups of students are a substantial part of the programme, where students design and implement solutions to real life problems.

**MASTER IN HEALTH INFORMATICS**

The master in Health Informatics is a part-time, continuing adult education for people with a health care background. The program focuses on planning, development and implementation of health care systems. The students obtain competencies in organizing work flow when implementing health care systems, and to evaluate the possibilities and limitations in the use of health informatics and technology in health care.

**MASTER IN TECHNO ANTHROPOLOGY**

The Master’s programme in Techno-Anthropology combines competence in carrying out anthropological studies of techno-science cultures with technological insight. The students deal with collaboration between technical experts in different settings and other stakeholder groups such as consultancy firms, R&D departments at multinational companies, advisory bodies, international organisations, public institutions, think tanks, NGOs, or universities. The students work theoretically and empirically on how such collaborations can be turned into sustainable technological innovation and responsible decision-making regarding new technologies. The students use anthropological theory and methods to study how technology is used, and how it influences users.

**STUDY BOARD OF MEDICINE AND HEALTH**

Pia Elberg is chairman of the Study Board and Louise Pape-Haugaard is member of the study board.

**STUDY BOARD OF TECHNO-ANTHROPOLOGY**

Pernille Bertelsen is member of the study board.
In 2015 the following conferences and seminars were organised by researchers in the network and administered and coordinated by the DaCHI secretariat.

**E-HEALTH OBSERVATORY - CONFERENCE 2015**

The theme for this annual conference “how to develop a citizens eHealth system that strengthens the cohesion between the municipalities healthcare service close to home and the future hospital structure” was addressed by 9 keynote presenters and discussed in 52 oral presentations in the parallel sessions.

Exciting international experiences and vision from Australia, Norway and Sweden was delivered by international keynote speakers such as professor Enrico Coiera, Maquarie University, Sydney, associate professor Paul Turner, University of Tasmania, Hobart, and the director of eHealth and Medication Safety, Neville Board, Lina Nilsson from the Blekinge Institute of Technology and Irene Olaussen from the Norwegian Directorate of eHealth.

Among the abstracts submitted 36 were selected for oral presentations in the 12 parallel sessions and represented Danish experiences and visions. A novelty this year was a scavenger hunt that created extra excitement and activity at the well-attended exhibition.

You can find slides and photos from the conference on: www.e-sundhedsobservatoriet.dk.

Christian Nørh, Pernille Bertelsen, Stig Kjær Andersen and Søren Vingtoft organized the conference.
EXTRACTING HEALTH DATA FOR MULTIPLE PURPOSES – HOW CAN THIS ADD VALUE IN HEALTH CARE?

The auditorium was packed with interested and active participants when Umberto Tachinardi and Eneida Mendonca fra University of Wisconsin, Madison, USA on the 2 June opened the conference with keynote presentations about their experiences with the reorganization of the data infrastructure at their hospital. A reorganization with focus on secondary use of data in the health records which added value in both clinic, research and administration. Inspiration from ongoing Danish initiatives and networking constituted the afternoon program.

The conference was organized by Pia Elberg, Christian Nøhr and Søren Vingtoft

WORKSHOP OF SUSTAINABLE AND VIABLE IMPLEMENTATION OF TELE-TECHNOLOGY IN HEALTH CARE

The project of sustainable and viable implementation of tele-technology in health care arranged a workshop where the project results were announced followed by an open discussion on how the North Jutland suppliers, developers and researchers can take steps towards interdisciplinary tele-technological co-operation, where user involvement is in focus. 50 people attended the workshop held on August 27, with the outcome of efforts to establish a telemedicine network in North Jutland.

The conference was organized by Lars Botin, Christian Nøhr and Pernille Bertelsen
In 2015 researchers within DaCHI were involved in either Scientific Programme Committee (SPC), Editorial Committee (EC) or Local Organizing Committee (LOC) in the following conferences and seminars.

**CONTEXT SENSITIVE HEALTH INFORMATICS**

This pre-medinfo conference was held in Curitiba, Brazil from August 15-16 2015. The theme of the conference is Health Informatics: Many Places, Many Users, Many Contexts, Many Uses. Internationally, health information technology (HIT) is changing the healthcare landscape. Over that last few decades, we have seen a rapid growth in the number of innovations implemented worldwide. These innovations have been influenced by differing health care problems, systems of delivering health care and international contexts. While individual countries have made advances in developing innovative HIT in response to local contexts and healthcare needs, these innovative advances have not always been exported to other countries to enable adaption to other systems of care. Therefore it is essential that we learn from each other and use our collective experiences to support the design of innovative new HIT.

Christian Nøhr was member of the SPC

**MIE 2015**

The European Medical Informatics conference choose the theme Digital healthcare empowering Europeans for the conference held in Madrid, Spain from 27-29 May.

The MIE2015 program contained presentations of papers, posters, workshops, panels, and special events, as well as interactive demonstrations related to the topics that addressed a range of important aspects, relating to opportunities for or impact of new approaches and IT tools in day-to-day life affecting the citizens. The conference theme aligned with collective efforts of multiple parties; Patients, care providers, system developers, researcher and ultimately the entire population of Europe to join in to enjoy benefits from the potentialities in digitization of health information.

Stig Kjær Andersen and Louise Pape-Haugaard were member of the SPC and Stig Kjær Andersen also in the EC
**PDC 2016 – PARTICIPATORY DESIGN CONFERENCE**

Is held in Aarhus, Denmark, August 15 – August 19. The theme of the conference is Participatory Design in an Era of Participation – living in an era of participation prompts critical questions around the goals and practices of involving people in diverse aspects of developing, redesigning and using IT. PDC brings together a multidisciplinary and international group of researchers and practitioners from multiple fields encompassing a wide range of issues that emerge around cooperative design.

SPC Chair: Anne Marie Kanstrup, Department of Communication and Psychology

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**SCANDINAVIAN CONFERENCE ON HEALTH INFORMATICS (SHI2015)**

Was held on 15-16 June in Tromsø, Norway with the aim to exchange experience, cooperate and network within the field of development, implementation, use and assessment of informatics in the health sector in Scandinavia. Three key-notes, panel and workshop sessions, and oral presentations within these themes among others: electronic communication, monitoring, games for health and interoperability and clinical decision support were on the program of the conference.

Members of the SPC; Ann Bygholm, Department of Communication and Psychology, and Ole Hejlesen from the Department of Health Science and Technology
Paul Turner was visiting Aalborg University on his sabbatical from University of Tasmania, and he presented some of his research on human centred design of health information systems at a meeting organized by DaCHI and the programs in Interaction Design and Techno Anthropology. DaCHI has a number of collaborative research projects with Paul Turner and his team in Tasmania, and his visit to Aalborg University and DaCHI contributed to extend this collaboration to also include student exchange in health informatics.

Craig Kuziemsky participated on the faculty of a PhD course on “Participatory methods in health informatics” held at Aalborg University, May 21 and 22. Craig Kuziemsky presented his recent research on how to involve health care professionals, IT-users, patients and relatives in change processes. Craig Kuziemsky is Associate Professor at Telfer School of Management, University of Ottawa, Canada and Director of the MSc in Health Systems Program.
DACHI INTERNATIONAL RESEARCH VISITS

PROFESSOR MSO ANNE MARIE KANSTRUP
was Visiting Professor at the Living Environments Laboratory at Wisconsin Institute for Discovery, University of Wisconsin-Madison, USA

PROFESSOR CHRISTIAN NØHR
visited The Australian Institute for Health Innovation at Macquarie University in Sydney. He gave a seminar on Monitoring Use of eHealth on a National Level. (For a description see: https://aihi.mq.edu.au/event/seminar-professor-christian-nørh-monitoring-use-ehealth-national-level

Professor Christian Nørh also spent some time at the School of Health Information Science at University of Tasmania where he presented the organization of DaCHI to inspire the initiation of a similar Tasmanian centre for health informatics. He also participated in sessions with PhD students.
PARTICIPATORY METHODS IN HEALTH INFORMATICS

Involvement of health care professionals, IT-users, patients and relatives in change processes has been on the agenda for years. Participatory methods for design, evaluation and implementation of health informatics is a diverse collection of principles and practices aimed at making IT systems and health care institutions more responsive to user needs. A central principle of participatory methods is the direct involvement of the intended actors and/or beneficiaries in the activities of design, evaluation and implementation of health informatics systems. The objective of the course was to introduce and discuss important theories and methodological approaches to participation in health informatics. The students also took part in practical exercises to train methods and principles for participatory design - evaluation, and - implementation.

A number of international scholars presented their experience from specific participatory design projects. Furthermore the participating PhD students presented their studies and got feedback from a panel consisting of Craig Kuziemsky, associate professor at the Telfer School of Management at University of Ottawa, Canada and Lars Kayser, associate professor at the Department of Public Health at the University of Copenhagen.

Organizers: Christian Nøhr and Pernille Bertelsen
DaCHI is secretariat for various networks and associations.

**CHI VENDOR FORUM (LEVERANDØRFORUM)**
The CHI Vendor Forum consists of a group of seven companies delivering IT systems to the health care sector. They have had three meetings in the period of reporting. The activities have been in various taskforce groups and special topic meetings with Mette Høyrup and Deike Driseberg from National Health IT, Hans Erik Henriksen from Health Care Denmark and Claus Balslev from the Capital Region of Denmark.

Responsible for this forum are: Pia Elberg and Marianne Sørensen.

More information: www.leverandoerforum.dk

**RESEARCHER FORUM FOR EHEALTH (FORSKERFORUM FOR SUNDHEDS-IT)**
eHealth Researcher Forum was established in the autumn 2011. The participants of the forum are all active in research in health informatics i.e.: Copenhagen University, Technical University of Denmark, Roskilde University, Aarhus University, IT University of Copenhagen, Aalborg University and the public sector research institution KORA. The activities in this forum are primarily organizing and running PhD courses, exchange of experiences of planning and running research projects. More information: sundheds-it-forskerforum.dk

The eHealth Research Forum was instrumental in organizing a guest lecture with Professor Enrico Coiera from Centre for Health Informatics at Macquarie University, Sydney. The guest lecture was held at Department of Computer Science at Copenhagen University October 8th.
RECONSI
An international research collaboration has been established in the autumn of 2013: ReConSI Research Consortium on Semantic Interoperability for health. The aim of this consortium is to perform internationally recognized common research on semantic interoperability for health. As parts of medical informatics groups in three universities in Denmark (Aalborg University), Sweden (Linköping University) and The Netherlands (Amsterdam University), we join forces in a consortium. Our common research interests are:

• Semantic data quality
• Medical Knowledge Representation
• Semantic Interoperability
• Information Modelling
• Medical terminologies
• Clinical content harmonization
• SNOMED CT
• Terminology-based data capture and use
• Information Modelling vs. Terminology Binding
• Application and use
• Mapping between SNOMED CT and classifications.

The consortium intends to collaborate on delivery of scientific contributions within the scope of our shared research interest, and to disseminate knowledge on semantic interoperability and its application. The collaboration between the consortium members consists of:

Sharing knowledge within:
• topics of research
• research environments
• teaching of medical informatics
• Facilitating exchange visits of MSc and PhD students as well as staff
• Defining and applying for research projects on shared interests
• Publishing collaboratively
• Reaching out to the larger community through special actions and publications

The members are solidified by a signed agreement. A program for visits with seminars, Virtual meetings, Brainstorms for joint application is settled. Participants: Stig Kjær Andersen, Pia Elberg, Kirstine Rosenbeck Gaeg, Anne Randorff Højen

ASSOCIATIONS
• EFMI the European Federation for Medical Informatics, EFMI, Stig Kjær Andersen is executive officer of this cooperation
• IMIA the International Medical Informatics Association, IMIA. Aalborg University is represented by Christian Nøhr, Stig Kjær Andersen, being an Institutional Member
• AMIA the American Medical Informatics Association has Stig Kjær Andersen, Christian Nøhr, and André Kushniruk as members

WORKING GROUPS
• eHealth in Africa, Platform for Human Health under Building Stronger Universities represented by Pernille Bertelsen
• Implementation & Education Committee represented by Anne Randorff Højen
• IMIA Working group on human factors engineering and usability in health informatics. Chairman of the group is Christian Nahr and André Kushniruk is co-chairman
• NeRN Nordic eHealth Research Network where Christian Nehr and Sidsel Villumsen are the respresented
PROFESSOR CHRISTIAN NØHR
was appointed Adjunct Professor at the School of Health Information Science at University of Victoria, BC, Canada

PROFESSOR CHRISTIAN NØHR
was appointed Fellow of American College of Medical Informatics

ASSOCIATE PROFESSOR STIG KJÆR ANDERSEN
was elected EFMI Honorary Member

PH.D. STUDENT SIDSEl VILLUMSEN
was awarded with the best student paper at the CSHI conference 2015 in Bresil
A n extract of some of the projects in health informatics by some of the researchers. A list of all the projects of each researcher can be found at VBN – Videnbase Nord (Knowledge Base North) www.vbn.aau.dk having the status of projects in progress 2015.

**AMBULANCE PROJECT**

Project “Video-stream ambulances to clinic” started in November 2014. The project was a continuation of the project “Use of video conference facilities in ambulances”, which included the Neurological ward at Aalborg hospital in Denmark. The continued project also included the pediatrics ward at Aalborg hospital.

The objective was the same as in the first project, which was to evaluate: a) the users (the clinicians and the paramedics) assessment of the clinical value of the video conference-facility, b) the possibility of improving the visitation of patients when using the facility, and finally c) the potentials for a wider application of the facility.

During the evaluation, the video-facility was used between ten ambulances mainly situated at Falck Ambulance Stations in the remote areas in The North Denmark Region and the neurological- and the pediatrics wards at Aalborg hospital, Denmark.

**Funding:**
The North Denmark Region

**Participant:**
Anna Marie Høstgaard
ASSESS CT – HORIZON 2020

ASSESS CT will contribute to better semantic interoperability of eHealth services in Europe, in order to optimise care and to minimise harm in delivery of care. The ASSESS CT project, integrating a broad range of stakeholders, will investigate the fitness of the international clinical terminology SNOMED CT as a potential standard for EU-wide eHealth deployments. In a joint effort, the ASSESS CT consortium will

- address this challenge by investigating a number of issues related to the current use of SNOMED CT such as concrete reasons for adoption/non adoption of SNOMED CT, lessons learned, success factors, type and purpose of use, multilingualism, cultural differences, strengths and weaknesses
- review – using literature review, survey, interviews, focus groups and workshops - the current state of use of SNOMED CT and the fulfillment of semantic interoperability use cases, known technical and organisational drawbacks, and the way the terminology is improved and maintained.

- employ established evaluation approaches from social science. It will scrutinise adoption against two alternative scenarios: to abstain from actions at the EU level, or to devise an EU-wide semantic interoperability framework alternative without SNOMED CT.
- analyse the impact of SNOMED CT adoption from a socio-economic viewpoint, encompassing management, business, organisational, and governance aspects.

Validation of all working tasks, both political and domain-specific, will be secured through four large workshops with a list of distinguished experts assembled in an Expert Panel, Committee of MS Representatives, and national focus groups.

Funding:
EU

Participants:
Anne Randorff Højen, Kirstine Rosenbeck Gøeg

CLINICAL HANOVER

This project aims to conduct an exploratory research on the work practices of shift-to-shift medical and nursing handover in five countries – Australia, Denmark, Norway, United States and Brazil, utilizing video observation methods, with a view to eventually developing a system to support clinical handover practices. The project aims to define shift-to-shift clinical handover practices across different countries and healthcare services. It further aims to develop a common understanding of the clinical handover process and explore the work practices in clinical handover in these countries. This project then aims to develop systems to improve clinical handover practices utilizing a user-centered approach.

This project will be the first of its kind to explore and define clinical handover practices across different countries from the views of clinicians. This will help better define the process and develop an improved understanding of potential initiatives that could improve clinical handover.

Participants:
Christian Nøhr. Project partner is University of Tasmania with Paul Turner and Ming Chao Wong.
CONCEPTS, VALUES AND METHODS FOR ILLUMINATING SUSTAINABLE AND VIABLE DEVELOPMENT AND IMPLEMENTATION OF TELE-TECHNOLOGY IN HEALTH CARE

The project theme is tele-technology solutions in health care and various methodological possibilities for sustainable and viable implementation of tele-technology in health care. A conceptual clarification is essential, in relation to the various tele-technologies, because this is necessary for meaningful communication and action in the future development and implementation of tele-technology in health care.

Founding:
The North Denmark Region and European Social Fund

Participants:
Aalborg University Hospital Science and Innovation Centre and from the Department of Development and Planning Lars Botin, Pernille Bertelsen and Christian Nøhr

CONSENSUS ON EHEALTH DEFINITIONS

There is a significant degree of attention and focus on ehealth initiatives globally; ehealth frequently forms a component of healthcare strategy and policy, and is represented in projects, financial outlays, cost benefit, outcomes, clinical process improvement, safety and quality, and addressing the challenges facing healthcare. Activities, which are described as implementing ehealth solutions, attract significant funding, and consume many resources and much time.

However, despite the frequency with which the term is used, there does not appear to be a general consensus about the meaning of ‘eHealth’. While there appears to be near-unanimous support for eHealth and its benefits, there is much less agreement about what eHealth actually represents.

Many definitions have been proposed, but there has so far not been any universal agreement about what things might be excluded or included within the scope of the term.

This project explores the possibilities of reaching an international consensus on the use of the term eHealth in order to avoid misunderstandings in the professional discourse, and to clarify the potential and scope of eHealth applications.

Participants:
Christian Nøhr. Project partner is University of Tasmania with Chris Showell.
E-HEALTH OBSERVATION
This project aims to identify and analyze the Danish development of eHealth in both hospitals and primary care. Emphasized is uncovering the dissemination rate of the Electronic Health Records (EHR), detecting EHR stakeholder experience, identifying and evaluating key factors that promote the extension and use of EHR, as well as identifying and evaluating general barriers to the EHR. Furthermore, the project aims at communicating the experiences achieved among the primary actors. This is accomplished by an annual conference that brings together the most active partners within health informatics throughout the country.

Project homepage:
e-sundhedsobservatoriet.dk

Participants:
Christian Nøhr, Pernille Bertelsen, Stig Kjær Andersen, Søren Vingtoft.

EAST: ENGAGEMENT IN HEALTH AND SOCIAL TECHNOLOGIES
Engagement in health care and social technologies.
The EAST-project examines how social technologies can increase involvement in health. The project is carried out in cooperation with the citizens in a health high-risk area.

The EAST-project contributes with knowledge about:
1) User driven innovation in general and specifically how the citizens of a residential area can be involved as co-designers in technology development
2) Design concepts that make sense in a health high-risk area and thereby also knowledge of effective concepts against inequalities in health care.

Participants:
Anne Marie Kanstrup, Pernille Bertelsen, Jacob Østergaard Madsen
EVALUATION OF RFID PILOT PROJECT

About 1 bn DKR on the Danish health budget goes to treatment of patients with nosocomial infection. The infection can be transmitted by direct contact, droplets, blood and particles among others. To reduce the danger of infection there is special attention on hygiene in Danish hospitals and several guidelines describe how these hygiene requirements should be followed. (source: Generelle smitteforebyggende forholdsregler-pri). In order to further comply with the cleaning instructions it would be an advantage to have information about the precise time of cleaning and the type of cleaning done. Thereby knowing if the bed is sufficiently clean to be used again without danger of infection for the next patient in proportion to the abovementioned causes of infection.

It is also essential to know the location of the bed to avoid using many resources finding it.

To examine a potential tagging-solution to the above problem a pilotproject was carried out in the autumn 2014.

A research group at Aalborg University was invited to participate in the final evaluation of the project but it turned out that the design of the pilotproject wasn’t adequate to provide an answer as to whether tagging of beds is a good solution and the result was not published.

Participants:
Louise Bilenberg Pape-Haugaard og Karsten Ulrik Niss

LABX

The aim of this project is to strengthen implementation of health and welfare technology through improvement and enhancement of cooperation between public and private institutions. The project revolves around a number of living labs focusing on innovation and refinement of technologies and within a period of two years a series of technologies (intelligent beds, alarms, dispensers, etc.) will be explored (in nursing homes and elderly homes primarily). The project is a co-operation between University College Northern Denmark, The Social and Health College in North Jutland and Aalborg University.

Participants:
Ann Bygholm, Anne Marie Kanstrup, Søren Bolvig
**MAPPING SURGICAL SUPPORT WORK**

This project outlines the complexity of knowledge work in surgical wards with high demands for safety, division of labor, efficiency and ethics. The project shows how the operation team distributes and coordinates work at the up-ward and the up-section, and in relation to the specific continuity of care and the overall program of the day. The mapping also identifies crosspressures between the demands of the technological development to the specialties, to the teamwork and to the competences of the surgical support work. The cases are completed as close-up studies of interaction and co-operation at four surgical wards, including materials, technics, ways of communicating and IT tools being a part of generating flow and safety at the ward, and comfort among the team. The project is carried out for The Capital Region of Denmark.

**Participant:**
Helle Wenzter

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**MULTIPLEX BCT**

The project aims to develop a diagnostic test that will rapidly provide Gram classification and, in parallel, identify the most prevalent infectious organisms in positive blood cultures in order to enable the selection of the most appropriate antibiotic treatment for the patient. Combining the Gram and ID tests in one device enables optimized therapy selection at the earliest possible time. The test comprises a molded cartridge and pre-loaded assay reagents. The project also includes the development of a tablet-based reporting module that will facilitate the entry of patient data and test results and communicate the results to the hospital information system and directly to the treating physicians further reducing time lags in action being taken on the test results. The test and tablet software will be prototyped and tested in pre-clinical studies. The successful design and software will be transferred to manufacturing operations. The test will be validated in a clinical study conducted at Aalborg University Hospital.

The study is expected to form the basis for a CE-IVD certification of the test. An outcome study will be designed and conducted, also at Aalborg University Hospital, in which patient outcome and associated hospital expenses obtained with the use of the new test will be compared with those obtained with current methods. It is expected that the results of the validation and outcome studies will be described in separate manuscripts that will be submitted for publication by peer-reviewed clinical microbiology journals.

**Participants:**
Louise Pape-Haugaard, Ole Hejlesen
NATIONAL MONITORING OF DEVELOPMENT AND USE OF E-HEALTH IN DENMARK

Earlier we have experienced several research projects making status of penetration of eHealth systems. They have primarily been focused on EHR systems and mostly on whether they have been implemented or not. However, the penetration has now reached a level making it more interesting to survey whether the systems are used and if so – to what extension and where in the daily clinical work practice.

This is a continual project making a survey every year questioning around 8000 clinicians about their use of e-health systems. The aim of the survey is to clarify the use of and the attitudes to e-health. This survey is the third in a row, addressing randomly selected physicians, nurses and medical secretaries. The survey is made in cooperation with “Lægeforeningen”, “Dansk Sygeplejeråd” and “Dansk Lægesekretærforening”.

In the long term the objective is to compare the results over several years, making tendencies of use and attitudes to e-health systems visible. Further, the results will make a comparison to other countries possible.

The survey is a part of the Nordic e-Health Research Network (NeRN) making equivalent surveys in the Nordic countries. Further, the project is a part of the OECD task force on model survey on the availability and use of information and communication technologies in the health sector.

Participants:
Christian Nørh, Søren Vingtoft and Sidsel Villumsen
PATIENT SAFETY
There is evidence that health information technology (HIT) is central to improving safety and quality of health service. But research has also documented the ability of health information systems to introduce new types of errors (i.e. technology-induced errors) that arise from the design and development, the implementation and customization, or the interactions between the operation of a technology and the new work processes that arise from a technology’s use.

Within this theme we are engaged in a number of project activities:
Co-chairing the launch of a new working group on patient safety informatics within the International Medical Informatics Association (IMIA)

• Critically review of initiatives that address safe HIT system design, build, implementation and use in a non-exhaustive set of exemplar countries identified by searching the websites of regional and national agencies and programs in England, Denmark, the Netherlands, the USA, Canada and Australia. 20

• Analysis of reports on adverse drug events in the Oncology Department at Aalborg University Hospital in relation to a newly implemented medication administration system (ONCMED).

Participants:
Christian Nøhr and André Kushniruk.

PRESENTATION OF DIAGNOSTIC DELAYS
The project presents and contextualizes an international study of literature of human factors in diagnosis delays of diagnosis processors in Danish correlation. The presentation is performed as a lecture at the Medical Clinic for Immigrant, Odense University Hospital, as a course for physicians, Bella Center 2013, lectures at the Research Unit Early Cancer Diagnosis, Aarhus University and at the postgraduate education for all physicians at Aalborg University Hospital 2014. The presentation and publication are conducted in cooperation with Common Medicine, Aarhus University and the Copenhagen University Hospital. The project is financed by TrygFonden.

Founding:
TrygFonden

Participant:
Helle Wenzter
**PSYCHOLOGIST SUPPORTED INTERNET PSYCHIATRIC TREATMENT OF MILD TO MODERATE DEPRESSION**

Region Southern Denmark has through a three-year project period developed and tested a prototype for Internet assisted treatment of patients with mild to moderate depression. The treatment includes a computer-based program with texts, films, exercises and questionnaires, supplemented with written support and video dialog with a psychologist. The overall objective was to test the use of cognitive behavioral therapy on the internet.

The conclusions of the report Region Southern Denmark has succeeded in developing an academic environment and the "Telemedicinsk Center" has established a research and innovation environment being able to focus on working with data collection and study of the effect.

In the long run, it is expected to achieve socio-economic benefits of the internet treatment over the conventional treatment of patients with a depression. Patients are not to spend time and costs on transportation. The health care costs of the internet treatment are assessed, however - from a ceteris paribus approach - to be higher than the current treatment of talk therapy by psychologists in private practice under the subsidy scheme.

According to a questionnaire the patients are satisfied with the treatment. However, the effect of the effort has not been investigated in this project, and there is a need that the patient recruitment will be cemented through implementation. The results from foreign studies show that it is too early to conclude on the effect of Internet assisted psychiatric treatment with cognitive behavioral therapy of patients with depression.

**Funding:**
Region of Southern Denmark and the Foundation for Social Technology

**Participant:**
Helle Wentzer

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**PULSUP**

The project is an intervention project exploring design of exercise networks for young adults diagnosed with depression, anxiety and low physical activity. The project is a cooperation with the General Practice Sløjfen, Aalborg Municipality’s health shop, and The Research unit for medical practice in Aalborg.

**Funding:**
TrygFonden

**Participants:**
Anne Marie Kanstrup and Pernille Bertelsen
STANDARDISATION OF DANISH HOME-CARE NURSING TERMINOLOGY (FÆLLES SPROG III)

In 2013 Local Government Denmark (KL) decided that any registration of home-care nursing interventions must be linked to specific problems registered by the nurse. Furthermore, KL decided that registration of core information in home-care, if possible, should be registered using international classifications and terminologies. These decisions led to initiation of collaboration with TaMiCS on developing SNOMED CT subsets for nursing problems and care procedures and also for registrations of a citizens level of functionality. The work is made in collaboration with groups of clinical experts and the methods used and resulting subsets was published during 2015. See also www.kl.dk/fs

Participants:
Pia Elberg, Anne Randorff Højen, Kirstine Rosenbeck Gøeg

TELECARE NORTH

TeleCare North is an ambitious, large-scale telemedicine project to all severe COPD patients in North Jutland (according to GOLD criteria). The anticipated social and human benefits from this investment have also secured widespread support for the project: from all North Jutland municipalities, the North Denmark Region as well as hospitals, general practitioners, a patient advocacy organization and Aalborg University.

A large-scale project like TeleCare North where all healthcare professionals in the system engage in interdisciplinary telemedicine collaboration – not only concerning the patient but also involving the patient – is the first of its kind in Europe and also explains why the project is being closely monitored in Denmark and abroad. Yet, the project is also challenging: Setting a goal of health equality and turning the patient from a passive recipient of services into an active team player makes big demands on everyone involved.

Unprecedented types of collaboration must be established, new support and service functions must be set up for patients and their families, work routines must be changed, patients must be brought into the process and they must provide their own data.

Members of the steering group:
Professor Lars Holger Ehlers, Department of Business and Management, and Ole K. Hejlesen, Professor at Department of Health Science and Technology
USABILITY TEST OF FIVE MEDICATION MANAGEMENT SYSTEMS

In Denmark the five regions have implemented different electronic health record (EHR) solutions developed by different vendors consequently resulting in different working procedures in each region. The systems have been tested according to functionalities, but have not been usability tested to the same depth and using the same methods to allow comparison. Ten physicians were therefore recruited to perform a usability test in a cross-over design, both testing their own system and an unknown system. This study focuses on the methodology to conduct a usability test in the five different systems focusing on the medication module.

Participants:
Christian Nøhr, Anne Marie Kanstrup, Inge Madsen, André Kushniruk

VIDEO CONSULTATIONS IN CROSS-SECTORIAL PATIENT CARE

The research project will determine which communication and which diagnostic cooperation is possible in virtual environments, where the doctor, patients / citizens and nurses communicate via video.

The doctor will not be able to examine his patient physically, but will be dependent on the patient / citizen and the nurse to show and explain the symptoms and findings. All three parties hereby have a new option using video consultation, but furthermore they have to face new communicative tasks.

KORA examine these communicative processes and their influence to the involvement of citizen / patient, clinical decision making and coherent patient care.

Funding:
Central Denmark Region, Municipality of “Syddjurs” and KORA

Participant:
Helle Wentzer
MONITORING AND EVALUATION OF AVAILABILITY AND UTILIZATION OF HEALTH-IT IN DENMARK
Many countries have national strategies for developing and implementing health Information Technology (health IT) systems, especially electronic patient records (EPR). Some countries follow up on these strategies by monitoring the availability and the use of health IT systems. In order to obtain insight in the progression, free of special interest and based on scientific methods, it is important that independent institutions perform the data collection and analysis. Further, it is important to apply suitable scientific methods in order to ensure reliable and valid data.

This PhD project aims to develop a scientific methodical basis for the Regions of Denmark to monitor and evaluate the availability and use of health information systems. The methods for monitoring and evaluation aims to deliver input for the further strategic work on national and regional level. Further, the project aims at founding an effect monitoring. The project is currently working on a meticulous and exhaustive literature review following acknowledged guidelines.

PhD project of Sidsel Villumsen, period: October 2014 to September 2017

METHODS FOR IMPLEMENTING HEALTH CARE TECHNOLOGIES IN LOCAL PRACTICE
The ph.d. project focus on examining the existing level of implementation of welfare technology solutions in Danish municipalities and on developing new implementation methods to the health care staff working in the local practice. The project is carried out in cooperation with University College North, Department for Senior Citizens and Disabled in the Municipality of Aalborg, the Center for Governmental Health Research in the Department of Health and Culture in the Municipality of Aalborg and Aalborg University.
Most important health IT related publications from the DaCHI researchers.

A full list of each researcher’s publications can be found at VBN: Viden-base Nord (Knowledge Base North) www.vbn.aau.dk having the status of publications 2015.


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