Suomen Telelääketieteen ja eHealth seura
Finnish Society of Telemedicine and eHealth

eHealth2024 International Conference

The 29th Finnish National Conference on Telemedicine and eHealth

"From Research to Impact on Digital Health and Welfare Services"

14.-15.11.2024

Tampere

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Esipuhe
XXIX Kansallinen ja kansainvälinen Telelääketieteen ja eHealth konferenssi

Outi Ahonen, puheenjohtaja
Suomen telelääketieteen ja eHealth seura ry

Arvoisat kutsuvieraat, hyvät konferenssipäiviin osallistujat.

Suomen telelääketieteen ja eHealth seuran puolesta minulla on ilo toivottaa teidät tervetulleeksi eHealth2024 konferenssiin ja samalla 29. vuotuiseen kansalliseen konferenssiimme Tampereelle, jonka teemana on ” From Research to Impact on Digital Health and Welfare Services”.

Seura on jo vuodesta 1995 edistänyt tieto- ja viestintätekniikan käyttöä terveydenhuollossa. Seuramme tärkein toimintamuoto on koulutustilaisuuksien järjestäminen ja kansalliseen keskusteluun osallistuminen. Seuramme julkaisee nyt kahdettatoista virallista vuosikertaa Finnish Journal of eHealth and eWelfare (FinJeHeW) -lehdestä yhdessä Sosiaali- ja terveydenhuollon tietojen käsittely-yhdistyksen (STTY) kanssa. Vuodesta 2004 alkaen olemme jakaneet vuosittaisen kansallisen eHealth- tunnustuspalkinnon ansiokkaasta toiminnasta telelääketieteen ja eHealthin alueella, joksi katsotaan esimerkiksi telelääketieteen ja/tai eHealth alaan kuuluva väitöskirja tai muu merkittävä seuran tavoitteiden mukainen toiminta kansallisella ja kansainvälisellä tasolla.

Tuemme myös ammatillista jatkokoulutusta vastaamalla osaltamme lääkäreiden, hammaslääkäreiden ja eläinlääkäreiden terveydenhuollon tietotekniikan erityispätevyysohjelmasta yhdessä Suomen lääkäriliiton ja Suomen hammaslääkäriliiton ja Suomen eläinlääkäriliiton kanssa. Konferenssista myönnetään 10 tuntia teoreettista koulutusta lääkäreiden, hammaslääkäreiden ja eläinlääkäreiden terveydenhuollon tietotekniikan erityispätevyyteen. Seura tukee stipendein suomalaisen eHealth osaamisen näkymistä kansainvälisesti.

Seuramme on perustajajäsen pohjoismaisessa Nordic Telehealth Association (NTA) järjestössä sekä toiseksi vanhin jäsen International Society for Telemedicine and eHealth (ISfTeH) järjestössä. Seuramme sihteeri Pirkko Kouri työskentelee IsfTeH:n johtoryhmän varapuheenjohtajana.

Vuoden 2024 konferenssissa käsitellään teemoja ja tuodaan uusinta tietoa kansainvälisestä ja kansallisesta digitaalisen sosiaali- ja terveydenhuollon kehityksestä ja ratkaisuista huomioiden myös tekoälyn tuomat näkökulmat. Kohtauspaikkana konferenssissa on tuoretta tietoa niin eri alojen lääkäreille, hoitotyön ja kuntoutuksen eri ammattiryhmille, sosiaalialan toimijoille sekä sosiaali- ja terveydenhuollon digitaalisten palveluiden kehittämisestä kiinnostuneille ammattiryhmille. Koulutus tuo uutta tietoa myös sosiaali- ja terveydenhuollon hallinnosta, suunnittelusta ja koulutuksesta vastaaville toimijoille. Konferenssi tarjoaa mahdollisuuden keskustella teknologisten ratkaisujen kehittämisestä, kuten tänä vuonna tamperelaisten toimijoiden rakentamassa/muodostamassa Gallery walk-ympäristöissä. Konferenssi sisältää englannin- ja suomenkielisen rinnakkaisohjelman. Lisäksi tutkijat ja kehittäjät esittelevät tiivistetysti tuloksiaan.

Suomen telelääketieteen ja eHealth seuran puolesta haluan kiittää kaikkia luennoitsijoitamme ja tieteellisten abstraktien esittäjiä korkeatasoista esityksistä. Samoin kiitän kaikkia näytteilleasettajiamme ja työpajojen järjestäjiä. Ilman teidän osallistumistanne konferenssimme ei olisi se oppimisen ja verkostoitumisen paikka, jona se nyt palvelee.

Erityinen kiitos konferenssistamme kuuluu pääyhteistyökumppaneillemme Tampereen yliopistolle, Tampereen ammattikorkeakoululle ja Pirkanmaan hyvinvointialueelle, jotka ovat vastanneet viestinnästä ja käytännön järjestelyistä sekä osallistuneet tieteelliseen toimikuntaan.

Toivon kaikille osanottajille antoisaa konferenssia.

Outi Ahonen

Foreword
The 29th Finnish National and International Conference on Telemedicine and eHealth

Outi Ahonen, President
Finnish Society of Telemedicine and eHealth, Finland

Distinguished invited guests, dear participants in the conference.

It is my great pleasure to warmly welcome all of you to our eHealth2024 and 29th annual conference to Tampere, of which the theme is "From Research to Impact on Digital Health and Welfare Services".

Finnish Society of Telemedicine and eHealth (FSTeH) have been promoting the use of information and communication technology in health care since 1995. Our most important activity is to arrange educational events and to participate in the national discussion. Our society also publishes the Journal of eHealth and eWelfare (FinJeHew) together with the Finnish Social and Health Informatics Association (FinnSHIA). Since 2004, we have delivered the annual Finnish eHealth award from the significant accomplishments in the field of telemedicine and eHealth. The required activity can be for example a doctoral thesis in this area or some other important activity in the national or international level supporting the society´s goals.

We are supporting further education and training of health professional in the eHealth sector by coordinating special competence for healthcare information technology to physicians, dentists, and veterinarians together with the Finnish Medical Association, the Finnish Dental Association and the Finnish Veterinary Association. Our conference will contribute 10 hours of theoretical training for Finnish physicians´, dentists´ and veterinarians´ special competence for healthcare information technology.

Our society supports the international visibility of Finnish eHealth expertise by scholarships. Our society is a founding member of Nordic Telehealth Association (NTA) and International Society for Telemedicine and eHealth (IsfTeH). Our society´s secretary Pirkko Kouri holds one of the IsfTeH´s board member seats as IsfTeH´s vice-president.

This year´s conference covers themes from updating the knowledge about international and national digital health trends and solutions considering also perspectives of AI. The conference a offers a unique meeting place and new information to physicians from versatile fields, nursing and different professional groups in welfare and rehabilitation sector interested in the development of digital health and welfare services. The conference also brings new knowledge to those responsible for the administration, planning and training of health and social care in people´s daily lives. The conference organizers' digital, learning environments, development and research presentations provide an opportunity to discuss the development of technological solutions and the activities of local digital clinics in Gallery Walk environment. Our conference includes a parallel program in English and Finnish tracks as well as joint plenaries. Our conference organizes sessions and exhibitions for researchers and developers to provide a compact presentation about their research, innovation and development (RDI) results.

On behalf of Finnish Society of Telemedicine and eHealth I would like to express my gratitude to all lecturers and scientific abstract presenters for their valuable contributions. Our sincere thanks belong also to all our exhibitors and demonstrators. Without your support, this conference could not be the networking event it is today.

Our special thanks belong to our fellow organizers, Tampere University, Tampere University of Applied Sciences and Pirkanmaa Wellbeing County. They have been responsible for communication, practical arrangements and taking part to the scientific committee.

I wish everybody a very successful conference.

Outi Ahonen

eHealth 2024 järjestelytoimikunnan puheenjohtajan tervehdys

Tuomas Koskela, apulaisprofessori
Tampereen Yliopisto

Hyvät konferenssin osanottajat,

Toivotan järjestelytoimikunnan puolesta teidät kaikki tervetulleiksi eHealth-konferenssiin Tampereelle kuulemaan uusista aloitteista, ideoista ja tutkimustuloksista digitaalisen terveydenhuoltoon liittyen. Tampere, Suomen kolmanneksi suurin kaupunki, toimii ensimmäistä kertaa kansainvälisen eHealth-konferenssin järjestäjänä.

Elämme murrosvaihetta ja digitalisaatio lisääntyy terveydenhuollossa vauhdilla. Uusia digitaalisia sovelluksia ja palveluita syntyy jatkuvasti. Lisäksi ChatGPT:n tapaisen generatiivisen tekoälyn mahdollisuudet terveydenhuollossa kiinnostavat. Hehkutuksen keskellä tarvitaan kuitenkin tutkittua tietoa siitä, millaiset digitaaliset palvelut tuovat todellista lisäarvoa ja vaikuttavuutta terveydenhuoltoon. Konferenssin teema ”Tutkimuksesta digitaalisten terveys- ja hyvinvointipalvelujen vaikutuksiin” keskittyy siihen, millaista näyttöä meillä on digitaalisen terveydenhuollon vaikutuksista.

Ohjelmassamme on laaja valikoima sähköisen terveydenhuollon aiheita. Pääsemme kuulemaan kutsuttuja asiantuntijaluennoitsijoita sekä tieteellisiä esityksiä, joiden aikana tutkijat, opettajat, kehittäjät ja terveydenhuollon ammattilaiset jakavat ajatuksiaan ja osaamistaan kanssamme. Ohjelma sisältää esityksiä tekoälystä, etäkonsultaatioista, kyberturvallisuudesta ja sääntelystä, digitaalisen terveydenhuollon osaamisesta, käyttöönotosta, vaikutuksista ja kustannusvaikutuksista, kliinisen päätöksenteon tukijärjestelmistä, datan saavutettavuudesta ja laadusta, sekä vaikutusten arviointikokemuksista.

Lisäksi voimme iloksemme toivottaa näytteilleasettajat tervetulleiksi konferenssiimme jakamaan tietoa uusista lanseerauksistaan, tuotteistaan ja palveluistaan.

Haluan kiittää kaikkia järjestelytoimikunnan ja muiden toimikuntien jäseniä ahkerasta työstä konferenssin eteen, unohtamatta tämän konferenssijulkaisun editoijia ja Tampereen yliopiston kongressitoimistolta saamaamme panosta. Ilman tätä monipuolista osaamista ja työpanosta konferenssi ei olisi toteutunut. Järjestelytoimikunnassa on jäseniä Tampereen yliopistosta, Tampereen ammattikorkeakoulusta, Suomen telelääketieteen ja eHealth seurasta sekä Pirkanmaan hyvinvointialueelta. Tämä konferenssi on näiden edustajien yhteistyön tulos.

Toivotan teille kaikille inspiroivaa, vuorovaikutteista ja antoisaa kahta päivää eHealth-konferenssissa Tampereella. Lämpimästi tervetuloa!

Tuomas Koskela

Yleislääketieteen apulaisprofessori, Tampereen yliopisto

Ylilääkäri, Pirkanmaan hyvinvointialue

Järjestelytoimikunnan puheenjohtaja

Welcome words from the chairperson of the eHealth2024 organizing committee

Tuomas Koskela, Associate Professor
Tampere University

Dear participants of the conference,

On behalf of the organizing committee, I am happy to welcome you all to the eHealth conference in Tampere to hear about new initiatives, ideas and research results around digital health care. For the first time, Tampere, the third largest city in Finland, will be organizing an international eHealth conference.

Digitalization is rapidly increasing in healthcare. New digital applications and services are constantly emerging. In addition, the possibilities of artificial intelligence applications, including large language models, in healthcare are attracting interest. There is, however, a need for objective information on what kind of digital services provide actual added value and impact on healthcare amidst the hype. The theme of the conference 'From Research to Impact on Digital Health and Welfare Services' focuses on what evidence we have on the impacts of digital healthcare.

In our program we have a wide range of eHealth topics. We will hear invited expert lecturers and scientific presentations as researchers, teachers, developers and health care professionals share their thoughts and expertise with us. The program will cover presentations on artificial intelligence, remote consultations, cyber security and regulations, competencies in digital health care, uptake and impact of digitalization, clinical decision support systems, eHealth economics, data access and data quality, evidence on the impacts of digital health care and experiences on the assessments.

In addition, we are happy to welcome exhibitors to our conference to share information on their new launches, offerings, and services.

I would like to thank all members of the organizing committee and other committees for their hard work for the conference not forgetting the editors of this conference proceedings and input we received from Tampere University Congress Office. Without this extensive work, the conference would not have happened. The organizing committee included members from Tampere University, Tampere University of Applied Sciences, the Finnish Society of Telemedicine and eHealth and the Wellbeing Services County of Pirkanmaa. This conference is a result of collaboration of these representatives.

I hope you all will have an inspiring, interactive and rewarding two days at the Tampere eHealth conference. You are warmly welcome!

Tuomas Koskela

Associate professor of General Practice, Tampere University

Chief Physician, The Wellbeing Services County of Pirkanmaa

Chairperson of the Organizing committee

Järjestäjät / Organizers

Suomen telelääketieteen ja eHealth seura ry

Suomen Telelääketieteen ja eHealth seura on tieteellinen seura, jonka tarkoituksena on informaatio- ja kommunikaatioteknologian kautta edistää väestön terveyttä ja terveydenhuollollisen asiantuntemuksen levittämistä. Tarkoituksensa toteuttamiseksi seura järjestää seminaareja, luento- ja esitelmätilaisuuksia, kursseja ja symposiumeja, kehittää toimivan sähköisen yhteydenpitojärjestelmän jäsenten välillä, harjoittaa julkaisutoimintaa, tukee alan tutkimustyötä, antaa lausuntoja telelääketieteen kysymyksissä sekä ylläpitää suhteita ulkomaisiin alan järjestöihin. Suomen Telelääketieteen ja eHealth seura on jäsenenä alan kansainvälisissä verkostoissa kuten International Society for Telemedicine and eHealth, Nordic Telemedicine Association ja European Connected Health Alliance.

Seuran jäseneksi voi hallitus hakemuksesta hyväksyä henkilöjäseniä sekä kannatus- ja yhteisöjäseniä, jotka toiminnallaan tahtovat edistää seuran tarkoitusta. Jäsenetuihin kuuluvat jäsenkirjeet, joissa tiedotetaan ajankohtaisista telelääketieteen koulutustapahtumista sekä hallituksen toiminnasta. Seuran jäsenille myönnetään alennus osanottomaksuista seuran järjestämiin tilaisuuksiin, sekä eräistä alan kirjallisuuden hankinnoista. Liittymällä jäseneksi Sinulle avautuu verkosto, jossa saat helposti kontaktin muihin asiasta kiinnostuneisiin henkilöihin.

Seura jakaa vuosittain eHealth -tunnustuspalkinnon alan ansioituneelle henkilölle.

SteHS HALLITUKSEN JÄSENET / FSTeH BOARD OF DIRECTORS 2024

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Finnish Society of Telemedicine and eHealth

Finnish Society of Telemedicine and eHealth is an important forerunner in the field of telemedicine and eHealth in Finland as well as internationally. The aims of the Finnish Society of Telemedicine and eHealth are to promote the health of the population through telecommunication and to disperse the expert knowledge within health care. To reach the aims the Society will arrange seminars, lectures and presentations, courses and symposia, develop a functioning electronic communication system between the members, exert publishing activities, supports research within the discipline, formulate statements in issues dealing with telemedicine and have contact with other telemedicine organisations. We have a close collaboration with other national and international organisations, health care service providers and users. The purpose of the society is to promote education and development in the field of telemedicine and eHealth. Finnish Society of Telemedicine and eHealth is member of international networks such as International Society for Telemedicine and eHealth, Nordic Telemedicine Association and European Connected Health Alliance.

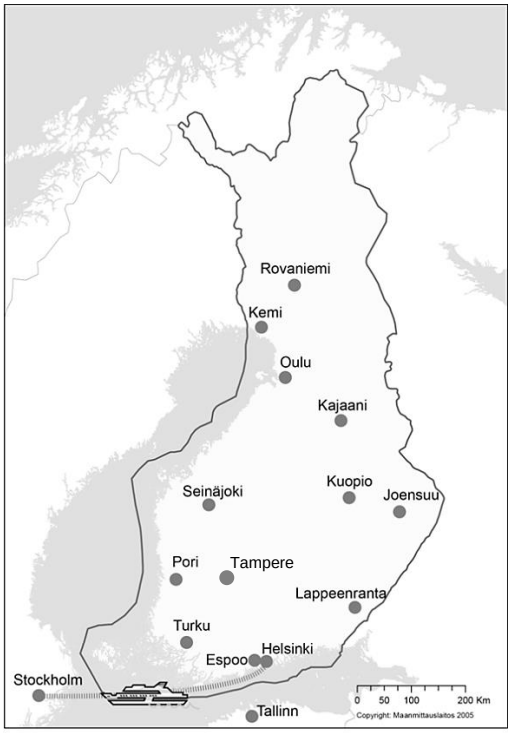
The board accepts the members based on application. Membership will be available for individuals or companies and organisations, as well as supporting membership. Foreign and overseas members do not pay an annual fee, if they submit a regular report of the progress of eHealth in their respective countries

Each year, the FSTeH delivers the Finnish National eHealth Award to a distinguished person in the field.

Internet: www.telemedicine.fi | Facebook: www.facebook.com/ehealthfinland | X: www.x.com/FSfTeHP

The main activity of the FSTeH is to organize annually the Finnish National Conference on Telemedicine and eHealth. The conference rotates between different cities and telemedicine sites to give local organizers the opportunity to promote their achievements

- 2024 – Tampere (International)
- 2023 – Vantaa (International)
- 2022 – Cruising Helsinki-Stockholm (International)
- 2021 – Oulu/hybrid (International)
- 2020 – Online (National)
- 2019 – Kuopio (International)
- 2018– Cruising Helsinki-Stockholm (International)
- 2017 – Turku
- 2016 – Cruising Helsinki-Stockholm (Nordic)
- 2015 – Espoo
- 2014 – Tallinn, Estonia (International)
- 2013 – Seinäjoki
- 2012 – Cruising Helsinki-Stockholm
- 2011 – Joensuu
- 2010 – Cruising Helsinki-Stockholm
- 2009 – Oulu
- 2008 – Cruising Helsinki-Stockholm
- 2007 – Kuopio
- 2006 – Helsinki, Nordic Congress of eHealth and Telemedicine, NceHT (International)
- 2006 – Cruising Helsinki-Stockholm
- 2005 – Lappeenranta
- 2004 – Kemi
- 2003 – Cruising Helsinki-Stockholm
- 2002 – Seinäjoki
- 2001 – Rovaniemi
- 2000 – Turku
- 1999 – Kajaani
- 1998 – Pori
- 1997 – Oulu
- 1996 – Kuopio (International)
- 1995 – Turku



Tampereen Yliopisto

Tampereen yliopisto on yksi Suomen monialaisimmista yliopistoista, johon kuuluu seitsemän tiedekuntaa: Informaatioteknologian ja viestinnän tiedekunta, johtamisen ja talouden tiedekunta, kasvatustieteiden ja kulttuurin tiedekunta, lääketieteen ja terveysteknologian tiedekunta, rakennetun ympäristön tiedekunta, tekniikan ja luonnontieteiden tiedekunta sekä yhteiskuntatieteiden tiedekunta. Tampereen yliopisto syntyi vuonna 2019, kun Tampereen teknillinen yliopisto ja Tampereen yliopisto yhdistyivät uudeksi säätiöyliopistoksi. Tampereen yliopistossa on noin 22 500 opiskelijaa sekä noin 4 200 työntekijää 80 eri maasta. [1]

Lääketieteen ja terveysteknologian tiedekunta (MET), joka on myös vahvasti läsnä tässä konferenssissa järjestäjien ja osallistujien kautta, keskittyy edistyneeseen tutkimukseen ja korkealaatuiseen koulutukseen biolääketieteen tekniikan, bioteknologian, lääketieteen sekä terveysteknologian aloilla. MET-tiedekunta tekee tiivistä yhteistyötä eri tiedekuntien kanssa, mutta myös muiden tutkimuslaitosten, terveyden- ja sosiaalihuollon tarjoajien sekä teollisuuden kanssa niin kansallisella kuin kansainväliselläkin tasolla.

Tutkimus MET-tiedekunnassa

Tekniikan, terveyden ja yhteiskunnan yhdistäminen on vahva osa Tampereen yliopiston strategiaa. MET-tiedekunnassa yhdistyvät lääketiede, biotieteet sekä tekniikan osaaminen lääketieteen terveyden ja hyvinvoinnin edistämiseksi. Tiedekunnassa on lähes 100 tutkimusryhmää, jotka jakautuvat 7 yksikköön. Lisäksi tiedekunnassa toimii kaksi Suomen Akatemian valitsemaa huippuyksikköä:

- The Center of Excellence in Body-on-Chip Research
- The Center of Excellence in Tumor Genetics Research

and six research centers:

- Celiac Disease Research Center
- Finnish Cardiovascular Research Center Tampere
- Prostate Cancer Research Center
- Science Mimicking Life
- Tampere Center for Child, Adolescent and Maternal Health Research
- Research Center for Vaccine Development and Immunology – VACCIM. [2]

Uutta koulutuksen saralla

MET-tiedekunta kouluttaa laaja-alaisia asiantuntijoita, jotta voimme vastata sekä lääketieteen että terveysteknologian tarpeisiin myös tulevaisuudessa. Koulutus perustuu tuoreimpaan, kansainväliseen tutkimustietoon, jotta koulutus pysyy ajan tasalla. Esimerkiksi, tieteen kehittyessä on yhä selkeämmin nähtävissä, että bioinformatiikan (esim. omiikka sekä high-throughput data) ja terveydenhuollon tietotekniikan alat (esim. anturitietojen, sähköisten potilaskertomusten ja rekisteritietojen käsittely) muodostavat yhden jatkumon. Näin ollen tulevaisuuden asiantuntijoilla on oltava ymmärrys molemmista aloista. Tämän tarpeen ratkaisemiseksi MET-tiedekunta tarjoaa uuden biolääketieteen informatiikan syventävän kokonaisuuden, jossa yhdistyvät bioteknologian maisteritutkinnon (FM) ja biolääketieteen tekniikan maisteritutkinnon (DI) vahvuudet.

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[1] Tampere University, Tuni.fi > About us > Tampere University, https://www.tuni.fi/en/about-us/tampere-university

[2] Faculty of Medicine and Health Technology, Tuni.fi > About us > Faculty of Medicine and Health Technology, https://www.tuni.fi/en/about-us/faculty-medicine-and-health-technology

Tampere University

Tampere University is one of the most multidisciplinary universities in Finland, including seven faculties: Faculty of Built Environment, Faculty of Education and Culture, Faculty of Engineering and Natural Sciences, Faculty of Information Technology and Communication Sciences, Faculty of Management and Business, Faculty of Medicine and Health Technology, and Faculty of Social Sciences. Tampere University was created in 2019, when the Tampere University of Technology and University of Tampere were merged. At Tampere University, there are approximately 22 500 students and 4 200 staff members from over 80 different countries. [1]

The Faculty of Medicine and Health Technology (MET), also present in this conference through organizers and participants, focuses on advanced research and high-quality education in the fields of biomedical engineering, biotechnology, medicine and health technology. The MET faculty works in close collaboration with other faculties and also with other research institutions, health- and social care providers and industry at national and international level.

Research at MET

Combining technology, health and society is a priority for Tampere University. The MET Faculty brings together medicine, biosciences and technology, to promote health and wellbeing. It has almost 100 research groups, spread within 7 units. In addition to this, the faculty is home to two Centers of Excellence, selected by the Academy of Finland:

- The Center of Excellence in Body-on-Chip Research
- The Center of Excellence in Tumor Genetics Research

and six research centers:

- Celiac Disease Research Center
- Finnish Cardiovascular Research Center Tampere
- Prostate Cancer Research Center
- Science Mimicking Life
- Tampere Center for Child, Adolescent and Maternal Health Research
- Research Center for Vaccine Development and Immunology – VACCIM. [2]

New in education

The MET faculty provides education to build expertise to meet the future demand for both medical and health technology professionals. The faculty keeps the education closely integrated with latest international research. For example, as science advances, there is the increased realization that the fields of bioinformatics (dealing e.g., with -omics and high-throughput data) and health informatics (e.g., dealing with sensor data, electronic health records, and registry data) form one continuum, and that researchers of the future need to have an understanding on both views. To address this need, the MET faculty is offering a new major, Biomedical Informatics, that combines strengths of the programs Master's degree in Biomedical Technology (MSc) and Master's degree in Biomedical Sciences and Engineering (MSc Tech).

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[1] Tampere University, Tuni.fi > About us > Tampere University, https://www.tuni.fi/en/about-us/tampere-university
[2] Faculty of Medicine and Health Technology, Tuni.fi > About us > Faculty of Medicine and Health Technology, https://www.tuni.fi/en/about-us/faculty-medicine-and-health-technology

Pirkanmaan hyvinvointialue

Pirkanmaan hyvinvointialue – kohti asukaslähtöisiä digitaalisia palveluita
Pirkanmaan hyvinvointialueella asuu yli puoli miljoonaa ihmistä, mikä tekee alueesta väkiluvultaan Suomen suurimman hyvinvointialueen. Se vastaa sosiaali-, terveys- ja pelastustoimesta 23 kunnassa [1]. Hyvinvointialueella on yhteensä noin 20 000 työntekijää, mikä tekee siitä myös alueen suurimman työnantajan.

Pirkanmaan hyvinvointialueen strategia vuosille 2023-2025 keskittyy neljään strategiseen kärkiteemaan, jotka ovat keskeisiä alueen toiminnan ja palveluiden kehittämisessä [2].

1. **Yhdessä toimiva hyvinvointialue**: Tavoitteena on rakentaa sujuvat ja oikea-aikaiset hoito- ja palveluketjut, käyttää monituottaja ja -kanavaisia palvelumalleja sekä panostaa ennaltaehkäisyyn sekä hyvinvoinnin ja terveyden edistämiseen tiiviissä yhteistyössä kuntien ja järjestöjen kanssa.
2. **Tasapuoliset, ennaltaehkäisevät ja tehokkaat palvelut**: Palvelut perustuvat tarpeeseen, näyttöön ja tutkimukseen. Tavoitteena erinomainen asiakaskokemus ja saavutettavat palvelut, joissa asukkaat ja henkilöstö otetaan mukaan palveluiden suunnitteluun ja kehittämiseen.
3. **Ihmiset ensin**: Hyvinvointialue ansaitsee asukkaiden ja yhteisöjen luottamuksen. Turvallisuus kuuluu kaikille, ja palvelut suunnitellaan ihmisiä ja vastuullisuutta ajatellen. Tavoitteena on luoda luottamuksen ilmapiiri sekä valmennuksen ja johtamisen kulttuuri.
4. **Hyvinvoivat työntekijät:** Hyvinvointialue on vahva ja houkutteleva työpaikka, jossa henkilöstöä tuetaan ja kannustetaan kehittämään taitojaan ja osaamistaan.

Strategian täytäntöönpanon seurantaan ja arviointiin liittyy täytäntöönpano-ohjelma. Toteutus sisältää tietopohjan ja arvioinnin vahvistamisen luomalla vahvan tiedolla johtamisen kulttuurin.

Hyvinvointialue tekee tiivistä yhteistyötä kuntien ja eri järjestöjen kanssa väestön hyvinvoinnin ja terveyden edistämiseksi. Näillä kumppaneilla on tärkeä rooli erityisesti ennaltaehkäisevässä työssä, ja yhteistyötä kehitetään jatkuvasti.

Pirkanmaan hyvinvointialueella on kehitetty monipuolisesti digitaalisia palveluita, jotka helpottavat asukkaiden asiointia ja parantavat palveluiden saavutettavuutta. Sivustolle on tuotettu tietosisältöä tukemaan asukkaiden hyvinvointia ja terveyttä. Tällaisia sivustoja ovat Hyvinvointia elintavoilla, Digiperhe, Digilähitori ja Nepsy – neuropsykiatriset vaikeudet. Asukkaita opastavien tietosisältöjen lisäksi on mahdollista luoda digitaalisia ilmoituksia tai maksulaskureita palveluhintojen itsearviointia varten.

Digitaaliset palvelut asukkaiden omaan, tai heidän puolestaan tehtyyn, vahvaan tunnistautumiseen on koottu OmaPirha-portaaliin. Portaali sisältää sähköiset lomakkeet, ajanvaraukset, sosiaalipalvelujen hakemukset sekä mahdollisuuden ilmoittautua ryhmään. OmaPirhaan on rekisteröitynyt yli 230 000 henkilöä. Keväällä 2024 lanseerattu Digiklinikka tarjoaa nopean ja helpon tavan hallita terveyshuolia mobiilisovelluksen tai verkkosivujen kautta [3]. Digiklinikalla on jo yli 100 000 asiakasta ensimmäisen kuuden toimintakuukauden aikana. Kotihoito on yksi digitalisoituneimmista palveluista. Jo yli 1 000 kotihoidon asiakkaalla on lääkeautomaatti ja videovälitteisiä käyntejä tehdään kuukausittain yli 14 000. Yliopistosairaalan potilaita palvelee OmaTays-portaali, joka rekisteröi noin 400 uutta potilasta kuukaudessa.

Pirkanmaan hyvinvointialueen digitaaliset palvelut ovat keskeinen osa maakunnan strategiaa tarjota kattavia, yhdenvertaisia ja saavutettavia palveluja kaikille kuntalaisille. Digitaalisten palveluiden tulevaisuus näyttää lupaavalta.

1] The wellbeing services county of Pirkanmaa, Pirha.fi in English. https://www.pirha.fi/web/english/about-us/about-the-wellbeing-services-county-of-pirkanmaa

[2] The strategy of the Wellbeing services county of Pirkanmaa / Pirkanmaan hyvinvointialueen strategia 2023-2025, https://www.pirha.fi/strategia

[3] Digital clinic. Pirha.fi in English. https://www.pirha.fi/en/web/english/as-a-client/digital-services-at-your-disposal/digital-clinic

The wellbeing services county of Pirkanmaa

Wellbeing services county of Pirkanmaa – towards resident-oriented digital services

Wellbeing services county of Pirkanmaa is the largest wellbeing region in Finland in terms of population, with over half a million inhabitants. It is responsible for social welfare, health care and rescue services in 23 municipalities [1]. Wellbeing services county has a total of around 20 000 employees, making it the largest employer in the region.

The strategy of wellbeing services county of Pirkanmaa for 2023-2025 focuses on four strategic key themes, which are central to the development of the region's activities and services [2].

1. **A well-being region that works together**: The aim is to build smooth and timely care and service chains, to use multi-producer and multi-channel service models, and to invest in prevention and the promotion of well-being and health in close cooperation with municipalities and organizations
2. **Equitable, preventive and effective services**: Services will be based on need, evidence and research. Aiming for an excellent customer experience and accessible services, where residents and staff are involved in the planning and development of services.
3. **People first**: A well-being area earns the trust of residents and communities. Safety is everyone's business, and services are designed with people in mind and accountability. The aim is to create an atmosphere of trust and a culture of coaching and leadership.
4. **Prosperous employees**: The Well-being Region is a strong and attractive workplace, where staff are supported and encouraged to develop their skills and competences.

The monitoring and evaluation of the implementation of the strategy is accompanied by an implementation programme. Implementation includes strengthening the knowledge base and evaluation by creating a strong culture of knowledge management.

Wellbeing services county will work closely with municipalities and various organisations to promote the well-being and health of the population. These partners play an important role, particularly in preventive work, and cooperation is continuously being developed.

Wellbeing services county of Pirkanmaa has developed a wide range of digital services that make it easier for residents to do business and improve the accessibility of services. Information content has been produced for the website to support the well-being and health of residents. These include the Wellbeing through Lifestyle (hyvinvointia elintavoilla), Digital Family (Digiperhe), Digital Hub (Digilähitori) and Nepsy - neuropsychiatric difficulties sites. In addition to information content to help guide residents, there is also the possibility to create digital notifications or payment calculators for self-assessment of service prices.

The digital services for residents' own, strong authentication or on behalf of residents have been brought together in the OmaPirha portal. The portal includes digital forms, appointment booking facilities, applications for social services or the possibility to enrol in a group. More than 230 000 people are registered with OmaPirha. Launched in spring 2024, the Digital Clinic offers a quick and easy way to manage your health concerns via a mobile app or website [3]. More than 100,000 customers have already used Digital clinic (Digiklinikka) in the first six months of its operation. Home care is one of the most digitalized services. More than 1,000 home care clients already have a medication dispenser and more than 14,000 video-mediated visits are made every month. Patients at the University Hospital are served by the OmaTays portal, which registers around 400 new patients per month.

Digital services in the Wellbeing services county of Pirkanmaa are a key part of the region's strategy to provide comprehensive, equal and accessible services to all residents. The future of digital services looks promising.

1] The wellbeing services county of Pirkanmaa, Pirha.fi in English. https://www.pirha.fi/web/english/about-us/about-the-wellbeing-services-county-of-pirkanmaa

[2] The strategy of the Wellbeing services county of Pirkanmaa / Pirkanmaan hyvinvointialueen strategia 2023-2025, https://www.pirha.fi/strategia

[3] Digital clinic. Pirha.fi in English. https://www.pirha.fi/en/web/english/as-a-client/digital-services-at-your-disposal/digital-clinic

Tampereen Ammattikorkeakoulu (TAMK)

Tampereen ammattikorkeakoulu
Tampere University of Applied Sciences

Tampereen ammattikorkeakoulu on monialainen ja arvostettu kouluttaja, työelämän kehittäjä ja yhteistyökumppani. TAMKin vaikuttavuus näkyy erityisesti Pirkanmaalla, mutta myös kansallisesti ja kansainvälisesti.

Soveltava tutkimus-, kehitys-, innovaatio- ja osaamistoiminta TAMKissa

Tutkimus-, kehitys-, innovaatio- ja osaamistoiminta (TKIO) yhdistää Tampereen ammattikorkeakoulun monialaisen osaamisen sekä modernit oppimis- ja innovaatioympäristöt yhteistyökumppaneiden ja yhteiskunnan tarpeisiin. Yhteiskunnallinen näkökulma on keskeisesti mukana kaikessa TAMKin TKIO-toiminnassa. Keskitymme erityisesti kestävämmän ja oikeudenmukaisemman maailman luomiseen. Kehitämme uusia, laaja-alaisia ratkaisuja alueellisiin ja valtakunnallisiin tarpeisiin. Sovellamme uusinta tutkimustietoa työelämälähtöisesti. Toimimme yritysten, yhteisöjen ja julkisen sektorin kanssa. Hyödynnämme systemaattisesti kotimaisia ja kansainvälisiä rahoitusinstrumentteja elinkeinoelämän hyväksi. TAMKin vuoden 2023 ulkopuolinen T&K-rahoitus oli 8,2 miljoonaa euroa.

TAMKin TKIO-toiminnan teemakokonaisuudet ja teema-alueet

Lähtökohtana TKIO-toiminnassamme on globaali vastuullisuus ja ilmastonmuutoksen hillitseminen. Tuotamme ratkaisuja vihreän ja oikeudenmukaisen siirtymän teemakokonaisuuksiin, joissa yhdistyvät Tampereen ammattikorkeakoulun vahvat osaamisalueet ja yhteiskunnan muuttuvat tarpeet. Teemakokonaisuuksiin olemme valinneet kahdeksan teema-aluetta, joita edistämme Soveltavan tutkimuksen keskuksen (ARC), osaamisyksiköiden ja Projektitoimiston (PMO) vahvassa yhteistyössä. ARCin erityistehtävänä on vahvistaa TAMKin ja Pirkanmaan profiilia soveltavassa monialaisessa TKI-toiminnassa sekä lisätä alueen yritysten ja yhteisöjen TKI-toimintaa, sen kansainvälisyyttä, palvelukykyä ja vaikuttavuutta.

Vihreän siirtymän teemakokonaisuus vastaa Euroopan vihreän kehityksen ohjelmaan, jolla Euroopasta tehdään kilpailukykyinen, ilmastoneutraali talous vuoteen 2050 mennessä. Suomen tavoitteena on olla hiilineutraali jo vuonna 2035 ja hiilinegatiivinen nopeasti sen jälkeen. Vihreän siirtymän teema-alueilla Digitalisaatio, Kestävyys ja Tuotantotalous tuotamme uusia teknologiota ja ekologisia innovaatioita vihreän siirtymän edistämiseksi.

Oikeudenmukaisen siirtymän teemakokonaisuus vastaa toiseen Euroopan vihreän kehityksen ohjelman keskeiseen tavoitteeseen, joka on siirtymä kohti ilmastoneutraalia taloutta sosiaalisesti oikeudenmukaisella ja osallistavalla tavalla. Tavoitteena on, että ketään ei jätetä jälkeen vihreässä ja digitaalisessa siirtymässä, ja että siirtymä edistää yhteiskunnallista tasa-arvoa ja ihmisoikeuksia. Oikeudenmukaisen siirtymän teema-alueilla Pedagogiikka, Resilientti yhteiskunta ja Tiedolla johtaminen ja dataratkaisut tuotamme työelämää uudistavaa jatkuvaa oppimista, pedagogiikkaa ja ohjausta sekä vastaamme yhteiskunnan sosiokulttuurisiin haasteisiin. Lisäksi TAMKin edellisiä teemakokonaisuuksia läpileikkaavat Innovaatioiden johtamisen ja Luovan talouden teema-alueet. Ensimmäisessä **t**utkimme, millaista on tänä päivänä tarvittava innovaatiojohtaminen, innovaatiojohtamista edistävä kulttuuri sekä millaisia strategioita tarvitaan innovaatiojohtamisen toteutumiseksi. Luova talous yhdistää taidetta, teknologiaa ja liiketoimintaa uudella, innovatiivisella tavalla.

TAMK lukuina:

Tampere University of Applied Sciences (TAMK)

Tampereen ammattikorkeakoulu
Tampere University of Applied Sciences

Tampere University of Applied Sciences is a multidisciplinary and respected educator, developer and partner of working life. TAMK's impact is particularly visible in the Tampere region, but also nationally and internationally.

Applied research, development and innovation activities at TAMK

At Tampere University of Applied Sciences, research, development, innovation and competences (RDIC) combine our multidisciplinary expertise and modern learning and innovation environments with the needs of our cooperation partners and society. The social perspective is essential in all TAMK's RDIC activities. We are developing new and extensive solutions for regional, national and global needs. We apply the latest research into working life and cooperate with both companies and the public sector. We particularly focus on creating a more sustainable and just world, and systematically utilize domestic and international funding instruments for the benefit of the economy. TAMK's external R&D funding in 2023 was 8.2 million euros.

Thematic and theme areas of RDIC activities at TAMK

The starting point for our research and development activities is global responsibility and climate change mitigation. We produce solutions in areas of green and just transition that combine the strong competence areas of Tampere University of Applied Sciences with the changing needs of society. We have selected eight theme areas in the green and just transition to contribute our applied RDIC activities through strong collaboration with the Applied Research Center (ARC), TAMK schools and the Project Management Office (PMO). ARC's special task is to strengthen the profile of TAMK and the Tampere Region in multidisciplinary applied RDI activities and to increase the RDI activities of local companies and communities, their internationality, service capacity, and impact

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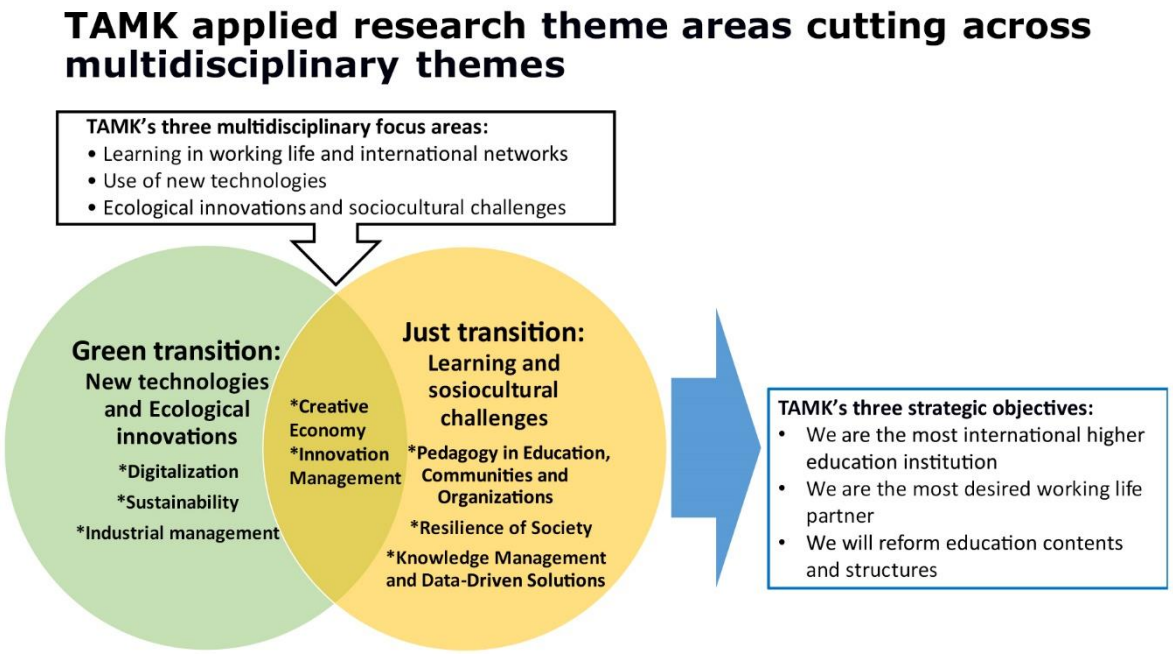
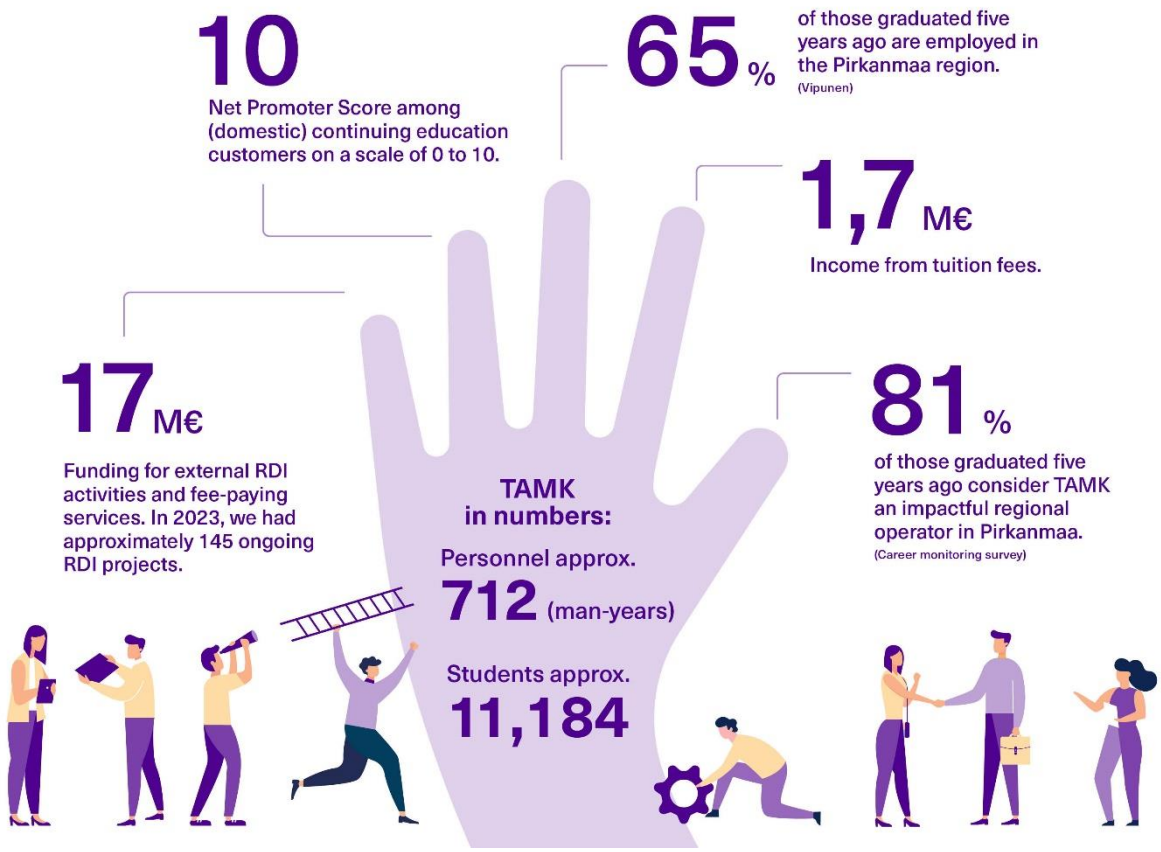


The green transition thematic area aligns with the European Green Deal, aiming to make Europe a competitive, climate-neutral economy by 2050. Finland's goal is to be carbon-neutral by 2035 and carbon-negative soon after. In our theme areas of Digitalization, Sustainability, and Industrial management, we produce new technologies and ecological innovations to advance the green transition.

The just transition thematic area addresses another key goal of the European Green Deal, which is the transition to a climate-neutral economy in a socially just and inclusive manner. The aim is that no one is left behind in the green and digital transition and that the transition promotes social equality and human rights. In the just transition theme areas of Pedagogy, Resilient society, and Knowledge management and data-driven solutions, we produce continuous learning, pedagogy, and guidance that renew the working life and address the socio-cultural challenges of society.
Additionally, the theme areas of Innovation management and Creative economy cut across TAMK's previous thematic entities. In the first, we study the nature of the innovation management required today, the culture that promotes innovation management, and the strategies therein. The creative economy combines art, technology, and business in a new, innovative way.

TAMK in numbers:



International Society for Telemedicine and eHealth

Your Global Partner in Digital health

Missio
IsfTeH:n missio on helpottaa tiedon ja kokemusten kansainvälistä levittämistä telelääketieteestä ja sähköisestä terveydenhuollosta, tarjotakseen pääsyn alan asiantuntijoille maailmanlaajuisesti ja tarjotakseen ennennäkemättömiä verkostoitumismahdollisuuksia kansainväliselle telelääketieteen ja sähköisen terveydenhuollon yhteisölle.

IsfTeH edistää ja tukee digitaalista terveystoimintaa maailmanlaajuisesti toimimalla kansallisten digitaalisen terveydenhuollon ammattiyhdistysten ensisijaisena maailmanlaajuisena kattojärjestönä kaikissa maissa, ja näin tarjoamme apua uusien kansallisten organisaatioiden käynnistämiseen. Olemme valtiosta riippumaton ja voittoa tavoittelematon yhteisö, jolla on muodolliset siteet Yhdistyneiden Kansakuntien erityisjärjestöihin, jotka liittyvät suoraan maailmanlaajuiseen terveyteen. Sveitsin lainsäädännön mukaisesti perustettu yritys on poliittisesti neutraali ja demokraattinen, ja olemme sitoutuneet palkkiorakenteemme oikeudenmukaisuuteen ja institutionaaliseen politiikkaan, joka tukee monimuotoisuutta, oikeudenmukaisuutta ja osallisuutta jäsenistössämme. Lopuksi meitä ohjaa epäsuora vala edistää ympäristöä, kestävyyttä ja hyvää hallintotapaa (ESG).

Vuodesta 2008 lähtien IsfTeH:lle on myös myönnetty "kansalaisjärjestön asema virallisessa suhteessa Maailman terveysjärjestöön", mikä tekee siitä kansainvälisen viittauksen telelääketieteessä ja sähköisessä terveydenhuollossa terveyspoliittisille päättäjille ympäri maailmaa. ISFTeh osallistuu kansallisten jäsenyhdistystensä sekä kurssien ja konferenssien kautta sähköisen terveydenhuollon koulutus- ja toteutussuunnitelmien laatimiseen ja tarjoaa tarvittaessa apua ja koulutusta.

Nykyiset työryhmät ovat seuraavat: paremmat sähköiset terveyspalvelut, valmiuksien kehittäminen, digitaalisen muutoksen johtajuus, terveydenhuollon erot ja digitaalinen terveys, sairaanhoitajat ja kätilöt, avaruus ja äärimmäiset ympäristöt, teleaudiologia, telekardiologia, teleurologia, naisia käsittelevä työryhmä (WoW).

Liity jäsenorganisaatioiden verkostoomme, joka kattaa jäsenyyksiä yli 110 maasta ja alueelta ympäri maailmaa. IsfTeH on ovesi maailmanlaajuiseen telelääketieteen ja sähköisen terveydenhuollon yhteisöön.

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NGO in official
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International Society for Telemedicine and eHealth

Your Global Partner in Digital health

Mission Statement
IsfTeH exists to facilitate the international dissemination of knowledge and experience in Telemedicine and eHealth, to provide access to rganizing experts in the field worldwide, and to offer unprecedented networking opportunities to the international Telemedicine and eHealth community.

The IsfTeH promotes and supports digital health activities worldwide, by serving as the primary global umbrella organization for national digital health professional societies in all countries, and in this vein, we provide assistance for the start-up of new national organizations. We are a non-governmental and not-for-profit society, with formal ties to United Nations specialized agencies that are directly relevant to global health. Established under Swiss law, we are politically neutral and democratic, with a commitment to fairness in our fee structure and an institutional policy supportive of diversity, equity and inclusion in our membership. Finally, we are driven by an implicit oath to furthering the cause of the environment, sustainability and good governance (ESG).

Since 2008, the IsfTeH has also been awarded the status of "NGO in Official Relation with the World Health Organization", making it an international reference in Telemedicine and eHealth for health policy makers from around the world. Through its national member associations and through courses and conferences, the IsfTeH does participate in the establishment of eHealth training and implementation plans, and provides assistance and education where needed.

Current Working Groups are as follows: Better eHealth, Capacity Building, Digital Transformation Leadership, Healthcare Disparities and Digital Health, Nurses and Midwives, Space and Extreme Environments, Tele-Audiology, Tele-Cardiology, Tele-Urology, Working Group on Women (WoW)

Join our network of member organizations from over 110 countries and territories around the world (…and growing). The IsfTeH is your door to the global Telemedicine and eHealth community.

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Tampere University
www.tuni.fi/en

Tampere university of applied science
www.tuni.fi/en

Pirkanmaan hyvinvointialue
www.pirha.fi

Business Tampere
www.businesstampere.com

HealthHub Finland EDIH
https://healthhubfinland.eu/

Laurea Ammattikorkeakoulu
https://www.laurea.fi/

Länsi-Uudenmaan hyvinvointialue
https://www.luvn.fi/fi

MOKUVE - Multidisciplinary Rehabilitation Network
https://www.jyu.fi/en/node/129134/mokuve-monitieteinen-kuntoutuksen-verkosto

Nuanic Oy
https://nuanic.com/

SMARTmedi Oy
https://www.smartmedi.fi/

Sensotrend Oy
https://www.sensotrend.fi/

Special thanks to the Tampere University of Applied Sciences students for conference arrangements.

Sisällysluettelo / Table of contents

Ohjelma / Program

Torstai 14.11.2024 (Finnish track)
Paikka: Tampereen yliopisto, Keskustakampus, Päätalo (Kalevantie 4, 33100 Tampere)

9:00-10:30	**Rekisteröityminen pääaulassa**
10:30-11:30	**Sessio 1: From research to impact in digital health and welfare services (englanniksi)**

Puheenjohtaja: Outi Ahonen, Finnish Society of Telemedicine and eHealth (FSTeH)

Tervetuloa
Chair Outi Ahonen, Finnish Society of Telemedicine and eHealth (FSTeH)
Associate Professor Tuomas Koskela, Tampereen Yliopisto

Current and future impacts of AI on Health Care
Associate professor Georg Dorffner
Medical University of Vienna, Austria

eHealth palkintoseremonia
Outi Ahonen and Pirkko Kouri, Finnish Society of Telemedicine and eHealth (FSTeH)

11:30-12:30	**Lounas (Yliopiston ravintola, 2.kerros) ja näyttely**	
12:30-14:00	**Sessio 2A : Artificial Intelligence (englanniksi)**	**Sessio 2B: Digitaaliset vastaanotot (suomeksi)**
	Puheenjohtaja: Mark Van Gils, Tampere University	Puheenjohtaja: Tuomas Koskela, Tampereen yliopisto

Kutsuluennot:

Collaborative Machine Learning for Healthcare
Professor Samuel Kaski, Aalto University and University of Manchester

How could AI help the clinician?
Professor Jussi Hernesniemi, Tampere University

Digitaaliset vastaanotot perusterveydenhuollossa
Vastaava lääkäri ja tohtorikoulutettava Kaisa Kujansivu, Terveysasemapalvelut Pihlajalinna Oy ja Tampereen yliopisto

Käytännön kokemuksia etävastaanotoista Pirkanmaalta
Projektipäällikkö Aino Nokelainnen, Pirkanmaan hyvinvointialue

Tieteelliset esitykset:

O-1 Detecting Flow States in Gaming Environments Using Entropy-Based Features and Consumer-Oriented EEG Headbands
Matin Beiramvand, Reijo Koivula, Tarmo Lipping

O-2 Exploring robustness of a 12-leads arrhythmia classifier: A multi-database approach
Long Dang, Pedro A. Moreno-Sánchez, Mark van Gils

O-3 Clarifying the development phases and related regulation of predictive AI models for clinical decision-making: a framework proposal
Marketta Niemelä, Miikka Keski-Säntti, Katja Nolvi, Ira Haavisto, Tuukka Hakkarainen, Santtu Kivelä, Carina Dantas, Miriam Cabrita, Riikka-Leena Leskelä

O-4 Risk management to health artificial intelligence applications
Alpo Värri

O-5 Experiences of Using Digital and Remote Health Services to Support Work Ability: A Qualitative Interview Study
Elina Kervinen, Lauri Vähätalo, Anna Siukola, Tiia Reho, Klas Winell, Riitta Sauni

O-6 Developing digital services for assessing diet quality, having automated feedback, and getting support for dietary changes: Ravitsemusnavigaattori & Ravitsemuspolku
Elina Järvelä-Reijonen, Jesse Honkanen, Kirsikka Aittola, Iiro Välimaa, Henna Lehikoinen, Maria Lankinen, Marjukka Kolehmainen

O-7 The effectiveness of exergaming (YetiHome®) versus traditional exercise for older people mobility and balance: protocol of the randomized intervention trial
Sari Arolaakso, Sinikka Lotvonen, Satu Elo

O-8 Establishing the Remote Consultation Working Group of the Finnish Society of Telemedicine and eHealth: Towards Best Practices
Paula Veikkolainen, Marja Nieminen, Mika Fiskari, Kaisa Kujansivu, Mikko Vesamäki, Sanna Pesonen, Eero Latva-Rasku, Jouni Turunen, Aleksi Schrey

Yritysesittelyt:

Business Turku / EDIH

MOKUVE – Multidisciplinary Rehabilitation Network

Nuanic Oy

SMARTmedi Oy

14:00-14:30	**Kahvi, näyttely ja posterinäyttely (Juhlasalin aula, 2.kerros)**	
14:30-16:00	**Sessio 3A: Cybersecurity and Regulations (session in English)**	**Sessio 3B: Digiosaamisen vahvistaminen (suomeksi)**
	Puheenjohtaja: Alpo Värri, Tampere University	Puheenjohtaja: Outi Ahonen, Suomen Telelääketieteen ja e-Health seura (SteHS)
		Kutsuluennot:
	The impact of new and upcoming cybersecurity regulations Director Standardization Product Security Ben Kokx, Philips, The Netherlands	**Mitä kuuluu sote-henkilöstön digiosaamiselle – tilannekuva hyvinvointialueilta ja parhaita käytänteitä** Sosiaali- ja terveydenhuollon kehittämisen asiantuntija, terveystieteiden tohtori, selvityshenkilö Merja Tepponen
	Acute cyber security situation in Finnish healthcare and long-term recommendations Senior specialist Perttu Halonen, National Cyber Security Centre Finland	**Digitalisaatio-osaamisen viitekehys syöpää sairastavan hoidossa** yliopettaja Virpi Sulosaari, Turun Ammattikorkeakoulu
		Tieteelliset esitykset:
	O-9 Feasibility of Synthetic Tabular Data for the Research and Development of Clinical Decision Support with Ischemic Stroke Use Case Aysen Degerli, Harri Pölönen, Juha Pajula, Miikka Kivioja, Aino-Lotta Alahäivälä, Arho Virkki	**O-12 Perceptions of AI-assisted welfare services: Readiness, reliance and realism** Tuuli Turja, Outi Ahonen
	O-10 Secondary use of health care data and needed competencies Sari Räisänen, Kristina Helminen, Jyri Rajamäki, Maria do Carmo Gomes, Outi Ahonen	**O-13 Educational interventions and their effects on healthcare professionals' digital competence development: A systematic review** Emma Kulju, Erika Jarva, Anne Oikarinen, Mira Hammarén, Outi Kanste, Kristina Mikkonen
	O-11 Information and Data Management on Planetary Health and Wellbeing within Transatlantic Ecosystem Model Laura Tahvanainen, Birgitta Tetri, Outi Ahonen	**O-14 General digital competencies of Biomedical Laboratory Scientists, Laboratory Technologists and Radiographers** Eeva Liikanen, Marja Jaronen, Piia Kanto, Marianne Ellegaard, Henriette Lorenzen, Morten E. Moeller, Søren Jørgensen, Harmen Bijwaard, Richard Fjellaksel
	Yritysesittelyt: Business Turku / EDIH	**O-15 From Beds to Bytes – virtual wards in healthcare** Lotta Eronen, Pauleen Mannevaara, Jonas Danielson
		O-16 Initial experiences of Virtual patient simulator in "As a substitute doctor at Virtual Village health center" Education Course for Medical Students in Finland Tiina Salmijärvi, Henri Takalo-Kastari, Anu Kajamaa, Hanni Muukkonen, Petri Kulmala, Joni Lämsä, Jarmo Reponen
		O-17 "Human dignity and sense of meaningful life"- remote rehabilitation intervention modelling to people with cerebrovascular accident and multiple sclerosis Tuulikki Sjögren, Hilkka Korpi
		Yritysesittelyt: Länsi-Uudenmaan hyvinvointialue Laurea / ManagiDITH
16:00-16:30	**Kahvi, näyttely ja posterinäyttely (Juhlasalin aula, 2.kerros)**	

16:30-18:00	**Sessio 4A: Uptake and impact of digitalization (englanniksi)**	**Sessio 4B: Päätöksenteon tuki ja Tekoäly käytännössä (suomeksi)**
	Puheenjohtaja: Paula Veikkolainen, Finnish Society of Telemedicine and eHealth (FSTeH)	Puheenjohtaja: Jarmo Reponen, Suomen Telelääketieteen ja e-Health seura (SteHS)
	Kutsuluennot:	
	Health care digitalization across EU member states – past achievements and new challenges Dr., Adjunct Professor, Board member of International Society for Telemedicine and eHealth Karl A. Stroetmann, School of Health Information Science, University of Victoria, Canada	**Päätöksentuki lääkärintyössä** päätoimittaja Johannes Lyytikkä, Kustannus oy Duodecim
	User experience of health IT in the course of years in Denmark Professor Christian Nøhr, Aalborg University, Denmark	**Tekoälyn implementointi terveydenhuoltoon** TKI-johtaja Johan Sanmark, Länsi-Uudenmaan hyvinvointialue
	Tieteelliset esitykset:	
	O-18 Patients' perspective on using consumer wearables for digital remote monitoring at home Melika Azim Zadegan, Rosa Sahlström, Eeva Aromaa, Tero Montonen, Päivi Eriksson, Ville Leinonen	**O-23 Most importantly, AI liberates time for the patient: a classification and prioritization of artificial intelligence uses for wellbeing services counties** Marketta Niemelä, Tommi Kemppainen
	O-19 The relationship between attitudes, emotions and the intention to use digital rehabilitation solutions: Insights from Rwandan rehabilitation professional Kaisa Lällä, Eeva Aartolahti, Michael Oduor, David Tumusiime, Katariina Korniloff	**O-24 Co-development is crucial for implementing large language models for social and health care** Jaana Kokko, Roni Huhta, Mikko Reinikka, Timo Alalääkkölä, Miia Jansson, Henna Härkönen, Santeri Rytky, Miika T. Nieminen, Jarmo Reponen, Heikki Mikkonen
	O-20 Prevention and Well-being in the Cross-border Region: WellData, an Innovative Collaboration for Data Exchange Elisabeth Honinx, Annelies Van den Eynde, Pieter Van Gorp, André Boorsma, Jildau Bauman, Vicky der Auwera, Kim Helsen, Nathalie Lambrechts	**O-25 Searching informal information after a medical appointment** Tuuli Turja, Milla Rosenlund, Virpi Jylhä
	O-21 Chain of Portable Health Folder: A Systematic Literature Review Duarte Mateus, Ana Lúcia Martins, Ricardo Correia	**O-26 Representing relative workload variation in home care teams to facilitate workload management** Joona Koistinen, Päivi Sanerma, Hanna Naakka
	O-22 Remote monitoring for hypertension management: evaluating the effectiveness of telemedicine in rural Kentucky Naya Chopra, Lalit Vadlamani	**O-27 Managing Complex Patient Processes Using Process Mining on Electronic Health Records: Preliminary Findings of a Case Study on Multiple Sclerosis** Märt Vesinurm, Valtteri Lipsanen, Lauri Saarinen, Paul Lillrank, Paulus Torkki, Laura Mäkitie, Sini M Laakso Miika Koskinen
	Yritysesittelyt:	
	Sensotrend Laurea / ManagiDITH	SMARTmedi Oy Business Turku/ EDIH Nuanic Oy
19:30-22:30	**Illallinen (Paja Kongressi, Sokos Hotel Torni Tampere, osoite: Ratapihankatu 43)**	

Perjantai 15.11.2024 (Finnish track)

Paikka: Tampereen yliopisto, Keskustakampus, Päätalo (Kalevantie 4, 33100 Tampere)

8:30-9:30 Sessio 5: eHealth Economics (englanniksi)

Puheenjohtaja: Eero Latva-Rasku, Finnish Society or Telemedicine and eHealth (FSTeH)

Evaluating effectiveness and cost-effectivess of digital healthcare technologies
Professor Mika Kortelainen, University of Turku, Finnish Institute for Health and Welfare

Assessing the (cost)effectiveness of eHealth/Digital solutions
Professor Janne Martikainen, University of Eastern Finland

Yritysesittelyt:

Business Turku / EDIH

9:30-11:00 Kahvi ja tutustuminen digitaalisiin ratkaisuihin ("Gallery walk": TAMK, TAU ja Pirha)

TAMK Sote Virtual Lab (Sali A08)
Tampereen ammattikorkeakoulun oppimis- ja kehittämisympäristö, jossa kehitämme, testaamme, tutkimme ja opetamme monialaisesti ja käyttäjäkeskeisesti etä-, virtuaali ja digitaalisia ratkaisuja ja palveluita.

Tampereen yliopisto: Fysiologisten mittausten tutkimus- ja testauspalvelut sekä ajankohtaiset tutkimushankkeet eTerveyden ja eHyvinvoinnin alueilla (Sali A07)
Esittelemme Tampereen yliopiston Health and Assistive Technology -laboratoriossa tehtävää tutkimusta ja yritysyhteistyötä. Lisäksi esittelemme kaksi merkittävää EU-rahoitteista kansainvälistä tutkimushanketta, jotka alkoivat vuonna 2024 (teemat: digitaaliset kaksoset, mallinnus, hajautettu data-analyysi), sekä juuri käynnistyneen Tomorrow's Sports and Health Campus hankkeen, jota rahoittaa Pirkanmaan liitto ja johon osallistuu laaja verkosto toteuttajapartnereita tehden yhteistyötä alueen pk-yritysten kanssa hyvinvoinnin ja ennaltaehkäisevien ratkaisujen parissa.

Pirha, DigiClinic (Sali A06)
Esittelypisteellä voi tutustua Suomen suurimman hyvinvointialueen monipuolisiin digitaalisiin asiointimahdollisuuksiin ja palveluihin, kuulla raportointitietoa ratkaisuihin liittyen ja tutustua Pirkanmaan digiklinikan toimintamalliin.

11:00-12:30

Sessio 6A: Data Access and Data Quality (englanniksi)

Puheenjohtaja: Vesa Jormanainen, Finnish Society of Telemedicine and eHealth (FSTeH)

Kutsuluennot:

European health data space and preparatory actions
Project manager Markus Kalliola, Finnish Innovation Fund SITRA

Experiences on nation-wide health data harmonization: commitment to shared goal, data quality and federated analyses
Senior Medical Advisor Tarja Laitinen, University of Helsinki, Finland

Tieteelliset esitykset:

O-28 Assessment and reimbursement models for digital health technologies in different European countries
Jari Haverinen, Raija Järvinen, Teemu Mustola, Petra Falkenbach

O-29 Compatibility of medical risk calculators with data from Finnish National Health Record System
Viljami Männikkö, Klaus Förger, Henna Urhonen

Sessio 6B: Digiratkaisujen näyttö käytännössä (suomeksi)

Puheenjohtaja: Juhamatti Huusko, Suomen Telelääketieteen ja e-Health seura (SteHS)

Kutsuluennot:

Miten voimme tutkia terveydenhuollon digiratkaisujen näyttöä?
apulaisprofessori Paulus Torkki, Helsingin yliopisto

Mitä kokemuksia meillä on terveydenhuollon digitaalisten ratkaisujen arvioinnista?
arviointipäällikkö Petra Falkenbach, FinCCHTA, Pohde

Tieteelliset esitykset:

O-30 Leveraging Digital Twin Technology for Healthcare: Mapping Potential Benefits and Impacts through a Hypertrophic Cardiomyopathy Case Study
Annariina Koivu, Mark van Gils, Antti Ahola, Jari Hyttinen

O-31 Participatory design in the development of a mobile application for the NFBC1966 follow-up study: initial steps in the STAGE project
Erika Jarva, Tiia Yrttiaho, Minna Isomursu

Yritysesittelyt:

Sensotrend

Laurea/ ETAPLATE

O-32 Value Co-creation and Co-destruction in Digital Health Services: Preliminary Findings of Systematic Review
Elina Laukka, Tuure Tuunanen, Miia Jansson, Minna Vanhanen, Nina Hirvonen, Jenni Palukka, Märt Vesinurm, Paulus Torkki

O-33 Ecosystem Supporting Commercialization of Digital Health Innovations
Pauliina Tryykilä, Elina Kontio

Yritysesittelyt:

Business Turku/ EDIH

MOKUVE - Multidisciplinary Rehabilitation Network

Länsi-Uudenmaan hyvinvointialue

11:30-12:30	**Lounas (Yliopiston ravintola, 2.kerros) ja näyttely**
13:30-14:30	**Sessio 7: Lesson learned in assessing the impact of digital services of health care (englanniksi)**

Puheenjohtaja: Vesa Jormanainen, Finnish Society of Telemedicine and eHealth (FSTeH)

Health in the Digital Age
Eric Sutherland, Adjunct Professor, University of Victoria, Canada; Life Fellow, Royal Society of Medicine, UK; Director, International Society for Telemedicine and eHealth, Switzerland

Do we have evidence, if it is beneficial to organize health care services digitally?
Prof. Dr. Gro Rosvold Berntsen, Norwegian Centre for E-health Research, Tromsoe, Norway

Palkintoseremonia ja loppusanat
Outi Ahonen, Finnish Society of Telemedicine and eHealth (FSTeH)
Tuomas Koskela, Tampere University

Program in English

Thursday 14.11.2024 (English track)

Location: Tampere University, City centre campus, Main building (Kalevantie 4, 33100 Tampere)

9:00-10:30	**Registration, Main lobby**
10:30-11:30	**Session 1: From research to impact in digital health and welfare services (session in English)**

Chair: Outi Ahonen, Finnish Society of Telemedicine and eHealth (FSTeH)

Welcome words
Chair Outi Ahonen, Finnish Society of Telemedicine and eHealth (FSTeH)
Associate Professor Tuomas Koskela, Tampereen Yliopisto

Current and future impacts of AI on Health Care
Associate professor Georg Dorffner
Medical University of Vienna, Austria

eHealth Award Ceremony
Outi Ahonen and Pirkko Kouri, Finnish Society of Telemedicine and eHealth (FSTeH)

11:30-12:30	**Lunch (University Restaurant, 2nd floor) and exhibition**	
12:30-14:00	**Session 2A: Artificial Intelligence (session in English)**	**Sessio 2B: Digitaaliset vastaanotot (session in Finnish)**
	Chair: Mark Van Gils, Tampere University	Chair: Tuomas Koskela, Tampere University
	Invited speeches:	
	Collaborative Machine Learning for Healthcare Professor Samuel Kaski, Aalto University and University of Manchester	**Digital receptions in primary health care** Chief Medical Officer and Doctoral Researcher Kaisa Kujansivu, Pihlajalinna Oy ja Tampere University
	How could AI help the clinician? Professor Jussi Hernesniemi, Tampere University	**Experiences of remote receptions in Pirkanmaa** Project Manager Aino Nokelainen, Pirkanmaan hyvinvointialue
	Scientific Rapid Presentations:	
	O-1 Detecting Flow States in Gaming Environments Using Entropy-Based Features and Consumer-Oriented EEG Headbands Matin Beiramvand, Reijo Koivula, Tarmo Lipping	**O-5 Experiences of Using Digital and Remote Health Services to Support Work Ability: A Qualitative Interview Study** Elina Kervinen, Lauri Vähätalo, Anna Siukola, Tiia Reho, Klas Winell, Riitta Sauni
	O-2 Exploring robustness of a 12-leads arrhythmia classifier: A multi-database approach Long Dang, Pedro A. Moreno-Sánchez, Mark van Gils	**O-6 Developing digital services for assessing diet quality, having automated feedback, and getting support for dietary changes: Ravitsemusnavigaattori & Ravitsemuspolku** Elina Järvelä-Reijonen, Jesse Honkanen, Kirsikka Aittola, Iiro Välimaa, Henna Lehikoinen, Maria Lankinen, Marjukka Kolehmainen
	O-3 Clarifying the development phases and related regulation of predictive AI models for clinical decision-making: a framework proposal Marketta Niemelä, Miikka Keski-Säntti, Katja Nolvi, Ira Haavisto, Tuukka Hakkarainen, Santtu Kivelä, Carina Dantas, Miriam Cabrita, Riikka-Leena Leskelä	**O-7 The effectiveness of exergaming (YetiHome®) versus traditional exercise for older people mobility and balance: protocol of the randomized intervention trial** Sari Arolaakso, Sinikka Lotvonen, Satu Elo
	O-4 Risk management to health artificial intelligence applications Alpo Värri	**O-8 Establishing the Remote Consultation Working Group of the Finnish Society of Telemedicine and eHealth: Towards Best Practices** Paula Veikkolainen, Marja Nieminen, Mika Fiskari, Kaisa Kujansivu, Mikko Vesamäki, Sanna Pesonen, Eero Latva-Rasku, Jouni Turunen, Aleksi Schrey
	Corporate Presentations:	
	Business Turku / EDIH	MOKUVE – Multidisciplinary Rehabilitation Network Nuanic Oy SMARTmedi Oy

14:00-14:30	**Coffee, exhibition and posters (Main Auditorium foyer, 2nd floor)**	
14:30-16:00	**Session 3A: CyberSecurity and Regulations (session in English)**	**Session 3B: Digiosaamisen vahvistaminen (session in Finnish)**
	Chair: Alpo Värri, Tampere University	Chair: Outi Ahonen, Finnish Society of Telemedicine and eHealth (FSTeH)
	Invited speeches:	
	The impact of new and upcoming cybersecurity regulations Director Standardization Product Security Ben Kokx, Philips, The Netherlands	**How is the digital competence of healthcare and social welfare staff? – An overview from wellbeing services counties and best practices** Social and Health Care Development Specialist, Investigation Officer, TtT, selvityshenkilö Merja Tepponen
	Acute cyber security situation in Finnish healthcare and long-term recommendations Senior specialist Perttu Halonen, National Cyber Security Centre Finland	**A Framework for Digital Competence in the Care of Cancer Patients** Principal Lecturer Virpi Sulosaari, Turun Ammattikorkeakoulu
	Scientific Rapid Presentations:	
	O-9 Feasibility of Synthetic Tabular Data for the Research and Development of Clinical Decision Support with Ischemic Stroke Use Case Aysen Degerli, Harri Pölönen, Juha Pajula, Miikka Kivioja, Aino-Lotta Alahäivälä, Arho Virkki	**O-12 Perceptions of AI-assisted welfare services: Readiness, reliance and realism** Tuuli Turja, Outi Ahonen
	O-10 Secondary use of health care data and needed competencies Sari Räisänen, Kristina Helminen, Jyri Rajamäki, Maria do Carmo Gomes, Outi Ahonen	**O-13 Educational interventions and their effects on healthcare professionals' digital competence development: A systematic review** Emma Kulju, Erika Jarva, Anne Oikarinen, Mira Hammarén, Outi Kanste, Kristina Mikkonen
	O-11 Information and Data Management on Planetary Health and Wellbeing within Transatlantic Ecosystem Model Laura Tahvanainen, Birgitta Tetri, Outi Ahonen	**O-14 General digital competencies of Biomedical Laboratory Scientists, Laboratory Technologists and Radiographers** Eeva Liikanen, Marja Jaronen, Piia Kanto, Marianne Ellegaard, Henriette Lorenzen, Morten E. Moeller, Søren Jørgensen, Harmen Bijwaard, Richard Fjellaksel
		O-15 From Beds to Bytes – virtual wards in healthcare Lotta Eronen, Pauleen Mannevaara, Jonas Danielson
	Corporate Presentations:	**O-16 Initial experiences of Virtual patient simulator in "As a substitute doctor at Virtual Village health center" Education Course for Medical Students in Finland** Tiina Salmijärvi, Henri Takalo-Kastari, Anu Kajamaa, Hanni Muukkonen, Petri Kulmala, Joni Lämsä, Jarmo Reponen
	Business Turku / EDIH	**O-17 "Human dignity and sense of meaningful life"- remote rehabilitation intervention modelling to people with cerebrovascular accident and multiple sclerosis** Tuulikki Sjögren, Hilkka Korpi
		Corporate Presentations:
		Western Uusimaa Wellbeing Services County
		Laurea / ManagiDITH
16:00-16:30	**Coffee, exhibition and posters (Main Auditorium foyer, 2nd floor)**	

16:30-18:00	Session 4A: Uptake and impact of digitalization (session in English)	Sessio 4B: Päätöksenteon tuki ja Tekoäly käytännössä (session in Finnish)
	Chair: Paula Veikkolainen, Finnish Society of Telemedicine and eHealth (FSTeH)	Chair: Jarmo Reponen, Finnish Society of Telemedicine and eHealth (FSTeH)
	Invited speeches:	
	Health care digitalization across EU member states – past achievements and new challenges Dr., Adjunct Professor, Board member of International Society for Telemedicine and eHealth Karl A. Stroetmann, School of Health Information Science, University of Victoria, Canada	**Decision Support in Medical Practice** Editor-in-Chief Johannes Lyytikkä, Kustannus oy Duodecim
	User experience of health IT in the course of years in Denmark Professor Christian Nøhr, Aalborg University, Denmark	**Implementing AI in Healthcare** TKI-johtaja Johan Sanmark, Länsi-Uudenmaan hyvinvointialue
	Scientific Rapid Presentations:	
	O-18 Patients' perspective on using consumer wearables for digital remote monitoring at home Melika Azim Zadegan, Rosa Sahlström, Eeva Aromaa, Tero Montonen, Päivi Eriksson, Ville Leinonen	**O-23 Most importantly, AI liberates time for the patient: a classification and prioritization of artificial intelligence uses for wellbeing services counties** Marketta Niemelä, Tommi Kemppainen
	O-19 The relationship between attitudes, emotions and the intention to use digital rehabilitation solutions: Insights from Rwandan rehabilitation professional Kaisa Lällä, Eeva Aartolahti, Michael Oduor, David Tumusiime, Katariina Korniloff	**O-24 Co-development is crucial for implementing large language models for social and health care** Jaana Kokko, Roni Huhta, Mikko Reinikka, Timo Alalääkkölä, Miia Jansson, Henna Härkönen, Santeri Rytky, Miika T. Nieminen, Jarmo Reponen, Heikki Mikkonen
	O-20 Prevention and Well-being in the Cross-border Region: WellData, an Innovative Collaboration for Data Exchange Elisabeth Honinx, Annelies Van den Eynde, Pieter Van Gorp, André Boorsma, Jildau Bauman, Vicky der Auwera, Kim Helsen, Nathalie Lambrechts	**O-25 Searching informal information after a medical appointment** Tuuli Turja, Milla Rosenlund, Virpi Jylhä
	O-21 Chain of Portable Health Folder: A Systematic Literature Review Duarte Mateus, Ana Lúcia Martins, Ricardo Correia	**O-26 Representing relative workload variation in home care teams to facilitate workload management** Joona Koistinen, Päivi Sanerma, Hanna Naakka
	O-22 Remote monitoring for hypertension management: evaluating the effectiveness of telemedicine in rural Kentucky Naya Chopra, Lalit Vadlamani	**O-27 Managing Complex Patient Processes Using Process Mining on Electronic Health Records: Preliminary Findings of a Case Study on Multiple Sclerosis** Märt Vesinurm, Valtteri Lipsanen, Lauri Saarinen, Paul Lillrank, Paulus Torkki, Laura Mäkitie, Sini M Laakso Miika Koskinen
	Corporate Presentations:	
	Sensotrend Laurea / ManagiDITH	SMARTmedi Oy Business Turku/ EDIH Nuanic Oy
19:30-22:30	**Dinner (Paja Congress, Sokos Hotel Torni Tampere, address: Ratapihankatu 43)**	

Friday 15.11.2024 (English track)

Location: Tampere University, City centre campus, Main building (Kalevantie 4, 33100 Tampere)

8:30-9:30 Session 5: eHealth Economics (session in English)

Chair: Eero Latva-Rasku, Finnish Society or Telemedicine and eHealth (FSTeH)

Evaluating effectiveness and cost-effectivess of digital healthcare technologies
Professor Mika Kortelainen, University of Turku, Finnish Institute for Health and Welfare

Assessing the (cost)effectiveness of eHealth/Digital solutions
Professor Janne Martikainen, University of Eastern Finland

Corporate Presentations:

Business Turku / EDIH

9:30-11:00 Coffee and demonstrations to digital solutions ("Gallery walk": TAMK, TAU, Pirha)

TAMK Sote Virtual Lab (Room A08)
In the Virtual Lab for Social and Health Care we develop, test and put forward ideas on tomorrow's digital and intelligent technologies related to basic health care, safe and well-performing home environment, remote care and rehabilitation, telemedicine, and mobile healthcare services.

Tampere University Research and Testing Services for Physiological Measurements, and Current Research Projects in the eHealth and eWelfare Domains (Room A07)
We will present research conducted at the Health and Assistive Technology Laboratory of Tampere University. Additionally, we will introduce two major EU-funded international research efforts that started in 2024 (themes: digital twins, modelling, federated data analysis), and the newly launched Tomorrow's Sports and Health Campus project, funded by the Council of Tampere Region, that involves a wide network of institutes working with SMEs on wellness and preventive solutions in the Pirkanmaa region.

Pirha, DigiClinic (Room A06)
At the stand, you can 31rganizing31 yourself with the diverse digital services and services of Finland's largest wellbeing services county, hear reporting information related to the solutions and 31rganizing31 yourself with the operating model of the Tampere Region Digital Clinic.

11:00-12:30

Session 6A: Data Access and Data Quality (session in English)

Chair: Vesa Jormanainen, Finnish Society of Telemedicine and eHealth (FSTeH)

Invited speeches:

European health data space and preparatory actions
Project manager Markus Kalliola, Finnish Innovation Fund SITRA

Experiences on nation-wide health data harmonization: commitment to shared goal, data quality and federated analyses
Senior Medical Advisor Tarja Laitinen, University of Helsinki, Finland

Scientific rapid presentations:

O-28 Assessment and reimbursement models for digital health technologies in different European countries
Jari Haverinen, Raija Järvinen, Teemu Mustola, Petra Falkenbach

O-29 Compatibility of medical risk calculators with data from Finnish National Health Record System
Viljami Männikkö, Klaus Förger, Henna Urhonen

Sessio 6B: Digiratkaisujen näyttö käytännössä (session in Finnish)

Chair: Juhamatti Huusko, Finnish Society of Telemedicine and eHealth (FSTeH)

Invited speeches:

How Can We Evaluate the Evidence for Digital Health Solutions?
Associate Professor Paulus Torkki, University of Helsinki

What Are Our Experiences with Evaluating Digital Health Solutions?
Head of Assessment Petra Falkenbach, FinCCHTA, Pohde

Scientific rapid presentations:

O-30 Leveraging Digital Twin Technology for Healthcare: Mapping Potential Benefits and Impacts through a Hypertrophic Cardiomyopathy Case Study
Annariina Koivu, Mark van Gils, Antti Ahola, Jari Hyttinen

O-31 Participatory design in the development of a mobile application for the NFBC1966 follow-up study: initial steps in the STAGE project
Erika Jarva, Tiia Yrttiaho, Minna Isomursu

Corporate presentations:

Sensotrend

Laurea/ ETAPLATE

O-32 Value Co-creation and Co-destruction in Digital Health Services: Preliminary Findings of Systematic Review
Elina Laukka, Tuure Tuunanen, Miia Jansson, Minna Vanhanen, Nina Hirvonen, Jenni Palukka, Märt Vesinurm, Paulus Torkki

O-33 Ecosystem Supporting Commercialization of Digital Health Innovations
Pauliina Tryykilä, Elina Kontio

Corporate presentations:

Business Turku/ EDIH

MOKUVE - Multidisciplinary Rehabilitation Network

Länsi-Uudenmaan hyvinvointialue

11:30-12:30 Lunch (University Restaurant, 2nd floor) and exhibition

13:30-14:30 Session 7: Lesson learned in assessing the impact of digital services of health care (session in English)

Chair: Vesa Jormanainen, Finnish Society of Telemedicine and eHealth (FSTeH)

Health in the Digital Age
Eric Sutherland, Adjunct Professor, University of Victoria, Canada; Life Fellow, Royal Society of Medicine, UK; Director, International Society for Telemedicine and eHealth, Switzerland

Do we have evidence, if it is beneficial to organize health care services digitally?
Prof. Dr. Gro Rosvold Berntsen, Norwegian Centre for E-health Research, Tromsoe, Norway

Award ceremony & closing words
Outi Ahonen, Finnish Society of Telemedicine and eHealth (FSTeH)
Tuomas Koskela, Tampere University

Session 1: From research to impact in digital health and welfare services

Puheenjohtaja / Chair: President, Principal Lecturer Outi Ahonen

Torstai 14.11.2024 / Thursday 14th of November 2024

10:30 – 11:30

1-1 Finnish Society of Telemedicine and eHealth opening words

Outi Ahonen[1], President
Tuomas Koskela[2], Associate Professor
[1]Finnish Society of Telemedicine and eHealth; [2]Tampere University

1-2 Current and future impacts of AI on Health Care

Georg Dorffner, Associate professor
Medical University of Vienna, Austria

1-3 eHealth Award Ceremony

Outi Ahonen and Pirkko Kouri
Finnish Society of Telemedicine and eHealth

Current and future impacts of AI on Health Care

Georg Dorffner[1], **MS, PhD**
[1]*Medical University of Vienna*

Biograhpy of Georg Dorffner

Georg Dorffner is Associate Professor at the Institute of Artificial Intelligence, Center of Medical Data Science, Medical University of Vienna. He holds master's degrees in Computer Science and Communication Engineering from the Vienna University of Technology, as well as a PhD in Computer Science from Indiana University (USA). He has performed research in AI since the 1980s, when he was one of the Austrian pioneers in applying neural networks for both machine learning and as a cognitive model of language acquisition. In the 1990s, he received tenure ("Habilitation") for his work in applying novel types of neural network to data in medical applications. His research has strongly focused on signal and time series processing. In the early 2000s he founded the spin-off company The Siesta Group – serving as its CEO until 2014 –, which since its beginning has applied AI methods to the analysis of brain waves (EEG), in particular those during sleep (polysomnography and sleep staging). He is also one of the vice presidents of the Austrian Society of Artificial Intelligence (ASAI).

Background: Artificial Intelligence, while being a rather old idea dating back to the mid-20th century, has received tremendous attention after exhibiting several major breakthroughs in the past 10-15 years. These breakthroughs concern, among others, the achievement of expert-level performance in the automated interpretation of images or signals, and the remarkable capabilities of generative AI, such as large language models. Machine learning methods like neural networks – also first conceived several decades ago – are the main drivers behind those breakthroughs. Medicine as a field has been impacted extensively by those recent AI successes [1, 2] to a point where a potential redefinition of the main medical professions might be necessary.

Main content of the presentation: This presentation provides a brief overview of both the history of AI and the technologies behind its successes. It highlights a few examples – e.g. from dermatology, radiology or sleep medicine – demonstrating how AI already today impacts the way healthcare is being practiced. Yet much deeper impacts to healthcare can be expected in future, in particular, if and when AI will reach the level of "Artificial General AI" (or AGI, for short). [3] The presentation focusses.on the implications this might have on medical professions and their practice, and provides some arguments for discussion on which aspects of healthcare practice this will concern, as well as what further breakthroughs will be necessary on the way to AGI and a potential deep revolution in digital medicine.

Conclusion: This presentation attempts to make clear that AI is here to stay and will leave decisive marks in all main healthcare processes. Medical personnel will need to be properly prepared in terms of understanding the main capabilities, limits, as well as ethical implications behind the technology.

References:

[1] Esteva A, Kuprel B, Novoa RA, Ko J, Swetter SM, Blau HM, Thrun S. Dermatologist-level classification of skin cancer with deep neural networks. Nature. 2017 Feb 2;542(7639):115-118.
[2] Shieh A, Tran B, He G, Kumar M, Freed JA, Majety P. Assessing ChatGPT 4.0's test performance and clinical diagnostic accuracy on USMLE STEP 2 CK and clinical case reports. Sci Rep. 2024 Apr 23;14(1):9330.
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Finnish National eHealth Award

Finnish National eHealth award is delivered by President and Secretary of the Finnish Society of Telemedicine and eHealth.

The Board of Finnish Society of Telemedicine and eHealth delivers annually national eHealth award. The award is based on significant accomplishments in the field of telemedicine and eHealth. The required activity can be for example a doctoral thesis in this area or some other important activity in the national or international level supporting the society's goals. The award is delivered during annual Finnish national conference on telemedicine and eHealth. In the year 2024, Finnish national eHealth award is delivered for the 21st time.

Janne Lahtiranta PhD, Adjunct Professor – Product Development in Health Technology

Since the turn of the Millennium, Lahtiranta has worked extensively in the field of health technology. First steps in the field Lahtiranta took in EG&G Wallac (now Revvity) where he worked in quality assurance of analytical instruments. After a while, Lahtiranta joined ranks with Nowire Ltd., where his primary responsibilities revolved around Laboratory Instrument Interfaces (LIS) for analytical instruments in the role of Chief Technology Officer (CTO).

In 2004, Lahtiranta moved to Academia, starting his scientific work around personal health decision making, and Personal Health Records systems, which contributed to the creation of the first Finnish PHR, Taltioni, a predecessor to OmaKanta, and completion of Ph.D. thesis in 2014 that focused on challenges of personal health information.

After completion of his thesis, Lahtiranta shifted focus to health technology product development, co-creation, and interplay between industry, academia and health service providers. In this arena, Lahtiranta conducted most of his research, that granted in the title of Adjunct Professor (Docent) in the University of Turku (2024). His work in co-creation and health technology, provided Lahtiranta opportunities for working as a Professor of Practice in the University of Turku in two occasions (2018 and 2020). These opportunities gave much to his professional career in regional development organization, where his focus area has been the health technology, and pawing a way for Finnish companies to grow in the field, and for health service providers to renew their way of working.

Mariella Särestöniemi, Adjunct Professor

Mariella Särestöniemi has promoted the international visibility of Finnish digital health research by serving as the chair of the scientific committee for the international conference "First Nordic Conference on Digital Health and Wireless Communication, NCDHWS2024," held in Oulu on May 7-8, 2024, and by leading the editorial work for two books produced from the conference. The conference books have been published in the prestigious "Communications in Computer and Information Science (CCIS)" series by Springer and have been exceptionally published entirely as Open Access, effectively disseminating researchers' work in the eHealth/digital health field already during the conference. The books are openly accessible via the link https://link.springer.com/conference/ncdhws. The NCDHWS2024 conference was attended by over 260 experts from 24 countries, and the books contain a total of 90 scientific presentations, the selection and preparation of which has been a significant task alongside Särestöniemi's own research work.

In her research, Adjunct Professor Särestöniemi promotes interdisciplinary collaboration by working in both the Faculty of Technology and the Faculty of Medicine at University of Oulu. She is specialized in the use of wireless radio technologies in medicine and collaborates with several clinical partners. Her research aims to develop new technologies that could bring diagnostics to sparsely populated areas and, for example, to less developed countries through telemedicine. Särestöniemi regularly participates in conferences in the field and publishes not only in international publication series but also in the FinJeHeW journal. As of June 2024, she had a total of 85 peer-reviewed publications.

Session 2A: Artificial Intelligence

Puheenjohtaja / Chair: Mark Van Gils, Tampere University

Torstai 14.11.2024 / Thursday 14th of November 2024

12:30 – 14:00

2A-1 Collaborative Machine Learning for Healthcare

Samuel Kaski[1], Professor
[1]Aalto University and University of Manchester

2A-2 How could AI help the clinician?

Jussi Hernesniemi[1,2], Professor
[1]Faculty of medicine medical technology, Tampere University, Tampere, Finland; [2]Tays Heart Hospital, Tampere, Finland

Scientific rapid presentations:

O-1 Detecting Flow States in Gaming Environments Using Entropy-Based Features and Consumer-Oriented EEG Headbands

Matin Beiramvand[,1], MSc, Reijo Koivula[,1], MSc, Tarmo Lipping [1], PhD
[1]Faculty of Information Technology and Communication Sciences, Tampere University, Finland

O-2 Exploring robustness of a 12-leads arrhythmia classifier: A multi-database approach

Long Dang[1], PhD. Pedro A. Moreno-Sánchez[1], Mark van Gils[1]
[1]Medicine and Health Technology Faculty, Tampere University, Tampere, Finland

O-3 Clarifying the development phases and related regulation of predictive AI models for clinical decision-making: a framework proposal

Marketta Niemelä[1,2], PhD, Mpsych, Miikka Keski-Säntti[1], MSc, Katja Nolvi[1], MSc, Ira Haavisto[1], PhD, Tuukka Hakkarainen[1], MSc, Santtu Kivelä[1], MHS, Carina Dantas[3], MA, Miriam Cabrita[3], PhD, Riikka-Leena Leskelä[1], PhD
[1]Nordic Healthcare Group Ltd, Finland; [2]Tampere University, Faculty of Medicine and Health Technology, Tampere, Finland; [3]SHINE 2Europe, Lda Portugal

O-4 Risk management to health artificial intelligence applications

Alpo Värri, Dr. Tech
Faculty of Medicine and Health Technology, Tampere University, Finland

Corporate presentations:

- Business Turku / EDIH

Business Turku / EDIH

Collaborative Machine Learning for Healthcare

Samuel Kaski[1], Professor
[1]Aalto University and University of Manchester

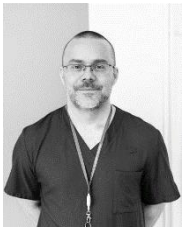
Biografia Samuel Kaski

Samuel Kaski is a Professor of Computer Science at Aalto University and Professor of AI in The University of Manchester. He leads the Finnish Center for Artificial Intelligence FCAI and ELLIS Unit Helsinki. His field is probabilistic machine learning, with applications in collaborative AI in computational biology and medicine, brain signal analysis, and user modelling.

How could AI help the clinician?

Jussi Hernessniemi[1,2], MD, PhD
[1]Faculty of medicine medical technology, Tampere University, Tampere, Finland; [2]Tays Heart Hospital, Tampere, Finland;

Biography Jussi Hernesniemi



Professor Jussi Hernesniemi is a researcher and a clinical cardiologist. He works in Tampere Heart Hospital and Tampere University leading the research group of Clinical Cardiology focusing on prediction and prevention of serious adverse events. He is the professor of cardiology in Tampere University. In clinical work Prof. Hernesniemi focuses on invasive diagnostics and treatments of patients with coronary artery disease. One of the primary research focuses of Prof Hernesniemi's team is the use of large datasets and different complex machine learning methods to predict the most severe complications of cardiovascular diseases such as stroke and sudden cardiac death.

Main content of the presentation: Artificial intelligence and complex algorithms for data analysis will change clinical work. They can provide good and bad tools for the clinicians. It is vital that both sides – the technicians providing the analytical tools and physicians – understand what the strengths and pitfalls of AI and the data accrued in health care. The purpose of this lecture is to provide concrete examples on how AI could help the clinician in day-to-day work and what issues should be addressed when designing new innovations to improve diagnostics and patient selection for interventions.

O-1: Detecting Flow States in Gaming Environments Using Entropy-Based Features and Consumer-Oriented EEG Headbands

Matin Beiramvand[1], MSc, Reijo Koivula[1], MSc, Tarmo Lipping [1], PhD
[1]*Faculty of Information Technology and Communication Sciences, Tampere University, Finland*

Introduction: The flow state is characterized by a sense of being immersed in the task and actions seem to occur seamlessly and automatically [1]. Several studies have reported the phenomenon to be a motivator, a skill-developer, and an improvement in performance. Only recently have researchers begun to investigate the neural correlates of this intriguing phenomenon. While the flow state can be measured using brain imaging techniques [1], electroencephalography (EEG)-based systems provide a more practical alternative due to their simpler configuration and broader availability. Furthermore, recent advancements in user-friendly commercial EEG devices have opened new opportunities to capture the flow state in a real-life environment. Despite these advancements, consumer-oriented EEG devices have not been extensively explored in the literature for capturing the flow state. In this study, we aim to develop a low-channel method for detecting the flow state using consumer-oriented EEG devices available on the market [2].

Material and Methods: Video games, especially Tetris, have become popular tools for studying mental states like the flow state. In this study, participants played Tetris at three different difficulty levels (easy, moderate, and hard) to identify the level that best matched their abilities and induced a flow state. After determining the appropriate difficulty level, each participant played Tetris three times for five minutes each at their selected level, with a one-minute relaxation break between the sessions. A total of 11 subjects participated in the study. EEG signals were recorded using the Muse-S EEG headband, which is equipped with textile electrodes positioned at AF7, AF8, TP9, and TP10. For the analysis, signals from the AF7 (Ch1) and AF8 (Ch2) derivations were used, with the reference electrode located at Fpz. After recording the EEG signals, a Butterworth bandpass filter with a passband of 0.5 to 40 Hz was applied to eliminate noise. Eye blink artifacts were removed using the discrete wavelet transform (DWT) method. The preprocessed signals were divided into 1-minute segments, covering both the relaxation period and the first to fifth minutes of each game session. This ensured that each game segment matched the duration of the relaxation period, allowing for the assessment of the evolving state of brain activity throughout the 5-minute game sessions. These segments were then further divided into 10-second epochs and decomposed into subbands using DWT. Slope entropy (SlopEn), Spectral entropy (SpecEn), and Dispersion entropy (DispEn) were extracted from each EEG subband. Each feature extracted from the cleaned data was normalized to a range between 0 and 1 then input into a Random Forest (RF) classifier to classify the signals into flow and relaxation states.

Results: The normalized features were fed into a RF classifier to distinguish between different game segments and relaxation periods within a session, aiming to identify patterns in feature variations throughout the recording. The RF classifier achieved accuracies of 88.85% and 89.50% for the first two minutes, respectively. The flow state deepened, with accuracy exceeding 91.17% during the third minute of the game. Notably, the fourth minute of gameplay was identified as the period during which the deepest flow state was observed across all subjects, achieving an accuracy of over 92.50%. However, the classifier's accuracy decreased to 86.28% during the fifth and final minute of the game.

Discussion: Compared to state-of-the-art methods [2,3], the entropy-based features of the proposed approach yielded promising results, achieving superior evaluation metrics. Furthermore, by distinguishing between game segments and relaxation periods, the findings suggest that the proposed feature set is effective in identifying flow states within each game segment. This study confirms the feasibility of detecting the flow state using a low-channel, consumer-oriented EEG headband, which holds promise for applications in real-life settings and gaming environments.

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O-2: Exploring robustness of a 12-leads arrhythmia classifier: A multi-database approach

Long Dang[1], PhD. Pedro A. Moreno-Sánchez[1], Mark van Gils[1]
[1]Medicine and Health Technology Faculty, Tampere University, Tampere, Finland

Introduction: The traditional early-diagnosis of arrhythmias based on the electrocardiogram (ECG) requires significant medical expertise. Detecting abnormalities from ECGs is often challenging and prone to errors, especially in complex cases. Machine Learning (ML) and Deep Learning (DL) have shown promising results in automating arrythmia detection through unveiling certain features in ECG signals that allow achieving high accuracy. However, most studies rely on a single database to train and test the ML/DL models, leading to significant variations in performance when applied to unseen data from different databases. This lack of robustness issue can be mitigated by using multiple databases during the different phases of model development, i.e. training, validation and testing. This paper investigates the robustness of a DL 12-leads ECG arrhythmia classifier by analyzing its performance across various database combinations.

Material and Methods: We utilized a previous developed ECG arrhythmia classifier [1] based on a ResNet34 architecture that processes annotated 12-lead ECG recordings from the China Physiological Signal Challenge 2018 (CPSC2018). It includes 6,877 recordings sampled at 500 Hz ranging from 6 to 60 seconds. Our multimodal approach also incorporates other public databases such as the extra CPSC2018 with an additional 3,453 recordings, the public electrocardiography dataset (PTB-XL) with 21,837 recordings and a scientific research database contributed by Chapman University et al., which provides 10,247 ECG recordings, all of them accessible via the PhysioNet Challenge site [2].
The arrhythmia categories considered in the first three databases are atrial fibrillation (AF), intrinsic paroxysmal atrioventricular block (I-AVB), left bundle branch block (LBBB), normal heartbeat (SNR), premature atrial contraction (PAC), premature ventricular contraction (PVC), right bundle branch block (RBBB), ST-segment depression (STD), and ST-segment elevation (STE). The Chapman database includes all categories except PVC, which influences the approaches defined for the robustness analysis. These categories are not evenly distributed in the datasets, leading to an underrepresentation of certain categories in the database (i.e. STD, or STE).
Thus, two approaches are considered as follows: i) develop an 8-class arrhythmia classifier implementing a hold-out strategy with training/validation set (80/20 ratio) using CPSC2018, CPSC2018 extra and PTB-XL, and an independent testing set using the Chapman dataset; ii) develop a 9-class arrhythmia classifier adopting the same hold-out strategy, but with PTB-XL is used for training and validation, and CPSC2018 and CPSC2018 extra for testing. The performance of these two approaches is compared with the original approach, which used only CPSC2018 for training and testing.
Prior training the models, a data curation process was conducted to filter instances that contained at least one of the 9 arrhythmia categories. As a result, the sizes of the CPSC2018, PTB-XL, and Chapman databases were reduced to 18%, 93%, and 45% of their initial sizes, respectively.

Results: The results indicate that, based on the evaluation of the average Area Under the Receiver Operating Characteristic (AUROC) the classifier for the 08-class approach experiences a slight decrease in performance achieving an AUROC value of 0.873 (compared to the original model's 0.902). For the 9-class approach, the difference is more significant with a AUROC of 0.850 (original model 0.983). By inspecting the performance for individual categories in the 8-classes approach, LBBB, STD and STE showed the largest performance drops in the test set. In the 9-classes approach, all the categories exhibited performance decrease in both the training and test set, with more pronounced declines in SNR, IAVB, RBBB, PAC, STD and STE.

Discussion: This study reveals performance variations when using different independent datasets for the model development. As shown with the 8-class approach, using multiple independent datasets for training helps mitigate the decrease in performance, resulting in a more robust model for classifying unseen data. Additionally, the high imbalance of arrythmia categories observed in 9-class approach significantly affects the classification performance, with categories having fewer instances experiencing a greater decrease.

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O-3: Clarifying the development phases and related regulation of predictive AI models for clinical decision-making: a framework proposal

Marketta Niemelä[1,2], PhD, Mpsych, Miikka Keski-Säntti[1], MSc, Katja Nolvi[1], MSc, Ira Haavisto[1], PhD, Tuukka Hakkarainen[1], MSc, Santtu Kivelä[1], MHS, Carina Dantas[3], MA, Miriam Cabrita[3], PhD, Riikka-Leena Leskelä[1], PhD
[1]Nordic Healthcare Group Ltd, Finland; [2]Tampere University, Faculty of Medicine and Health Technology, Tampere, Finland; [3]SHINE 2Europe, Lda Portugal

Introduction: Regulation is a key point for implementation of medical Artificial Intelligence (AI) solutions, but AI researchers and developers may perceive these areas as a too difficult, unclear or effortful task to be considered early in the development. To support compliance with legislation, we propose a framework that clarifies the development phases of predictive AI models and the related European Union (EU) regulation in each phase. Beckers & al. [1] have considered the role of EU Medical Device Regulation (MDR) in medical AI development in four phases: 1) early considerations (e.g., intended use), 2) design and development of the model and clinical studies, 3) the regulatory submission phase and 4) the post-market surveillance period. The study purpose was to support medical professionals to comply with the MDR when taking AI into use. Also, Larson & al. [2] identified four essential development phases of a diagnostic AI software development. The purpose of the phases is to increase the feasibility, capability, effectiveness and durability of the software. The authors provided recommendations for stakeholders' actions in each phase to overcome certain gaps in the major regulatory frameworks to improve development and evaluation of diagnostic AI algorithms.
Our proposed framework extends the earlier work in four ways. First, it illustrates in a table format the phases when an AI model should be tested or evaluated, from laboratory settings to the market. Second, the framework is built on the software development phases similar to [2] but extends from that to present the important phases of clinical validation and clinical evaluation. Third, the framework points out critical aspects that influence the regulation that should be considered in each phase (e.g., patient involvement). This should help AI developers to better adopt the logic of regulation and its requirements. Fourth, the framework takes in consideration includes three central EU legislations: the MDR, the General Data Protection Regulation (GDPR) and the AI Act. The framework is work-in-progress research.

Material and Methods: The framework has been drafted in the EU RadioVal project (GA No 101057699) developing a clinical AI model to predict a breast cancer patient's medical response to neoadjuvant chemotherapy treatment [3]. The AI model, trained with clinical, imaging and other patient data, will be validated in eight clinical organisations in three continents. The project engages various stakeholders and implements the Future AI metrics. Regulatory issues are considered relating to the AI model development and clinical validation as well as exploitation in an international context. To support the clinical validation work, we have developed the framework based on the literature [1,2] and feedback from the project consortium.

Results: The framework consists of six phases: 1. Lab testing, 2. Evaluation in a test environment, 3. Evaluation in a customer test environment, 4. Evaluation in real-world, 5. Evaluation in real-world use, 6. Post-market surveillance. In each phase, the framework addresses the level of control in the evaluation setting, the involvement of various users and operators of the algorithm, the physical test setting, the risk to the patient, and related regulation. In addition, the framework suggests at what stage the developers should proceed with the clinical evaluation plan, depending on the results that can be expected from the clinical study.

Discussion: This type of framework can support medical AI development stakeholders to communicate with shared terminology and to better understand the development phases as well as to consider the relevant regulation early enough. This is important to avoid additional effort or developmental dead ends due to incompatibility with legislation. We would like to initiate the discussion on the suggested framework to validate and develop it further.

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O-4: Risk management to health artificial intelligence applications

Alpo Värri[1], Dr.Tech
[1]Faculty of Medicine and Health Technology, Tampere University, Finland

Introduction: The interest in applying artificial intelligence (AI) in health applications has increased, particularly after the awareness of its potential has become widely known through the popularity of the publicly available large language model applications such as ChatGPT and Gemini. AI can be applied to both medical devices and other applications in the health sector, for example in work shift staff planning. In the USA, the Food and Drug Administration has approved around 950 AI-enabled medical devices to the market by August 2024 [1]. The failure of an AI-enabled medical device can have fatal consequences whereas the consequences of non-medical device AI systems could be only financial. For this reason, the management of risks in the medical device AI systems needs to be on a higher level than in other health AI applications.
The European Union (EU) has approved the AI Act for the trustworthy use of AI in the EU [2]. Its article 9 requires a risk management system to be set up on high-risk AI systems. The manufacturer of an AI system should carefully study the rules how the systems are classified as high risk. The general rule is that the system poses a high risk of harm to the health and safety or the fundamental rights of persons [2]. To give more detailed instructions about how the risk management should be carried out, the EU Commission made a standardisation request [3] to the standardisation organisations CEN and CENELEC in 2023 to draft standard(s) on AI risk management. The purpose of this paper is to assess how the ongoing work affects health information systems.

Material and Methods: The CEN&CENELEC Joint Technical Committee 21 (JTC21) has begun the work on the AI risk management standard by holding a series of meetings and studying several existing documents about AI and risk management, in addition to the AI Act to which the final standard should be harmonised. In addition to the standard, the collection of a risk catalogue has been started. The documents produced by the committee and the discussions have been followed from the health informatics point of view concerning the implications to health information systems.

Results: The discussions have indicated that the view of the EU Commission about AI risk management is close to the line of thinking in the ISO 14971 standard for risk management to medical device manufacturers. The AI specific risks related to data, e.g. bias in the training material, transparency, and risks related to the sufficient human oversight of the AI system are additional risks to be managed by the medical device manufacturers compared with non-AI medical devices. The risks related to fundamental rights have turned out to be more difficult to manage. For example, it is difficult to define what is an acceptable level of residual risk which remains after risk mitigation actions have been put in place.

Discussion: The JTC21 work is horizontal, applying to all sectors of the society, not only the health sector. It is important that the health sector representatives participate in this work, too, so that the results are feasible also to the health sector. When the ideas are close to that of ISO 14971, the applicability looks promising. The additional risks related to data, transparency and human oversight can relatively easily be managed by engineering skills. In addition to the JTC21 work, there is work going on in ISO/TC210 to draft a standard describing how the ISO 14971 standard should be applied to medical devices applying AI.
The more difficult part is clearly the formulation of the risk management of the fundamental rights of the citizens to a risk management standard. The implementers of the standards are typically software engineers who need a clear list of requirements for the systems they are about to implement. The rights to health services in a medical triage system may be in the easier end of the scale but there are more difficult cases, too. For example, it may be difficult to describe in engineering terms what AI software requirements result from the requirement to consider risks concerning human dignity. This problem related to the risks to fundamental rights has also been recognized by Gornet and Maxwell [4].

References:

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Session 2B: Digitaaliset vastaanotot (Session in Finnish)

Puheenjohtaja/Chair: Tuomas Koskela, Tampereen yliopisto

Torstai 14.11.2024 / Thursday 14th November 2024

12:30 – 14:00

2B-1 Digitaaliset vastaanotot perusterveydenhuollossa / Digital receptions in primary health care

Kaisa Kujansivu, Chief Medical Officer and Doctoral Researcher
Terveysasemapalvelut Pihlajalinna Oy ja Tampereen yliopisto

2B-2 Käytännön kokemuksia etävastaanotoista Pirkanmaalta / Experiences of remote receptions in Pirkanmaa

Aino Nokelainen, Project Manager
Pirkanmaan hyvinvointialue

Scientific rapid presentations:

O-5: Experiences of Using Digital and Remote Health Services to Support Work Ability: A Qualitative Interview Study

Elina Kervinen[1] MHSc, Lauri Vähätalo[1] MSc, Anna Siukola[1] PhD, Tiia Reho[1,2] MD, PhD, Klas Winell[3,4] MD, PhD, Riitta Sauni[1] MD, PhD
[1]Tampere University, Faculty of medicine and health technology, Arvo Ylpön katu 34 (33520 Tampere) PL 100 33014 Tampereen yliopisto, Finland; [2]Pihlajalinna, Kehräsaari B, 33200 Tampere, Finland; [3]Conmedic Oy, Antaksenkuja 3, 02330 Espoo, Finland; [4]Turku University, Kansanterveystiede, 20014 Turun yliopisto, Medisiina A, Kiinamyllynkatu 8–10, 20520 Turku, Finland

O-6: Developing digital services for assessing diet quality, having automated feedback, and getting support for dietary changes: Ravitsemusnavigaattori & Ravitsemuspolku

Elina Järvelä-Reijonen[1], PhD, RD, Jesse Honkanen[2], MSc, Kirsikka Aittola[1], MSc, RD, Iiro Välimaa[2], Beng, Henna Lehikoinen[2], MSc, RD, Maria Lankinen[1], PhD, RD, Marjukka Kolehmainen[1], PhD, RD
[1]Institute of Public Health and Clinical Nutrition, University of Eastern Finland, Kuopio, Finland
[2]Savonia University of Applied Sciences, Kuopio, Finland

O-7 The effectiveness of exergaming (YetiHome®) versus traditional exercise for older people mobility and balance: protocol of the randomized intervention trial

Sari Arolaakso[1], M.Sc, Physiotherapy, Lecturer, PhD-student, Sinikka Lotvonen[2], PhD, Postdoctoral Researcher, Satu Elo[3], PhD, Adjunct professor, Principal lecturer
[1]Lapland University of Applied Sciences, GeroNursing Center, Research unit of health sciences and technology, University of Oulu, [2]GeroNursing Center, Research unit of health sciences and technology, University of Oulu, [3]Oulu University of Applied Sciences, University of Oulu

O-8 Establishing the Remote Consultation Working Group of the Finnish Society of Telemedicine and eHealth: Towards Best Practices

Paula Veikkolainen[1,2], Marja Nieminen[3], Mika Fiskari[3], Kaisa Kujansivu[4], Mikko Vesamäki [4], Sanna Pesonen[5], Eero Latva-Rasku[6], Jouni Turunen[7], Aleksi Schrey[8]
[1]Research Unit of Health Sciences and Technology, University of Oulu, Finland [2]Terveystalo, Finland; [3]Western Uusimaa Wellbeing Services County, Espoo, Finland; [4]Pihlajalinna, Finland; [5]Finnish Institute of Occupational Health, Finland; [6]Mehiläinen, Finland; [7]Sencom Oy, Finland; [8]Finnish Student Health Service, Finland

Corporate presentations:

- MOKUVE – Multidisciplinary Rehabilitation Network
- Nuanic Oy
- SMARTmedi Oy

Digitaaliset vastaanotot perusterveydenhuollossa
Digital receptions in primary health care

Kaisa Kujansivu[1,2,3], MD
[1]Faculty of Medicine and Health Technology, Tampere University; [2]Pihlajalinna Oy; [3]Finnish Institute of Health and Welfare – THL

Biography Kaisa Kujansivu

Kaisa Kujansivu is a doctoral researcher at Tampere University and is working on a thesis on remote consultations in primary health care. She is a specialist in general practice and working as a chief medical officer in Pihlajalinna eHealth Unit and Health Care Services. Her main focus is on public health care.

Background: Digital services have increased rapidly in Finnish healthcare in recent years. Different digital services are hoped to ease struggling health care with inadequate resources and increasing demand. In Finland, smaller health care centres are being shut down, and services shifted to mobile and digital services. Digital services could provide health care services to rural areas, but the research evidence is partly controversial, whether the patients in rural areas use these services. In addition, not every issue is suitable for digital consultations, and patient safety and continuity of care should not be overlooked. Furthermore, services extending access to general practice across longer hours means faster access to care but may generate additional demand and add on costs [1,2,3,4]

Main content of the presentation: In this presentation, recent research findings on remote and digital consultations are discussed. The main focus is on the findings of systematic reviews of remote/digital consultations. This presentation contains professionals' and patients' points of view, description of users of digital clinics, and the most suitable problems for digital consultations.

Recommendation for future research: Further research is still needed on the effectiveness of digital consultations so that we can define more efficiently how to arrange digital services in primary health care. It is important that continuity of care is maintained and consultations are kept safe for the patients. In addition, the workload of the professional should not be excessively increased.

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Käytännön kokemuksia etävastaanotoista Pirkanmaalta
Practical experiences of the remote receptions in Pirkanmaa

Aino Nokelainen[1], MSc (health sci.), RN
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Biography Aino Nokelainen

Aino Nokelainen is a Project Manager in the Digital Development Unit of the Pirkanmaa Wellbeing Services County, where she promotes innovative projects for the development and smooth implementation of digital services. She holds a Master of Health Sciences degree and is a Registered Nurse (YAMK). Throughout her career, Aino has worked as a specialist nurse in specialized healthcare, developing both local and national practices. Since 2022, she has been actively involved in the preparation of the wellbeing services county, focusing particularly on the development of digital services. She has played a key role in several significant implementation and development projects that have improved the accessibility and quality of services.

Background: The Wellbeing services county of Pirkanmaa is the largest one in Finland, consisting of 23 municipalities. Population of Pirkanmaa is almost 540 000 and growing. The development of digital services is strongly described in the strategy of the Wellbeing services county [1]. In the early stages of the social and health care reform, the region had almost 1000 separate digital solutions and numerous different patient and customer information systems. Preparations for digital services targeted at the residents started in autumn 2022 [2]. Remote consultations may take the form of chat and video consultations. These services are widely used in social and health services.

Main content of the presentation: The development and expansion of remote receptions started in 2023 at the level of the county of Pirkanmaa. In the first phase, remote receptions were implemented in the nurse and doctor functions of the health centres and in primary care. In the next phase, remote consultations were introduced in the social services, in the counselling services and in the health services. In May 2024, the wellbeing county of Pirkanmaa launched the Digital clinic, which transformed the remote consultations. In early November 2024 The Digital Clinic has over 100 000 conversations. Remote consultations in the wellbeing area are carried out either via the website embedding or Digital clinic app or browser version or via the OmaTays portal for specialized healthcare. Residents of the Wellbeing Area will be directed to the strong authentication services via the OmaPirha login. The population of the region is highly digitally literate and interested in organizing, with more than 230 000 people already logged in to OmaPirha. The 2024 digital agenda has been described by the phrase “digital for all”. Accessibility, usability and smooth navigation to digital services are at the core and digital support is widely available when needed. The number of remote perceptions is steadily increasing**.** The number of video visits has increased by 6% compared to the previous year in social and health services in primary care. The number of video consultations in the welfare area in 2024 is around 13 000. Estimates for the first three quarters of 2024 show an increase of up to 380% in the number of chat sessions compared to 2023, mainly due to the opening of the digital clinic. Without the digital clinic, the increase in Pirha chat placements was 102% compared to the same period last year. It is worth noting that the use of Pirha’s chatbot Pirbotti has increased by more than 120% in a year, with more than 90 000 chats this year. It is clear that the number of the remote perceptions is expected to increase in the future and the range of uses to expand in the future. There is a need for guidance and support for professionals, effective telehealth tools and digital solutions, and good practices to promote smooth and secure teleworking. Clients’ own digital equipment is evolving and more and more people are able to connect to remote working with their own devices. Positive experiences of remote consultations by residents and professionals will support this growth. There is also a need for concrete help to join remote consultations, which is possible in many welfare areas, municipalities and organizations.

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O-5: Experiences of Using Digital and Remote Health Services to Support Work Ability: A Qualitative Interview Study

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Introduction: The primary objective of occupational health care is to support the work ability of employees, in collaboration with workplaces [1-2]. Nevertheless, the utilisation of digital and remote health services for this objective has been studied only a little. The objective of our research is to address this gap in the literature by providing new insights into the topic.

Material and Methods: This study examined the experiences of occupational health care professionals and human resources (HR) representatives from client companies regarding the use of digital and remote health services in supporting work ability. The data was collected through interviews with 26 occupational health professionals from a service provider in Finland and 16 HR representatives from client companies. The data was analysed using inductive content analysis [3].

Results: The findings indicate that digital and remote health services can be utilised effectively across various stages of work ability support in occupational health care settings. For instance, applications designed to identify potential work ability risks can assist in determining the necessity for support and enhancing the monitoring process. Nevertheless, the efficacy of these instruments appears contingent upon the proficiency and dedication of the users. The simplification of user interfaces, improvement of usability, and provision of adequate user training and support can facilitate the adoption and efficacy of these services. Furthermore, digital and remote health services can enhance access to treatment, thereby accelerating the commencement of work ability support, particularly in instances pertaining to mental health. Furthermore, clients may feel more comfortable talking their work ability in remote receptions. Nevertheless, digital and remote health services are not without their own set of challenges, including the experience of distance and the potential for interactions to be perceived as superficial. Furthermore, occupational health care professionals in remote receptions may encounter difficulties in forming an overall picture due to the potential absence of non-verbal communication. Digital and remote health services can facilitate the initiation of work ability support processes, yet there are instances where in-person consultations remain indispensable.

Discussion: The development of digital and remote health services is contingent upon the expertise of occupational health clients and professionals, their heterogeneous needs, and willingness to adopt digital solutions. A comprehensive set of occupational health care services that considers the aforementioned aspects and combines digital, remote and face-to-face services may prove the most effective means of supporting work ability. This approach could also have broader societal benefits.

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O-6: Developing digital services for assessing diet quality, having automated feedback, and getting support for dietary changes: Ravitsemusnavigaattori & Ravitsemuspolku

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Introduction: Nutrition is one of the most important factors in the prevention of noncommunicable diseases. However, only a few Finns eat according to the nutrition recommendations. In the Finnish healthcare setting, there is no commonly used, scientifically validated, digital dietary screener tool to measure diet quality.

Material and Methods: We are developing (a) a digital tool to measure diet quality based on the validated Finnish Healthy Diet Index (HDI) [1], (b) automated personalized feedback system about the quality of diet based on the HDI scoring and nutrition recommendations, and (c) a website for a self-care path to support the individual in making dietary changes. We utilize service design and feedback from several focus group interviews, usability tests, feedback questionnaires, and expert interviews. Pilot testing will be conducted as part of the work of municipal sports coordinators and occupational healthcare professionals. The services are created by nutritionists and technical experts. The work is part of the National and the North Savo regional FOODNUTRI projects funded by Research Council of Finland and North Savo Regional Council, co-funded by the European Union.

Results: The Ravitsemusnavigaattori (Finnish Nutrition Navigator) [2] and the Ravitsemuspolku (Finnish Nutrition Path) [3] will be launched in Nov 2024 (in Finnish). The services will be publicly available for everyone at no cost. They can be used independently or with a professional. The professional can guide the patient to fill in the dietary questionnaire in the Ravitsemusnavigaattori from which the user will get the automated feedback and a code. The patient can give the code to the professional so that the information about the diet quality can be utilized and marked to the electronic health record in a standard form. The user can utilize the self-care path Ravitsemuspolku for personal dietary changes independently or with the professional.

Discussion: The digital services (dietary screener tool, automated feedback, and self-care path) will support (a) consumers seeking for help with their diet and (b) primary and occupational healthcare professionals' work with patients/customers at risk or with diagnosis of chronic diseases. The digital services will support professionals with diverse background of nutrition education in assessing the quality of diet and in nutrition counseling. Furthermore, using the services would standardize dietary assessment and documentation in healthcare. The services are made user-friendly by utilizing the user experiences of both professionals and patients/customers.

In the future, the dietary data collected through Ravitsemusnavigaattori can be used to study the effectiveness and cost-effectiveness of nutrition and lifestyle counseling, allocate resources in health care, and support work with counties' wellbeing accounts and plans to promote health and wellbeing.

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O-7: The effectiveness of exergaming (YetiHome®) versus traditional exercise for older people mobility and balance: protocol of the randomized intervention trial

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Introduction: The mobility problems of older people are often related to the decrease of functional capacity and health [1], weakened physical condition, attitude to life and fear of falling [2]. Relatively little research has been done on the possibilities and effectiveness of exergaming on the mobility of old people. Interventions that include exergaming have been found to motivate and increase commitment to rehabilitation [3], to improve mobility, balance [4], performance in daily activities and independence [5]. The aim of randomized intervention trial is to find out the effect of physical exercises performed on the technological device (YetiHome®) on identified preclinical movement problems during a 2-month follow-up period. The goal is to produce information about the effectiveness of gamified physical exercises in preventing movement problems and supporting older people living at home.

Material and Methods: Study is the randomized intervention trial. The target group is over the age of 75 old people, who are not covered by social and health services and who have received a preventive home visit. The study is a quantitative intervention-based follow-up study. The intervention groups consist of people who have been found to have preclinical mobility problems during a preventive home visit. In the first stage, the functional capacity data is collected during preventive home visits with a structured questionnaire. Data collection of functional capacity utilizes the structured questionnaire (HEKO-tool), whose functional assessment targets are bridged to the ICF classification (International Classification of Functioning, Disability and Health). Data is collected on everyday activities as well as mental-wellbeing, social-wellbeing and risk of falls. In the second phase, the physical performance was assessed by a One-Leg Balance test (OLB) and Short Physical Performance test (SPPB) combined with a mobile solution developed to measure balance, AinoneBalance. The AinoneBalance application utilizes Romberg's standardized test. The participants were randomized into a game group (n=14) and a control group (n=14). The gaming group received a YetiHome® device at home and instructions for the traditional exercise. The control group only received instructions for the traditional exercise.

Results: The results of the study will be reported later after the implementation of the intervention.

Discussion: Adding technological and game-based solutions to the implementation of preventive home visits for the older people will accelerate the collection and utilization of assessment data for detecting preclinical mobility problems in the older people, supporting survival at home, and developing various regional services.

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O-8: Establishing the Remote Consultation Working Group of the Finnish Society of Telemedicine and eHealth: Towards Best Practices

Paula Veikkolainen[1,2], Marja Nieminen[3], Mika Fiskari[3], Kaisa Kujansivu[4], Mikko Vesamäki [4], Sanna Pesonen[5], Eero Latva-Rasku[6], Jouni Turunen[7], Aleksi Schrey[8]

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Introduction: The Finnish Society of Telemedicine and eHealth (FSTeH) a nonprofit organisation and scientific society with the purpose of promoting public health and the dissemination of medical expertise through information and communication technology. One of the society's primary goals is to foster education and development in the field of telemedicine and eHealth. [1] Remote consultation, a specific form of telemedicine, means consultation between the patient and professional via electronic or other non-face-to-face interaction [2]. The use of remote consulting services has seen significant growth, especially during the COVID-19 pandemic [3]. While remote consultations have proven to be an effective way to deliver healthcare services, their success depends on careful implementation that addresses their unique characteristics [4].

Material and Methods: In response to the increasing number of remote consultations services, FSTeH wanted to establish a Remote Consultation working group focused on serving as a discussion forum, providing training, and acting as a guide for professionals in the best practices of remote consultations. In the spring of 2024, the board of FSTeH invited interested members to participate in the working group's activities.

Results: The Remote Consultation Working Group is composed of professionals with backgrounds as doctors, nurses, and corporate sector specialists. The group aims to develop more detailed practical guidelines for remote consultations at the national level, implement these guidelines in practice and to advance education in the field, for example, through webinars, statements and training days. In the summer of 2024, the Finnish Medical Convention approved the working group's course proposal, 'Everything a Doctor Needs to Know About Telemedicine', for its 2025 program.

Discussion: Remote consultations are a specialized form of healthcare service that requires clinical experience and specific communication skills. Training professionals in these areas is considered essential to ensure safe and high-quality remote consultations [4]. However, not all cases are suitable for remote consultations, and digital services should complement, rather than replace, other healthcare services. The goal should not be digitalization without added value. The Remote Consultation Working Group of FSTeH is dedicated to addressing this training need. The group has already begun its work on the topic and continues to make progress from a multidisciplinary perspective. It remains open to new FSTeH members who are interested in remote consultation practices and eager to contribute to its national development.

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Session 3A: CyberSecurity and Regulations (session in English)

Chair: Alpo Värri, Tampere University

Torstai 14.11.2024 / Thursday 14th of November 2024

14:30 – 16:00

3A-1 The impact of new and upcoming cybersecurity regulations

Ben Kokx[1], Director Standardization Product Security
[1]Philips, The Netherlands

3A-2 Acute cyber security situation in Finnish healthcare and long-term recommendations

Perttu Halonen[1], Senior specialist
[1]*National Cyber Security Centre Finland*

Scientific rapid presentations:

O-9 Feasibility of Synthetic Tabular Data for the Research and Development of Clinical Decision Support with Ischemic Stroke Use Case

Aysen Degerli1, Harri Pölönen1, Juha Pajula[1], Miikka Kivioja[1], Aino-Lotta Alahäivälä[1], Arho Virkki[2]
[1]VTT Technical Research Centre of Finland, Finland; [2] Auria Clinical Informatics, Finland

O-10 Secondary use of health care data and needed competencies

Sari Räisänen[1], PhD, Kristina Helminen[1], PhD, Jyri Rajamäki[1], PhD, Maria do Carmo Gomes[2], PhD, Outi Ahonen[1], PhD
[1]Laurea University of Applied Sciences, Finland; [2]ISCTE – University Institute of Lisbon, Portugal

O-11 Information and Data Management on Planetary Health and Wellbeing within Transatlantic Ecosystem Model

Laura Tahvanainen[1,2], MHc, PhD candidate, Birgitta Tetri[1,3], M.Soc.Sc., PhD candidate, Outi Ahonen, PhD [1]
[1]Laurea University of Applied Sciences, [2]University of Lapland, faculty of Art and Design, [3]University of Helsinki

Corporate presentations:

- Business Turku / EDIH

The impact of new and upcoming cybersecurity regulations

Ben Kokx[1]
[1]Philips, Netherlands

Biography Ben Kokx

Ben Kokx is a healthcare and IoT security expert who leads and participates in many industry associations, standard development organizations and public-private partnerships at European, American, and international level. Ben is the chair of the cybersecurity focus group of MedTech Europe and chair of the Security and Interoperability working group of COCIR. Ben has over twenty-two years of product security experience within Philips where he for the past ten years was responsible for the Philips global Product Security Policy and Process Framework. Currently he is dedicated to his regulatory and standards activities where he spent most of his time as convenor of the CEN/CENELEC workgroups developing the harmonized standards for the RED Delegated Regulation [1] and the Cyber Resilience Act[2].

Background: In an increasingly connected world, cybersecurity related threats emerge which can have an impact on human health and public health. Policy makers are addressing their concerns with a rapidly increasing number of different regulations targeting organizations, services and products. Within Europe this happens at European, national and even state levels, which is causing a patchwork of obligations.

Main content of the presentation: This presentation provides an overview of the obligations and interplay on some of the new and upcoming European cybersecurity related regulations that have an impact on the healthcare sector. The new NIS2 [3] and the CER [4] impacts both hospitals and their suppliers. Next to these more organizational regulations the cybersecurity requirements for products are also further enforced via the RED Delegated Regulation [1] and Cyber Resilience Act [2] which will regulate all software and hardware. Although MDR/IVDR products are exempted from these product regulations, the European Parliament just requested the European Commission to assess and come up with new delegated and implementing acts to address MDR/IVDR issues [5], of which we know that an important topic in Brussels is the cybersecurity of hospitals and healthcare providers [6].

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[3] Directive (EU) 2022/2555 of the European Parliament and of the Council of 14 December 2022 on measures for a high common level of cybersecurity across the Union, amending Regulation (EU) No 910/2014 and Directive (EU) 2018/1972, and repealing Directive (EU) 2016/1148 (NIS 2 Directive).
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Acute cyber security situation in Finnish healthcare and long-term recommendations

Perttu Halonen[1], MSc (tech.)
[1]The National Cyber Security Centre Finland, Finnish Transport and Communications Agency Traficom

Biography Perttu Halonen

Perttu Halonen works at the National Cyber Security Centre in Finnish Transport and Communications Agency Traficom as a health and social welfare sector specialist. His tasks include forming and maintaining relations to actors in the sector, and forming national cyber situational awareness on the sector.

Introduction: Cyber security is nowadays seen as an essential quality aspect of healthcare.[1] However, many healthcare professionals feel that they don't have the necessary skills to properly handle cyber threats in their work.[2] Is their concern well-founded? How important is the competence of individual employees for a healthcare providers' cyber security? Are healthcare organisations on top of the situation?

Material and Methods: We studied the state of cyber security in Finnish healthcare delivery organisations at the moment by comparing the statistics compiled by European Union agency for cybersecurity ENISA[3] with statistics of incidents reported to the National Cyber Security Centre Finland (NCSC-FI). Based on information shared in Finnish confidential cyber security cooperation groups, we analysed how Finnish healthcare providers manage their cyber risks at the moment. Tero Haukilehto's doctoral thesis sheds further light on how cyber security is managed in Finnish healthcare.[4]

Results: Healthcare professionals are largely lacking sufficient training and clear guidelines for preventing cyber security incidents and for actions in case of an incident. Still, incident statistics suggest that cyber security is better under control in Finnish healthcare than in the EU in average. Finnish public healthcare experienced an overall administrational renewal in the beginning of 2023, and it still impacts cyber risk management and security controls. Private healthcare is doing better in terms of technical capability. Fortunately, the EU directive for common high level of cyber security (the NIS2 directive) already has had a positive effect on many healthcare providers' cyber security.

Recommendations: Haukilehto's research results serve well also as call to action.[4] Healthcare providers should invest in continuously educating their personnel and managers about cyber security. Furthermore, public healthcare (wellbeing services counties) should continue reducing the complexity of their ICT systems and related processes in order to reduce their internal cyber risks. All healthcare providers should include ransomware threat in their business continuity plans. Participation in voluntary cyber security information sharing arrangements is a low effort and high reward activity.

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O-9: Feasibility of Synthetic Tabular Data for the Research and Development of Clinical Decision Support with Ischemic Stroke Use Case

Aysen Degerli[1], Harri Pölönen[1], Juha Pajula[1], Miikka Kivioja[1], Aino-Lotta Alahäivälä[1], Arho Virkki[2]
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Introduction: A major challenge in health data analytics is data use restrictions due to regulations including GDPR and HIPAA, which limits research and development (R&D) in healthcare. In addition, the collection of high-quality real-world data is prolonged and requires intensive manual work. Hence, synthetic data generation (SDG) is considered an alternative approach to replace real data in R&D activities and thus overcome the challenges in data collection and access within secured processing environments (SPE) [1]. In this study, we explore the feasibility of SDG methods in generating tabular data for machine learning models. Accordingly, as a demonstrational use case, we investigate the prediction of ischemic stroke (IS) occurrence.

Material and Methods: The dataset included patients of The Wellbeing Services County of Southwest Finland for 10 years from 2013-2023 and was processed in an SPE. The data included events and measures, which were recorded before the patients were diagnosed with IS. The final selection of data included 25,160 subjects with 23,010 controls and 2150 IS patients who had ICD-10 diagnosis code I63 or I69.3 recorded in the data. We first selected known risk factors age, gender, type 1 and 2 diabetes, hypertension, and LDL cholesterol as predictors[2]. In addition, we searched for laboratory measurements having the highest absolute correlation against the diagnosis, and P-APTT, S-Osmol, B-HbA1c, P-TT, E-MCH, and B-Trom were fused as features. These tests measure various aspects and relations of the blood coagulation processes and longterm glucose levels. SDG methods for tabular data were Synthpop data synthesis library in R [3] and CTGAN, FASTML, Gaussian Copula, and CopulaGAN from Synthetic Data Vault (SDV) library in Python [4], which represents both statistical and neural network approaches. These methods were used to generate synthetic data with 20,000 samples to train the prediction models. The model performances were calculated using test data, which was not used in the synthesis and training. IS prediction was performed using Extreme Gradient Boosting (XGBoost), Decision Tree (DT), and Support Vector Machine (SVM) machine learning models. Accordingly, we tested the feasibility of synthetic data using i) real data only and ii) synthetic data only during training. Quality measures from SDV were used to evaluate the synthetic data.

Results: Models generally achieved higher Area Under Curve (AUC) scores when trained with only real data than with only synthetic data. The highest AUC score of 0.76 was achieved by XGBoost trained with real data, whereas an AUC score of 0.74 was reached using only synthetic data generated with Synthpop. Contrary to other models, DT improves the AUC score from 0.571 up to 0.582 and 0.579 using only synthetic data generated by CopulaGAN and CTGAN, respectively. The real data AUC score of 0.621 by SVM was slightly improved to 0.626 when using the synthetic data generated with Synthpop. The highest SDV data quality score was achieved by Synthpop. However, the quality report revealed Synthpop data to have the highest number of nearly exact copies of real data (>10%), while synthetic data generated with other methods achieved <10%.

Discussions: This study aimed to evaluate the synthetic data feasibility for the development of clinical decision support. The results show that synthetic data is a feasible option for training the models as they achieved comparable performances in most cases with the real data. Synthetic data does not replace the use of real data, but it could be used for initial model training leaving the model finetuning for real data. This is promising, as R&D with SPE is often time-consuming and limited. With synthetic data, SPE may not be needed which can accelerate research. For this, the quality and security of synthetic data have to be generally measurable.

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O-10: Secondary use of health care data and needed competencies

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Introduction: In Finland, there are numerous national registers that contain information about the health and well-being of the entire population over decades. Data controllers, such as the Finnish Institute for Health and Welfare (THL) and Statistics Finland, are responsible for determining the purpose and processing of personal data collected in these registers. The European Health Data Space (EHDS), established by the European Union, aims to improve the management and sharing of health data within the EU, promoting patient care, research, and innovation while ensuring data protection and ethical standards. Personal data can be processed for secondary purposes, such as scientific research and development, with a data permit granted by the data permit authority in accordance with the General Data Protection Regulation of the European Union, the national data protection law, and the law on the secondary use of health and social care data. The potential for secondary use of patient data has not been adequately addressed in the content of health and social care education programs. In Finland, it is possible to gain expertise in health informatics, care effectiveness assessment, and evidence-based development, but more knowledge is needed on the secondary use of patient data. The purpose of this article is to describe the possibilities for the secondary use of patient data in Finland and the European Union, and to consider the needs and opportunities for developing the necessary competencies.

Material and Methods: The research will be conducted as an integrative literature review, focusing on the utilization of patient data in health and social care and the competencies required for its secondary use. The study also comprehensively describes the operations of health and social care registers and data controllers, as well as the regulation, practices, opportunities, and challenges of the secondary use of patient data.

Results: Health and social care patient data can be widely utilized for secondary purposes after their primary use, particularly in the research and development of care quality and effectiveness. The greatest opportunities lie in the ability to access data for the entire population and the possibility of linking data using personal identification numbers. The main weaknesses are related to potential errors and missing data, which can be addressed by improving data management and the quality of primary data entry. It would be beneficial to consider developing competencies in interdisciplinary collaboration across the entire European Union to maximize the opportunities for secondary use. Laurea has developed a curriculum supporting the skills needed for healthcare digitalization in European collaboration, and the master's program titled "Managing Digital Transformation in Health" will commence in September 2024. Students will be developing their competencies for example, of health data collection, management, analysis, digital transformation, artificial intelligence (AI) and the ethical and legal considerations related to health.

Discussion: European Health Data Space (EHDS) aims to improve the management and sharing of healthcare data in the EU, promoting patient care, research, and innovation while ensuring data protection and ethical standards. Quality of Basic Data Storage and good data management form the foundation for the secondary use of health and social data. Cybersecurity is an essential part of health and social care data management, ensuring that patient data and other sensitive information are protected from unauthorized use and data breaches. AI in health and social care data management brings significant benefits. AI can quickly and accurately analyse large amounts of data, helping to identify trends, predict disease outbreaks, and create personalized treatment plans. AI can also enhance the secondary use of data by providing new insights and solutions that would not be possible with traditional methods. Alongside infrastructure development, it is important to consider skill development in various fields of education, as interdisciplinary expertise is needed to utilize patient data under data protection. The regulatory framework for the use of such data is a critical dimension to analyse.

References are available from the authors

O-11: Information and Data Management on Planetary Health and Wellbeing within Transatlantic Ecosystem Model

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Introduction: The aim of this abstract is to establish a collaborative ecosystem network model within the framework of planetary health and well-being. The starting point is to support citizens in building well-being and health by: a) utilizing the development of information management, and b) fostering forms of cooperation that cross sector boundaries. In a future society with scarce and competitive resources, it is crucial to employ multidisciplinary models that can initiate transatlantic joint projects. The ecosystem model created in this project strengthens the position of actors from educational organizations, the public sector, the third sector, companies, and research institutes in international funding applications. With the help of this ecosystem model, actors can build project applications that accelerate the start of implementation phases and enhance the effectiveness of the projects.

Material and Methods: The goal is to create a conceptual model for Information and data Management on Planetary Health and Wellbeing within Transatlantic Ecosystem Model. Transatlantic multidisciplinary co-creation with ecosystem building approach and tools is used to achieve this. Process of service design and design methods, such as co-design and participatory design are implemented [2]. Co-design consists of 1. Identifying the essential stakeholders in individual, meso, exo, macro and chrono system levels [3,4], and 2. Identifying their boundaries/interconnection surfaces in planetary health Information and data Management context [3,4]. 3. Identifying the existing and potentially missing data resources, and important existing classification systems (professional and multi-professional) to support planetary health 4. Description of the Information and data management model.

Results: A conceptual model of planetary health shows how information and knowledge environments, knowledge and competencies regarding planetary health, and individual & societal behaviors interact and funnel through stages of access, understanding, appraisal, and application. The process leads to two main outcomes: the improvement of Earth's natural systems and human health. These outcomes are part of a continuous cycle influenced by human activities. The entire model operates on individual, societal, and global levels, emphasizing the importance of planetary health informatics across different scales and over time, including life course and transgenerational impacts. The importance of cooperation networks is especially emphasized in international financing projects that require strong expertise; financiers often expect ready-made networks already in the funding application phase. Building cooperation networks and establishing them within organizations requires both time and resources, and there are rarely opportunities for this in the project preparation phase. The ecosystem model built in the ETAPLATE project is intended to be used in future international project applications, which aim to strengthen Uusimaa region's pioneering position in the digitalisation of health and well-being and management with information. The operating model enables companies as well as the public and 3rd sectors to be more smoothly involved in further development projects.

Discussion: The planetary health framework integrates physical, psychosocial and functional capacities in building human health and well-being. The different resources of society, both identified and hidden, are seen as elements that strengthen people's health and well-being, not as a prerequisite for health. Planetary health makes use of interdisciplinary and transdisciplinary approaches, as well as modes of action that cross-sector and operator boundaries. In this case, it is also important to strengthen citizens' decision-making ability towards planetary health and well-being.

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Session 3B: Digiosaamisen vahvistaminen (Session in Finnish)

Puheenjohtaja/Chair: Outi Ahonen, Suomen Telelääketieteen ja e-Health seura (SteHS)

Torstai 14.11.2024 / Thursday 14th of November 2024
14:30 – 16:00

3B-1 Mitä kuuluu sote-henkilöstön digiosaamiselle – tilannekuva hyvinvointialueilta ja parhaita käytänteitä / How is the digital competence of healthcare and social welfare staff? – An overview from wellbeing services counties and best practices

Merja Tepponen, Social and Health Care Development Specialist, TtT, Investigation Officer

3B-2 Digitalisaatio-osaamisen viitekehys syöpää sairastavan hoidossa / A Framework for Digital Competence in the Care of Cancer Patients

Virpi Sulosaari[1], Principal Lecturer
[1]Turun Ammattikorkeakoulu

Scientific rapid presentations

O-12 Perceptions of AI-assisted welfare services: Readiness, reliance and realism

Tuuli Turja[1], Outi Ahonen[2]
[1]Tampere University, Faculty of Social Sciences, Tampere, Finland; [2]Laurea University of Applied Sciences, Espoo, Finland

O-13 Educational interventions and their effects on healthcare professionals' digital competence development: A systematic review

Emma Kulju[1], Erika Jarva[1], Anne Oikarinen[1], Mira Hammarén[1], Outi Kanste[1], Kristina Mikkonen[2]
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O-14 General digital competencies of Biomedical Laboratory Scientists, Laboratory Technologists and Radiographers

Eeva Liikanen[1], Marja Jaronen[1], Piia Kanto[1], Marianne Ellegaard[2], Henriette Lorenzen[2], Morten E. Moeller[2], Søren Jørgensen[2], Harmen Bijwaard[3], Richard Fjellaksel[4]
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O-15 From Beds to Bytes – virtual wars in healthcare

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O-16 Initial experiences of Virtual patient simulator in "As a substitute doctor at Virtual Village health center" Education Course for Medical Students in Finland

Tiina Salmijärvi[1], M.Soc.Sc., Master of Education, Henri Takalo-Kastari[1], Master of Education, Anu Kajamaa[2], Ph.D, Hanni Muukkonen[2], Ph.D, Petri Kulmala,[1,3], M.D., Ph.D, Joni Lämsä[2], Ph.D., Jarmo Reponen, M.D., Ph.D[1,3,4]
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O-17 "Human dignity and sense of meaningful life"- remote rehabilitation intervention modelling to people with cerebrovascular accident and multiple sclerosis

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Corporate presentations:

- Western Uusimaa Wellbeing Services County
- Laurea / ManagiDITH

Mitä kuuluu sote-henkilöstön digiosaamiselle – tilannekuva hyvinvointialueilta ja parhaita käytänteitä / What is the digital competence of social and health personnel – situational picture and good practices in the Wellbeing services counties in Finland

Merja Tepponen
Social- and Health Care Development Specialist, Doc. Sci (Health and Social Care) Investigation Officer

Biography Merja Tepponen

Merja Tepponen currently works as a Social and Health Care Development Specialist. On behalf of the Ministry of Social Affairs and Health, she has made a situation overview and a handbook on the digital skills of social and health care personnel and the digital abilities of the working community.

Introduction: The aim of the research is to identify current solutions, experiences, and needs in social and health care organizations regarding the development of digital skills among personnel and work communities. The research focuses on promoting necessary digital skills at work through peer and close support, and effective ways to advance digital skills and development culture. It also explores potential cooperation/network models for sharing and benefiting from practices elsewhere. The purpose of the study is to produce a handbook on promoting digital skills at work and achieving significant progress in digital skills and development culture.

Material and Methods: Data was collected through surveys, interviews, and workshops. The survey assessed professionals' experiences of the importance of various digital competence areas and their self-assessed skill levels, identifying skill gaps. Respondents (N = 735) were aged 20-68 (mean age = 47), with 89% women and 77% having higher education. Responses came from 19 wellbeing services counties, with 5-138 respondents per area.
Interviews targeted wellbeing services counties management, digital development experts, and certain ministry and expert organization representatives. Two companies owned by welfare regions were also included. Interviews (N=112) were conducted on Teams, recorded, and notes were made. Interviewees included 95 from welfare areas and 17 other experts.
Ten workshops focused on digital solutions and competence development, with 235 participants from various wellbeing services counties, the City of Helsinki, HUS Group, and other networks and institutions. Participants included professionals from nursing, rehabilitation, medicine, social work, and rescue.

The preliminary findings: Social and healthcare professionals feel that digitization has preserved the meaningfulness of work and the balance between traditional and digital forms of work. However, digital competence levels varied, with about a third of personnel having deficiencies. There were gaps in basic skills, but expertise was also found in demanding skill areas. The ability was estimated to have improved in recent years. New work roles have emerged due to digital services. The culture of work communities, attitudes, and available support significantly impact digital competence. The culture changes slowly and it slows down the introduction and spread of digital services. Management's commitment and an experimental culture are crucial for digital changes. The results present a cooperation/network model.

Discussion: As the recommendation of the study are to organizing digital support staff, digital mentors, to help work units develop digital services and support professionals. Involving personnel in development, experiments, and pilot. It is ensured the organization has enough expertise in joint development. Appropriately as digital. A functioning balance between remote and on-site services and the positive image reported by most of the digital readiness of their own work community describe how Finland has succeeded in digitizing the social services sector.

Digitalisaatio-osaamisen viitekehys syöpää sairastavan hoidossa / A Framework for Digital Competence in the Care of Cancer Patients

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Biography Virpi Sulosaari

Dr (PhD), RN, Virpi Sulosaari is principal lecturer and research group leader from the Turku University of Applied Sciences. She is leading a EU4Health co-funded project Digital Skills Training for Health Care Professionals in Oncology (DigiCanTrain) 2023-2026.

Background: The development of digital health has enabled professionals to provide new kinds of opportunities to produce health services to address the needs of the population, regardless of the environment and specialty. Recently, digital health services have increasingly come up in discussions about the availability, fluency and efficiency of healthcare services. Increasing number of people will develop cancer at some point in their lives and need various health services related to the cancer treatments and care. In cancer care, digital services can meet the growing demand for flexible and cost-effective services by enabling, for example, self-monitoring of symptoms caused by the disease and treatment, as well as information to support self-care through various remote monitoring applications.

As digital services increase and develop, there is a need to change the culture of care and to introduce new kinds of expertise in the introduction of various services and digital tools. The digital care environment requires the renewal of existing practices, for example, special attention must be paid to interaction and communication. Artificial intelligence and rapidly developing diagnostic methods for assessing, planning and implementing treatment and care have changed the work of professionals. In Finland, healthcare professionals have previously estimated their digital competence to be at a good level, but competence gaps have been observed in areas such as technology and service competence, motivation and re-planning of operations.

The need for development has been identified as an international challenge, even though the digitalisation of health services is at very different stages in different countries. Cancer diagnostics, treatment and monitoring are strongly developed in Europe in line with the EU's Beating Cancer Programme published in 2021. At the core of the development of treatment and services is the person with cancer and the entire continuum of cancer care from early identification to recovery, as well as increasing the quality of life and supporting patient participation. The EU makes a significant contribution to research and development of cancer diseases as well as research and development of comprehensive treatment for cancer patients. Together with an international consortium, Turku University of Applied Sciences coordinates and implements the Digital Skills Training for Health Care Professionals in Oncology 2023-2026 (DigiCanTrain) project, which includes the creation of a digital competence framework for healthcare professionals working in the treatment of cancer patients.

Main content of the speech: The presentation describes the key starting points and implementation of the DigiCanTrain project. In particular, the presentation focuses on the digital competence framework in this clinical specialty. This project will produce and implement a training package for professionals focusing on digital competence in the care of people with.

Recommendations for future work: The project is about to launch a pilot that will assess the digital competence of the participating professionals before and after the training. In the future, it would also be important to assess the connection between education, clinical practice and the change it may support in the provision of health services and the monitoring of treatment and care of people with cancer.

O-12: Perceptions of AI-assisted welfare services: Readiness, reliance and realism

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Introduction: Artificial intelligence (AI) is changing our health and social care service environment now even at a faster pace, because the EU´s AI act was accepted in 2024 and the solutions are getting increasingly more advanced. AI refers to the machine's ability to use skills traditionally associated with human intelligence, such as reasoning, learning or planning. In machine learning, AI is used for classification and forecasting based on the material provided to the system. AI competence is understood as an orientation to understand and learn about AI and AI ethics, the skills to apply AI, and the perceived AI self-efficacy. In this study, we examined the self-evaluated AI competence of health and social care professionals.

Material and Methods: The study used survey data collected by the Ministry of Social Affairs and Health in Finland. Employees in the public social and health services (ESHs) were invited to respond to the electronic questionnaire *ex officio* in 2024. A total of 735 responses were obtained in the set timeframe of two weeks. The respondents were mostly female (89%) and aged from 20 to 68 (M = 47). Over half of the respondents (62%) worked primarily in direct customer or patient work and almost the same proportion (61%) reported doing customer or patient work digitally.
For this study design, the most relevant section of the questionnaire consisted of statements about utilizing artificial intelligence in respondent's own work. Seven statements were assessed, first, regarding the perceived importance of the matter, and second, regarding their personal competence in the matter. The responses were given on a scale 1 = Disagree, 2 = Somewhat disagree, 3 = Somewhat agree, 4 = Agree. The delta variable calculated for the items was used in the analysis as a compound dependent variable 'AI competency deficit' (AICD*)*. In the study design, AICD was examined through explanatory variables of qualitative and quantitative work experience. Qualitative work experience refers to the status, namely the occupation and if the respondent had supervisor responsibilities or not. Quantitative work experience refers to the working years the respondent reported having in welfare services.

Results: Future AI assistance was perceived as highly important by the respondents. Less than every third (29%) felt like their AI competence was compatible with the perceived importance of utilizing and understanding about AI-assisted work and systems. While 12 percent reported greater competence than importance, significant majority (59%) indicated AICD. In occupational comparison, AICD was significantly less probable among practical nurses ($H(9)=17.37$, $p < 0.05$). AICD did not depend on the supervisor status, nor a level of education.

Working experience was found as a significant explanatory factor in AICD ($H(5)=17.45$, $p < 0.005$). However, the relation was not linear. ESHs with work experience from three to five years reported less AICD, whereas those with work experience from 16 to 20 years reported the most AICD. This is notable especially because age correlated with AICD only marginally. A very slight negative correlation was also found between graduation year and AICD.

Discussion: Our study focusing on ESHs' perceptions of AI-assisted welfare services revealed elements of readiness, realism and reliance. First, *readiness* stood out as the paramount importance placed on AI. In other words, there are expectations that AI-assisted systems will positively transform work. Second, the *reality* of the current situation is well acknowledged. AI competence is something that is in its infancy which is understandable in an era of emerging AI assistance. The most confidence about their skills to utilize AI was found in the subgroup who were relatively new in the field but already had a few years of work experience. The question is, has this group been involved more in (informal) education about AI. Lastly, *reliance* refers to the high self-efficacy expressed by the respondents. Although AI is not yet a part of an everyday practice, ESHs have trust in their abilities to learn AI assisted systems.

AI has many possibilities in different areas of health and social care: prevention, self-care, clinical care, and health and social services management. There is a need to support AI competence among nearly all ESHs. National and regional cooperation with educational institutions provide opportunities to effectively strengthen the competence of professionals in health and social care, but also in educational institutions.

O-13: Educational interventions and their effects on healthcare professionals' digital competence development: A systematic review

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Introduction: The rapid progress of digital technologies has led to the development of new and innovative services, tools and applications in healthcare and to changing practices in healthcare delivery [1,2]. With reforming practices, ensuring healthcare professionals' adequate and appropriate digital competencies is essential to ensure the delivery of quality, on-time and evidence-based care [3,4]. Previous studies have mainly focused on investigating a specific area of digital competence or technological solution or concluded that majority of interventions have been targeted at physicians [5]. The aim of this review was to identify and describe educational interventions developed to improve various aspects of the digital competence of healthcare professionals and the effects of the interventions.

Material and Methods: A comprehensive synthesis of relevant studies was conducted by following the Joanna Briggs Institute guidelines for conducting systematic reviews [6]. Five databases (PubMed, Scopus, CINAHL, ProQuest and Medic) were searched for studies against the study eligibility criteria up to November 2023. Two researchers independently assessed the eligibility of the studies by title, abstract, full text and the methodological quality. In total 20 original studies fulfilled the eligibility criteria. The data was tabulated and analysed with narrative synthesis.

Results: The findings suggest that the educational interventions developed and delivered to improve digital competencies of healthcare professionals are highly heterogenous. Education was offered through traditional contact teaching, using a blended-learning approach and through videoconference. Learning was enhanced through lectures, slide presentations, group work, case studies, discussions and practical exercises or simulations. Educational interventions achieved statistically significant results regarding participants' knowledge, skills, attitudes, perception of resources, self-efficacy or confidence and output quality relating to the use of digital technologies.

Discussion: The results of this study indicate that the training interventions had a significant influence on the digital competence of healthcare professionals by using versatile methods. The interventions included in this review most commonly assessed participants' knowledge, skills or perceptions related to digital technologies. The findings of this review suggest that digital competence development benefits from a multi-method approach combining traditional contact teaching, lectures with supplementary materials, practical exercises and collaborative learning. Future research should explore the applicability of e-learning for interventions to promote different areas of healthcare professionals' digital competence.

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O-14: General digital competencies of Biomedical Laboratory Scientists, Laboratory Technologists and Radiographers

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Introduction: Technological literacy for laboratory and health technology professional education (TechLit) project is implemented 2024-2026 and funded by Erasmus + (Cooperation partnership in higher education). The main objective of this project is to develop novel approaches to teaching digital and technological literacy and competences in three technology-driven professions: biomedical laboratory scientist (BIO), laboratory technologist or laboratory technician (LAB) and radiographer (RAD). At the first phase the aim is to identify and formulate skills and competencies of digital competences of these professions. The Digital Competence Framework for Citizen (DigComp) is published by EU Commission. This framework consists of information and data literacy, communication and collaboration, digital content creation, safety, and problem solving [1].

Material and Methods: Identification and formulation skills and competencies of digital competences were started by mapping different teaching activities and to condensate the essence of the specific activity into few generic competencies, that might be alike across activities, subjects and boarders. Generic competencies were mapped in all degree programmes (BIO, LAB and RAD) at four higher education institutions: Tampere University of Applied Sciences (TAMK), University College Copenhagen (KP), Inholland University of Applied Sciences (InHolland) and The Arctic University of Norway (UiT). Mapping of the competencies was performed analysing curricula. In analysing was utilized summative content analysis, which involves counting and comparisons, content, followed by the interpretation of the underlying context [2]. The competencies were evaluated separately in BIO, LAB and RAD groups and all groups together at KP in May 2024.

Results: The preliminary findings indicate that, digital competencies for biomedical laboratory scientists, laboratory technologists and radiographers able to categorize as information and data literacy, digital content creation, problem solving with a computational thinking perspective, safety, and communication and collaboration. However technical proficiency is essential for these laboratories and health technology professional education. Technical proficiency includes operating equipment, technical instructions, navigating user interface and equipment understanding.

Discussion: The results will become more accurate when the final analysis is completed. At the same time will become evident proportions of unique and common competencies in biomedical laboratory scientists', laboratory technologists' and radiographers' educations.

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O-15: From Beds to Bytes – virtual wards in healthcare

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Introduction: The Finnish healthcare sector is facing significant challenges due to an ageing population, a high prevalence of chronic diseases, and a shortage of healthcare professionals. There is a need for novel solutions to address this, and one solution could be virtual wards, a concept that has been pioneered in the UK. Virtual wards use health technology to provide hospital-level care at home, freeing up hospital beds for more critical cases. These wards complement the existing care model, as patients receive comprehensive care remotely, including vital sign monitoring, lab tests, and medication administration, managed by a professional team [1]. During the COVID-19 pandemic, the use of virtual wards increased [2,3]. Even though their success is still debated, preliminary studies indicate that virtual wards are safe, accessible, and effective, particularly for the ageing population and reducing unnecessary hospital admissions. In the UK, virtual wards are rapidly developing and show potential to reduce primary care costs [3,4,5]. As technology evolves and the pressure on the healthcare sector increases, virtual care is becoming essential. However, one of the challenges is the integration into existing care environments [4,5]. Studies show that healthcare professionals struggle to keep up with health technology and digital skills, which significantly impacts decision-making. Nurses need further education to better assess health needs and provide advice and care using e-health solutions [6,7]. Here, educational institutions could play a crucial role, by developing competency-based programs and continuous education tailored to meet the needs that virtual care demand set on professionals [6,7].

Material and Methods: At Arcada University of Applied Sciences, we are developing learning materials and course contents using multi-modal methods to equip nursing students and healthcare professionals with competencies for virtual healthcare settings. Additionally, students will learn to employ critical thinking in regard to technology, adopt a holistic view, and adhere to evidence-based practices to make informed clinical decisions and create personalized care plans for virtual care. This virtual ward initiative is integrated into Arcada's Patient Safety and Simulation Center (APSLC).

Results: Following pilot testing, the learning modules will be integrated into the nursing career path. This approach aims to maintain and enhance the digital competences of healthcare students and professionals in an evolving healthcare setting. By focusing on the unique challenges and opportunities of providing care in a virtual environment, Arcada aims to ensure that future healthcare professionals are well-equipped to deliver high-quality patient care in a rapidly changing healthcare reality.

Discussion: Even if the evidence base for virtual care, and the virtual ward concept is extensive [5], further research is required. At Arcada, research and evaluation will be integrated into the development process of virtual care and virtual wards to ensure high-quality and patient-safe care. As measures to solve the threats facing the healthcare sector are vital, educational institutions need to react accordingly. With the right measures we can not only enhance patient care but also position Finnish healthcare in the forefront of global innovative healthcare delivery.

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O-16: Initial experiences of Virtual patient simulator in "As a substitute doctor at Virtual Village health center" Education Course for Medical Students in Finland

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Introduction: Higher education has to prepare students for an evolving healthcare landscape. Competences of a graduated doctor have to meet the demands of modern and rapidly developing healthcare. The skills needed to work as a doctor should be practiced already during basic studies. Although the opportunities and benefits brought by digitalization have been recognized in basic medical education, more researched information is still needed on how to meaningfully combine pedagogical solutions and medical learning content in digital environments. While patient simulators have been used in teaching for a long time, more research information on the teaching use of virtual patient simulators is needed [1,2,3].

Material and Methods: The research material has been collected in an optional course aimed at students (n =11) of the fourth- and fifth-year medical studies. The course was implemented in the year 2023-2024. The focus of the course was to model the stages of clinical reasoning in a doctor's work. The course was implemented in a virtual environment, where students solved 10 virtual patient cases. The focus of this study course was promoting clinical reasoning and solving the patient case in context of primary health care. The students got immediate, personal feedback on their solutions via a simulator automatically (11 students x 10 feedback report =110 reports). After this, they were asked to examine their own reasoning process and make relevant observations related to it (11 students x 10 case = 110 written reports by students). The most important observations were discussed in a learning platform, and patient cases and the thoughts they evoked were reviewed in a joint close meeting. In addition, the students gave comprehensive student feedback on the course.

Results: The preliminary findings: 1) The students spent an average of 30 minutes solving one virtual patient case and solving time varied from 1 minute to 4 hours. The students were with the patient for an average of 19 minutes, with a range from 1 minute to 1 hour. The students asked the patient an average of 36 questions, with a range of 0 to 95 questions. An average of 40 studies were ordered, with a range of 0 to 159. 2) The texts describing clinical reasoning produced by the students were of very different levels. This happened even though they had received auxiliary questions to help them write the text.
3) The students' feedback on the course was positive. The students felt that they learned how to use the virtual patient simulator, and the reflection texts deepened what they had learned. All students who responded to the feedback survey (n=8) recommended the course to other students as well.

Discussion: The students' clinical reasoning skills and the whole process are just developing and being structured. This may explain partly the large variation in different areas of the process. The students examined and analyzed their reasoning process in their texts at very different levels. The virtual patient simulator can be a useful way to enrich teaching by giving the students a possibility to practice topics they have learnt earlier, in a way which simulates real life processes. It is important for students that they can practice encountering a patient in a safe environment. From the student's point of view, it is important that they must apply the knowledge they learned earlier when solving the virtual patient cases.

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O-17: "Human dignity and sense of meaningful life"- remote rehabilitation intervention modelling to people with cerebrovascular accident and multiple sclerosis

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Introduction The impetus to our research is the realization that we need to supplement the current rehabilitation mainstream research with more holistic, multidisciplinary and interdisciplinary approaches that focus on the different aspects of the entire rehabilitation process, its effectiveness and both short- and longer-term impacts [1]. "Human dignity and sense of meaningful life" multidisciplinary research group has set as a goal to reach a deeper understanding of the role of human dignity, meaningful life, hope and participation related factors as possible success factors for rehabilitation processes and their longer-term effectiveness. We also consider future trends in rehabilitation services, especially the growing role of remote rehabilitation and digital technologies. The important elements of technology assisted rehabilitation consist of: motivation and commitment support, enablement of social interactions and social relationships, design of safe and variable training environments, flexibility in choosing relevant and meaningful activities for oneself, identification of rehabilitation needs and goals, and support for rehabilitees to understand their current functioning status and the appropriate paths to improvement [2]. The goal in this paper was to create the model of interdisciplinary and biopsychosocial rehabilitation intervention based on our previously created model of "Human dignity and sense of meaningful life". The model considers the values of human dignity, autonomy, participation, meaningfulness of life as well as the essential prerequisite of technology.

Material and Methods: This study is secondary analysis of systematic literature review of 50 qualitative studies (711 rehabilitees). The entire process of secondary analysis was carried out using researcher triangulation and inductive synthesis conducted by the authors by using the results of cerebrovascular accident (CVA) and multiple sclerosis (MS) rehabilitees´ experiences in physiotherapy and used rehabilitation technology [1,2]. CVA and MS rehabilitees´ have many functional capacity challenges, which may affect persons' physical, psychological, social, and cognitive functioning, daily life activities, participation, and quality of life. So, the target group is excellent at modeling a multidisciplinary and demanding rehabilitation intervention.

Results: The results of this paper were the first version of the 66rganizing66n human dignity and sense of meaningful life rehabilitation intervention for the groups of AVH and MS rehabilitees. The central and novel idea of "Human dignity and sense of meaningful life" intervention is that 1) rehabilitees have freedom to flexibly make their personal choices during their rehabilitation process, 2) rehabilitees can create their own preferred intervention which they also can modify during the process and 3) rehabilitees motivated to use rehabilitation technologies that it provides personalized support across all functioning domains (physical, psychological, social, and cognitive). In addition, the key prerequisites for successful rehabilitation are coupled with the autonomy for the rehabilitees to flexibly variate between the exercises and tasks that are significant and essential to their own life situation and requirements, which are the most important ones at a given time. Intervention is designed in such a manner that it can be used for remote rehabilitation utilizing appropriate technologies. The model is therefore generic and not technology specific.

Discussion: In future the accessible and feasible of Human dignity and sense of meaningful life rehabilitation intervention (including technology) as well as effectiveness of intervention should be tested in the real rehabilitation context.

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Session 4A: Uptake and impact of digitalization (session in English)

Chair: Paula Veikkolainen, Finnish Society of Telemedicine and eHealth (FSTeH)

Thursday 14th of November 2024

16:30 – 18:00

4A-1 Health care digitalization across EU member states – past achievements and new challenges

Karl A. Stroetmann, Dr., Adjunct Professor[1], Life Fellow[2], Director[3]
[1]School of Health Information Science, University of Victoria, BC/Canada; [1]Royal Society of Medicine, UK; [3]International Society for Telemedicine and eHealth, Switzerland

4A-2 User experience of health IT in the course of years in Denmark

Christian Nøhr[1], Professor
[1]Aalborg University, Denmark

Scientific rapid presentations

O-18 Patients' perspective on using consumer wearables for digital remote monitoring at home

Melika Azim Zadegan[,1], MSc, Rosa Sahlström[,2], MB, Eeva Aromaa[,1], PhD, Tero Montonen[,1], PhD, Päivi Eriksson[,1], PhD, Ville Leinonen[,3], PhD
[1]Business School, University of Eastern Finland, Kuopio, Finland; [2] Neurosurgery, Institute of Clinical Medicine, University of Eastern Finland, Kuopio, Finland; [3] Department of Neurosurgery, NeuroCenter, Kuopio University Hospital Neurosurgery, Kuopio, Finland

O-19 The relationship between attitudes, emotions and the intention to use digital rehabilitation solutions: Insights from Rwandan rehabilitation professional

Kaisa Lällä[,1,2], MSc, MHSc, Eeva Aartolahti [1], PhD, Michael Oduor[,1], PhD, David Tumusiime[3], PhD, Katariina Korniloff[,1], PhD
[1]Institute of Rehabilitation, JAMK University of Applied Sciences, Finland; [2]Faculty of Information Technology, University of Jyväskylä, Finland; [3]College of Medicine and Health Sciences, University of Rwanda

O-20 Prevention and Well-being in the Cross-border Region: WellData, an Innovative Collaboration for Data Exchange

Elisabeth Honinx[,1], PhD, Annelies Van den Eynde[,1], PhD, Pieter Van Gorp[,2],PhD, Prof, André Boorsma[,3],PhD, Jildau Bauman[,3],PhD, Vicky der Auwera[,4],ir., MSc, Kim Helsen[,4],PhD, Nathalie Lambrechts[,1], PhD
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[3]Nederlandse Organisatie voor toegepast-natuurwetenschappelijk onderzoek (TNO), Den Haag, the Netherlands; [4]Thomas More Kempen, Geel, Belgium

O-21 Chain of Portable Health Folder: A Systematic Literature Review

Duarte Mateus, BA[1,] Ana Lúcia Martins, MSc, PhD[1,] Ricardo Correia, BA[2]
[1]Iscte – University Institute of Lisbon (Iscte-IUL), Business Research Unit (BRU-IUL), LisbonPortugal; [2]BioGHP – Global Health Platform

O-22 Remote monitoring for hypertension management: evaluating the effectiveness of telemedicine in rural Kentucky

Naya Chopra[1], Lalit Vadlamani[1] MD
[1]Appalachian Regional Health

Corporate presentations:

- Sensotrend
- Laurea / ManagiDITH

Health care digitalization across EU member states – past achievements and new challenges

Karl A. Stroetmann, Adjunct Professor[1], Life Fellow[2], Director[3]
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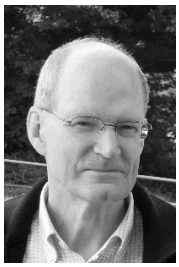
Biography Karl A. Stroetmann



Karl's research and consultancy have focused for 30 years on (global) digital health, healthcare delivery, and health systems on three continents. His partners/clients have involved various organisations of the European Union, international organisations like OECD, WHO, Global Fund, national governments, as well as healthcare providers and industry.

Context: A 30+ year old mantra, recently (April 2024) again noted in a WHO Science Council report: "The world is becoming increasingly digital, … improving efficiency, accessibility, reducing costs, and in the private sector, increasing profitability. … Despite large investments and ongoing global efforts to digitize health systems, this sector is yet to fully benefit from the potential of digital transformation."

Objective: Review and discuss major activities and results in the domain of "ICT for Health", "Telemedicine", "eHealth", "Digital Health" – whatever the buzzword may be – in Europe.

Method: Review of literature and EC reports, policy documents, inputting personal experience from 30 years professional activity in the field.

Results: Some regional/national health systems, particularly in smaller Member States with NHS-type healthcare financing systems, initiated already in the 90's basic digital health systems, ranging from the exchange of messages across actors to integrated electronic records for all patients. At the same time, the EC developed programmes and later on invested heavily into research and implementation projects in this domain. Coordination activities across health policy representatives of the increasing number of member states followed. Restricted by EU law, the EC could only initiate, 68rganizi and partially finance an electronic patient data exchange infrastructure for xBorder healthcare provision (focusing on ePrescriptions, Patient Summaries …). – EU-wide studies on patient safety, interoperability, ePrescribing, socio-economic impact assessment, comparisons of MS achievements in various application fields etc. supported these undertakings. Transatlantic cooperation and learning from case studies also contributed. xB implementations continue, COVID 19 and EU-wide certifications provided new challenges.

Analysis: Due to the legal restrictions at the EU-wide level, national initiatives were the major driving force. But they also resulted sometimes in a huge waste of taxpayer money: e.g., England's NHS National Programme for IT – NpfIT – was abandoned after 5 years with a loss estimated at 4-10 billion GBP; in Germany, an electronic Health Card was introduced in 1995, but this technology push resulted in an estimated loss of >1 billion €.
Differentiated analyses of highly complex regional and national health systems and markets, the impact of reimbursement regulations etc. on the behaviour of stakeholders with widely divergent interests, the needs of patients, their trust, expected benefits and behaviour were not understood, differences between healthcare (financing) systems like Bismarck/Beveridge/Out-of-Pocket were not reflected. Nevertheless, EU activities stimulated digital health developments as well as competition across member states, and various lessons learned where identified.

The Future:
- AI might indeed have a considerable impact, but needs prospective studies, regulation, certification
- Coping with future pandemics and disasters will need new approaches
- Telemedicine must adapt to cultural & other diversities of patients
- The EU Health Data Space may learn from xBorder Services & and their interoperability solutions

User experience of health IT in the course of years in Denmark

Christian Nøhr[1], Professor
[1]Aalborg University, Denmark

Biografia Christian Nøhr

Christian Nøhr is a Professor at Aalborg University, Denmark. Professor Nøhr has also been working in the University of Southern Denmark. His research interests seek to health informatics and health care, and he has published a lot of user experience of electronic health record systems. He is the past President of the Nordic eHealth Research Network. He is also the main organizer of the Danish eHealth Observatory -conference.

Patient records has been used for more than 250 years. Most of the time records kept on paper. Only during the last 70 years computers have been introduced to ease the entry and retrieval of patient data. A diversity of interest in different functionalities have emerged as electronic patient record systems have been developed and implemented. New systems have been introduced with optimistic predictions, however the wishful thinking has often been met with disappointment as the system has been implemented. In order to learn from these situations, it is necessary to obtain data on central issues as the systems can only produce outcome if they are used by the clinicians.

In the Nordic e-Health Research Network (NeRN) we have developed indicators e.g. measures of user experience to monitor the availability and use of EHR systems. This talk will present what we can learn from clinicians' experience with using EHRs in Denmark.

O-18: Patients' perspective on using consumer wearables for digital remote monitoring at home

Melika Azim Zadegan[1], MSc, Rosa Sahlström[2], MB, Eeva Aromaa[1], PhD, Tero Montonen[1], PhD, Päivi Eriksson[1], PhD, Ville Leinonen[3], PhD

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Introduction: The use of digital consumer wearables for digital remote monitoring (DRM) at home has increased over the past two decades. However, there is a limited understanding of the patients' expectations towards using these devices in the health care context. Drawing from the literature of promissory digital health [1] and sociology of expectations [2], we define expectations as beliefs, anticipations and visions about future developments. Studying widely shared expectations is relevant because they may influence public opinion about the future and the direction of research and innovation [3]. This study focuses on patients' expectations concerning the consumer wearable, Oura ring, prior to its implementation and use in a specific healthcare context. Oura is a small, lightweight device designed for tracking one's personal well-being. Much of the previous research on digital health has focused on device usability [4], and previous studies on the Oura ring have examined retrospective perspectives of user experiences with the Oura ring within healthcare context. In contrast, this study takes a future-oriented approach to focus on patients' expectations regarding the Oura ring for DRM at home.

Material and Methods: The qualitative study used semi-structured interviews conducted by a healthcare professional with ten consented patients (aged 64-79; five men, five women) who visited the Kuopio university hospital in Finland for a suspected neurological condition between 2022-23. The interviews focused on patients' beliefs, anticipations and visions of the potential use of the Oura ring for DRM at home. The interview transcripts were coded inductively into first-order categories, second-order themes, and aggregate dimensions. The study has an ethics certificate from the Research Ethics Board of the Northern Savo Hospital District.

Results: We identified four three-level themes of patients' expectations toward the potential use of Oura for DRM in their home: user-friendly design, privacy and data accuracy, user-friendly monitoring process, and perceived usefulness. The themes shed light on patients' expectations toward healthcare professionals that highlighted real-time physiological tracking, prompt communication and care, and support in using Oura. Furthermore, they illuminate patients' expectations toward themselves and their caregivers', including their engagement and adherence to monitoring in the home environment, as well as self-management of health and family members' involvement.

Discussion: This study offers new knowledge on what patients expect from different actors involved in DRM at home. The findings highlight how patients' expectations extend beyond the device and toward the roles of healthcare professionals and family caregivers, but also the patient's own role. Our findings show that patients expect a user-friendly design in the wearable device used for DRM at home, that integrates seamlessly with their daily routines while providing actionable insights to help them manage their own well-being. Additionally, they expect healthcare professionals to provide training and support for using the device during or after use of the device and provide real-time feedback regarding patient general wellbeing. Our findings also suggest that patients envision themselves playing an active role in the DRM process, which they believe may enhance their ability to manage their wellbeing. Furthermore, patients expect family caregivers to provide support and basic IT assistance in using the device, which requires the active involvement of family caregivers in supporting the patient's needs through DRM process at home.

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O-19: The relationship between attitudes, emotions and the intention to use digital rehabilitation solutions: Insights from Rwandan rehabilitation professional

Kaisa Lällä[1,2], MSc, MHSc, Eeva Aartolahti[1], PhD, Michael Oduor[1], PhD, David Tumusiime[3], PhD, Katariina Korniloff[1], PhD

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Introduction: Limited access to rehabilitation services is a major challenge in low- and middle-income countries [1, 2]. Digital rehabilitation services have the potential to decrease this gap by offering effective and safe rehabilitation services for clients [3]. This study is part of an international project that aims to increase access to rehabilitation in low- and middle-income countries by proposing a digital-first approach for providing rehabilitation services [4]. The objective of this study is to investigate the relationship between rehabilitation professionals' emotions and attitudes and intention to use digital rehabilitation solutions in their work.

Material and Methods: Data for this study was collected during two time periods: from July to November 2022, and then from October 2023 to January 2024. A total of 58 rehabilitation professionals (67 % men) completed the online survey at the beginning of implementation of a digital rehabilitation solution (Physitrack) and out of those, 23 (40 %) responded to the follow-up survey. Attitudes were explored using Information Technology Attitude Scales for Health (ITASH) [5], divided into three categories: negative, neutral, and positive. Emotions were explored using an emotional scale [6] that consists of two factors, "distress" and "positive arousal". The intention to use digital rehabilitation solution (Physitrack) was assessed using a seven-point Likert scale, divided into three categories: will not continue (points 1 to 3), neutral (point 4), will continue (points 5 to 7). The data collected at the beginning of implementation was used to analyse the association between attitudes, emotions, and intention to use Physitrack. Crosstabs and Chi-Square were used to evaluate dependence between categorised attitude and intention to use Physitrack. Binary logistic regression was used to assess the relationship between distress and positive arousal and intention to use Physitrack.

Results: Initially 91% of respondents had positive attitude towards digital rehabilitation (M=64, SD=6,3). At follow-up, the ITASH score decreased (M=57, SD=7,3), but not significantly (p=.860). The Pearson chi-square test revealed a significant dependence between positive attitude and intention to use Physitrack (χ^2=18,33, p<0.001). Positive arousal was significantly related to a higher intention to use Physitrack (OR=1.29, p=.008), while distress was not (OR=.89, p=.22).

Discussion: Based on the results, it is not possible to definitively determine a relationship between attitudes, emotions, and the use of digital rehabilitation solution. However, positive emotions and attitudes seem to be associated with a higher intention to use digital rehabilitation. Further research with a larger population is needed to confirm connection between emotions, attitudes, and use of digital rehabilitation solutions.

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O-20: Prevention and Well-being in the Cross-border Region: WellData, an Innovative Collaboration for Data Exchange

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Introduction: European regions are confronted with the growing burden of non-communicable diseases, highlighting the need for prevention and the collection of standardized data in these fields. The European Health Data Space (EHDS) aims to facilitate cross-border knowledge exchange, making it essential to explore how interoperable data systems can support scalability and foster innovation in both prevention and well-being across member states. The WellData project seeks to create an interoperable ecosystem that enables standardized cross-border data exchange to enhance both primary and secondary prevention. As these data are often generated outside the clinic, responsible use and governance of health data are crucial, ensuring privacy and security by design while empowering citizens with control over their personal information. [1-3]

Material and Methods: This multi-disciplinary project brings together 14 partners with expertise in health data management, preventive healthcare, and technological innovation. Key activities will be coordinated through work packages, focusing on the development of standardized and quantifiable health data indicators, secure and ethical data storage, and interoperability guided by FAIR (Findable, Accessible, Interoperable, Reusable) data principles. Cross-border Pilot studies will validate these innovations across various 'field labs'. Ethical, legal, and social aspects (ELSA) will provide the framework for governing these efforts, ensuring that the project aligns with societal values and complies with legal requirements. In addition, an ecosystem will unite key stakeholders from Flanders and the Netherlands, including academia, government bodies, healthcare professionals, citizen organisations and private companies. [4]

Results: Initial testing of data interoperability between personal data spaces has shown promising results in secure exchange. The current project aims to establish a cross-border data-sharing infrastructure and integrate health outcomes into healthcare practices, aligned with EHDS goals. A demonstrator will be developed and validated via pilot studies in three care settings, supported by knowledge, tools, and feedback from the ecosystem. Standardized protocols for personal health data management will be implemented.

Discussion: This project underscores the potential to create a scalable model for personalized preventive healthcare driven by personal health data, within the framework of the EHDS. By integrating technical, ethical, and legal considerations, the project aims to deliver innovations that are both technically sound and socially responsible. A learning network will be instrumental in spreading best practices across the health ecosystem, supporting future projects, and ensuring that the developed solutions can be adapted to diverse regional contexts. Ongoing stakeholder engagement and collaboration will be critical to ensuring the long-term sustainability of the project's outcomes.

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O-21: Chain of Portable Health Folder: A Systematic Literature Review

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Introduction: After their earliest development in the 20th century, Health Records (PHRs), and Over-the-counter (OTC) **Error! Reference source not found.**records, developed around the growing patient needs of availability, empowerment, and patient-centric data management. By, leveraging modern technologies and supporting a personalized approach to healthcare [1]. Health Wallets represent the next step in the fast evolution of digital health records, hence the paper's objective at exploring the characteristics of existing patient information platforms, advantages and limitations of their use, and gaps in the current solutions.

Material and Methods: To reach the research objective, a Systematic Literature Review following the PRISMA framework will be conducted [2]. 3 databases were used: IEEE Xplore, Scopus, and PubMed – chosen for their coverage in the fields of management, healthcare and technology. Grey literature results were considered due to the novelty of the topic. There were no restrictions to the years of analysis. The initial search, following 5 distinct keywords ("Health Wallet", "Digital Health Wallet", "Personal Health Wallet", "Healthcare Wallet", "Medical Wallet"). 850 papers were identified, from which 36 articles were kept.

Results: Results show that healthcare professionals generally welcome the introduction of Apps and Wallets in their practices [3]. Although the concept was first explored in 2017, comprehensive research accelerated with the Covid-19 pandemic, in 2021. Patient information platforms, used by both medical professionals and patients, are characterized by being portable health record management systems, similar to folders but that allow for information transactions. The main reported concerns relate to Interoperability issues, Data Protection, and Quality of Care. Conversely, the main advantages usually lie on Data Aggregation, Accessibility, and Care continuity. Continuous use of these systems is influenced by factors such as user attitude, satisfaction, perceived usefulness, and self-efficacy [4].

Discussion: Physicians may feel reluctant to deviate from routines [5] with the major issues identified effectively addressed through the usage of FHIR, Blockchain and Role Based Access, as well as Bidirectional Communication and Mutual Authentication. However, semantic challenges may still affect interoperability. These should aim to mitigate information dissemination for Physicians, i.e., concentrating information, joining different sources into one without the need for manual handling. They should integrate seamlessly into existing processes to avoid adding complexity to workflows. Future research should dwell on the diminishing marginal returns of another tool. One of the contributions of this paper, is that the ideal Health Wallet should guarantee confidentiality and privacy, builds on user experience throughout the service, and increases physicians' efficiency and effectiveness; targeting time, resource and information management. Ongoing developments are promising, with tools such as the BioWallet, with the potential to bridge these existing gaps.

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O-22: Remote monitoring for hypertension management: evaluating the effectiveness of telemedicine in rural Kentucky

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Introduction: Cardiovascular disease is one of the leading causes of death in the United States. Rural populations, especially, experience this morbidity at a heightened risk due to limited healthcare access. This study aimed to audit two types of hypertension care practices being offered at a rural clinic in Kentucky: remote patient monitoring of blood pressure with daily reminders, and standard care. Standard care consists of annual well visits and pharmaceutical intervention.

Material and Methods: All patients with hypertension at the rural Kentucky clinic were eligible to participate, were between the ages of 45 to 82 years old, and were diagnosed with hypertension at the time of enrollment. One group of patients received clinic-provided blood pressure cuffs and daily reminders to submit blood pressure readings via SMS. The other group received standard hypertension care. The primary outcome was time to target blood pressure. De-identified data was analyzed.

Results: Patients receiving daily reminders and taking readings with at-home blood pressure monitoring achieved target blood pressure faster than the control group (12.9 days vs 41.1, $p < 0.05$). Male patients reached target blood pressure quicker than female patients)12.3 days vs. 14.5 days). Patients aged $\geq$ 60 years old achieved faster time to target compared to those < 60 years old (12.8 days vs. 17.1 days).

Discussion: It is possible that consistent reminders to monitor blood pressure and submit readings would facilitate the establishment of a routine, leading to improved maintenance of healthy blood pressure levels. Furthermore, the study underscores the feasibility of providing cardiovascular healthcare to home-bound patients, demonstrating the potential for effective remote management of chronic conditions. These findings suggest the potential for improving patient outcomes and bridging healthcare disparities through the use of home-based care.

Sessio 4B: Päätöksenteon tuki ja Tekoäly käytännössä (Session in Finnish)

Puheenjohtaja/Chair: Jarmo Reponen, Suomen Telelääketieteen ja e-Health seura (SteHS)

Torstai 14.11.2024 / Thursday 14th November 2024

16:30 – 18:00

4B-1 Päätöksentuki lääkärintyössä / Decision Support in Medical Practice

Johannes Lyytikkä[1], päätoimittaja / Editor in Chief
[1]Kustannus oy Duodecim

4B-2 Tekoälyn implementointi terveydenhuoltoon / Implementing AI in Healthcare

Johan Sanmark[1], TKI-johtaja / RDI Director
[1]*Länsi-Uudenmaan hyvinvointialue*

Scientific rapid presentations:

O-23 Most importantly, AI liberates time for the patient: a classification and prioritization of artificial intelligence uses for wellbeing services counties

Marketta Niemelä[1,2], PhD, Mpsych, Tommi Kemppainen[1], MSc
[1]Nordic Healthcare Group Ltd, Finland; [2]Tampere University, Faculty of Medicine and Health Technology, Tampere, Finland

O-24 Co-development is crucial for implementing large language models for social and health care

Jaana Kokko[1], Roni Huhta[2], Mikko Reinikka[1], Timo Alalääkkölä[1], Miia Jansson[3], Henna Härkönen[3], Santeri Rytky[1], Miika T. Nieminen[1,3], Jarmo Reponen[3], Heikki Mikkonen[1]
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[3]Research Unit of Health Sciences and Technology, University of Oulu, Finland

O-25 Searching informal information after a medical appointment

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[1]Tampere University, Faculty of Social Sciences, Tampere, Finland; [2]University of Eastern Finland, Faculty of Social Sciences and Business Studies, Kuopio, Finland

O-26 Representing relative workload variation in home care teams to facilitate workload management

Joona Koistinen[1], MSc, Päivi Sanerma[1], PhD, RN, Hanna Naakka[1], MNSc, RN
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O-27 Managing Complex Patient Processes Using Process Mining on Electronic Health Records: Preliminary Findings of a Case Study on Multiple Sclerosis

Märt Vesinurm[1], MSc, Valtteri Lipsanen[2], MSc, Lauri Saarinen[1], PhD, Paul Lillrank[1], PhD, Paulus Torkki[3], PhD, Laura Mäkitie[4,5], MD, PhD, Sini M Laakso[4,5], MD, PhD, Miika Koskinen[6,7], PhD
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Corporate presentations:

- SMARTmedi Oy
- Business Turku/ EDIH
- Nuanic Oy

Päätöksentuki lääkärintyössä / Decision Support in Medical Practice

Johannes Lyytikkä[1], MD, EMBA, Full Stack Developer
[1]*Kustannus Oy Duodecim*

Biography Johannes Lyytikkä

Johannes Lyytikkä is a specialist in general medicine and Full Stack developer and has extensive expertise in general medicine, healthcare IT, and Software as a Medical Device (SaMD). Lyytikkä is passionate about solving complex problems and leveraging technology for optimal outcomes and efficiency and committed to combining medical, technological, and managerial skills to enhance healthcare delivery in Finland.

Introduction: Dr. Johannes Lyytikkä is a versatile medical professional, EMBA and a Full Stack JavaScript software developer. Specialist in clinical decision support, he currently holds the role of Editor-in-Chief at Suomalainen Lääkäriseura ja Kustannus Oy Duodecim. He leads the development of Evidence-Based Medicine Electronic Decision Support (EBMEDS), focusing on advancing tools that support clinical decision-making through algorithm coding. Dr. Lyytikkä's work includes the development of digital tools such as Omaolo symptom checkers, along with overseeing the integration of clinical evidence into decision-support frameworks.

Dr. Lyytikkä's experience spans healthcare informatics, software development, and compliance with medical device regulations. His leadership extends across national healthcare IT projects, including his role in the development of Finland's Covid-19 symptom checker, which was awarded for its impact. He has also held various positions in healthcare management, from general practice to chief physician roles, where he improved staffing and operational efficiencies in clinical settings.

With certifications in healthcare informatics and general medicine, Dr. Lyytikkä continues to engage in collaborative efforts to refine clinical decision support systems that enhance patient care and safety. His multidisciplinary background as both a medical doctor and a JavaScript coder uniquely positions him in bridging healthcare with IT innovations to create effective clinical tools for the digital age. His goal is to advance Finnish healthcare through multidisciplinary collaboration and continuous improvement.

Main content of the presentation: In today's fast-paced healthcare environment, clinical decision support systems (CDSS) are essential tools that assist professionals in making informed, evidence-based decisions. This presentation delves into Duodecim Decision Support, a comprehensive CDSS developed by the Finnish Medical Society Duodecim. We will explore how this system operates in practical clinical settings and how it enhances the daily work of healthcare professionals.
Duodecim Decision Support integrates seamlessly with electronic health record (EXPERIENCE) systems, providing real-time access to up-to-date clinical guidelines, tailor made clinical algorithms, workflow accelerating tools and medication databases. Its intuitive interface offers context-specific recommendations and alerts, aiding clinicians in diagnostics, treatment planning, and patient management. By incorporating evidence-based information at the point of care, the system helps reduce errors, standardize care, and improve patient outcomes.

The presentation will include practical demonstrations showcasing the system's functionalities across various medical settings. We will highlight how Duodecim Clinical Decision Support supports preventive care initiatives, facilitates multidisciplinary collaboration, and adapts to local clinical.
By the end of the session, participants will understand the role that Duodecim Clinical Decision Support plays in modern healthcare. They will be equipped with knowledge on how to leverage such systems to deliver high-quality, patient-centered care. This presentation underscores the importance of integrating advanced decision support tools in everyday clinical work to meet the evolving demands of healthcare delivery.

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Tekoälyn implementointi terveydenhuoltoon / Implementing AI in Healthcare

Johan Sanmark[1], TKI-johtaja / RDI Director
[1]Länsi-Uudemaan hyvinvointialue

Biography Johan Sanmark

Johan Sanmark on terveydenhuollon erikoislääkäri ja Länsi-Uudenmaan hyvinvointialueen tutkimus-, kehitys- ja innovaatiojohtaja. Työssään hänen tavoitteenaan on tunnistaa mihin maailma on menossa, ja vauhdittaa hyvinvointialueen kehittymistä oikeaan suuntaan. Teemoja hänen työpöydällään ovat mm. generatiivinen tekoäly, digitaalinen asiointi ja asiakasohjauksen tulevaisuus.

O-23: Most importantly, AI liberates time for the patient: a classification and prioritization of artificial intelligence uses for wellbeing services counties

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Introduction: Artificial Intelligence (AI) holds great promise for the practice of public health and medicine all over the world [1]. Research on how AI is adopted in healthcare has much focused on clinical applications [2], but new generative AI could also significantly relieve secondary type and non-care work in healthcare organisations. DigiFinland conducted an empirical study [3] to identify the most potential use cases and use contexts for AI as well as enablers and challenges of implementation applied in the health domain. The main focus was on the wellbeing services counties, which are the responsible organisations for arranging healthcare and social welfare services in their regions in Finland. Based on interview data, a classification of AI use contexts was outlined, validated and prioritized, as first published in [3] (in Finnish). The classification extends beyond healthcare and medical care to 79rganizing79n79n functions. In this abstract, we further justify the classification and explain the prioritization logic underlying the ordering of the use contexts by their potential. The results help decision-makers and AI developers to design policies for realising the potential of AI in healthcare.

Material and Methods: The empirical study was a two-phase qualitative inquiry. First, 28 participants from different stakeholder groups (e.g., county services management and healthcare professionals, AI developers, technology service providers, regulation) from both public and private sector were interviewed. The data was analysed to identify use cases and to prepare a draft classification of AI use contexts. Second, four group interviews were organised with the total of 14 new participants representing counties and public sector to validate the classification and prioritize the use contexts by their potential. The interviews were carried out during 11/2023-2/2024 in Microsoft Teams by two researchers (or in a few individual interviews, only one) making notes. We analysed the data using thematic analysis to identify the prioritization logic.

Results: Both traditional AI and new generative AI applications were considered. Total of 50 use cases [3] were thematically grouped into six use contexts. Prioritized by their potential, the AI use context classification is: (1) Clinical healthcare, (2) Patient/citizen support and self-care, (3) Management, (4) Support functions, (5) Preventive healthcare and (6) Social welfare services. The prioritization logic was essentially based on six factors: a) saving the professional's time, b) saving costs or resources, c) health risk, d) regulation, e) benefit time span, and e) data availability and accessibility. Almost all identified use cases in all use contexts were valued in their potential to save time (or costs or resources), and the most important was saving time of the healthcare professional for the actual care work or facing the patient. The use contexts differed in terms of factors c)-e). Applying AI in healthcare diagnostics or decision-making was perceived highly potential but having also high health risk and strict medical device regulation which were to be avoided. Patient support and self-care would save healthcare resources, but regulation might restrict useful cases of automation. Management would benefit from predictions and insight from enriched data but require competence development. Support functions would be able to gain quick wins from commercial AI applications but the impact in a longer term is unsure. Preventive healthcare would have huge benefits in a long-term, but mainly at the level of individuals, which is strictly restricted by regulation and also involves ethical questions. Social welfare services would benefit from saving professional's time and letting AI to analyse narrative texts, but the database is underdeveloped, and early interventions and data integration are challenging due to regulation.

Discussion: The results indicate that the implementation of AI will proceed different ways and pace in the six use contexts. The prioritization logic provides insight beyond [3] on the potential of AI in the wellbeing services counties in Finland. The results presumably generalise to other large, public healthcare organisations.

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O-24: Co-development is crucial for implementing large language models for social and health care

Jaana Kokko[1], Roni Huhta[2], Mikko Reinikka[1], Timo Alalääkkölä[1], Miia Jansson[3], Henna Härkönen[3], Santeri Rytky[1], Miika T. Nieminen[1,3], Jarmo Reponen[3], Heikki Mikkonen[1]

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Introduction: Artificial intelligence (AI) has proven to be effective for many applications and the high potential of large language models (LLMs) in the social and health care sector has been demonstrated [1,2,3]. To make the patient care path more efficient in the future, it is imperative to map out where creative AI could be utilized. The AIDocLog project, based on the utilization of LLMs, corresponds to the strategic focus of The wellbeing services county of North Ostrobothnia (Pohde): "Boldly new – Knowledge, research and practical experiments guide towards effective operating models". Pohde has already introduced an operating model where physicians' dictations are recorded with the help of AI-assisted speech recognition software. In the AIDocLog project, we want to promote AI assistance by researching and testing whether AI could prepare a medical report based on the conversation between a physician and a patient. The project is implemented by Pohde, Esko Systems Ltd. And the University of Oulu. The financiers are Sitra and Pohde. The aim of the study was to evaluate the use of local and large language models.

Material and Methods: The project has three different measures: First, administrative tasks are conducted, and the AI application is developed. Esko Systems Ltd. Carries out the technical development. Second, social and health care professionals are involved by discussing the matter and evaluating the AI application. Physicians were recruited from primary care and from specialties of hand surgery, ear, nose and throat diseases, neurology, and urology. Finally, the experiences and evaluations by professionals are being studied. The user experiences, expectations and requirements are documented and shared among the development teams and in scientific dissemination.

Results: The challenge for the local language model was to find a model that performs well with Finnish medical terminology and is useful for professionals. Challenges were the small size of the context in the tried local language models and the slow operation of models in the used environment. As the project progressed, it was therefore decided to utilize cloud technology. In patient interview simulations, cloud based LLMs were able to produce narrative text summaries in Finnish language the physicians considered acceptable. This was true both for short (6 min) and long (20 min) test interviews. The promising results have made physicians interested in participating the workshops and evaluating and supporting the development work.

Discussion: We managed to involve social and health care professionals into co-development and their role was crucial in the research and development. Although the local language model did not fulfil our expectations yet, we believe that it is possible to overcome some of the technical challenges. However, the small position of the Finnish language in the international development of language models is a challenge that probably cannot be overcome without fine-tuning. The same applies even to larger models run in cloud services when industry-specific requirements are concerned. For this reason, local small and easily fine-tunable models will have a place in medical systems in the future, but perhaps alongside larger and more general language models, not as replacements. It is essential that the design is done in collaboration with social and health care professionals so that AI applications can assist with concrete problems and provide both health and economic benefits. Through this project, awareness, and discussion of the use of AI will be increased both within Pohde and nationally.

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O-25: Searching informal information after a medical appointment

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Introduction: This study contributes to the discussions of conditional treatment adherence and treatment plan acceptance after medical appointments. Here, conditional treatment adherence refers to the patients' inclination toward additional information sources before intending to follow with the recommended treatment plan unconditionally. The research focused on informal information sources with a question: *Which determinants underlie the intention to turn to informal information sources in the cases of conditional adherence?*

Formal and informal sources of health information hold importance when people are studying and managing their health and illnesses. Formal information includes consultations from healthcare professionals, guidelines for patients, scientific articles, and instructions found in official sites of healthcare providers. Formal sources offer evidence-based information and can be viewed as a way to practice a duty to increase knowledge of health information. Informal information sources include social media, friends or family, and other non-clinical online and offline discussions. Previous research has indicated that communicating and obtaining health information in everyday discussions are crucial in individual health management. Informal information sources are attractive because they are relatively effortless to obtain via interpersonal conversations. Informal information has also relevance in providing peer support and sharing expertise of experience. However, it is considered problematic for its unfiltered and subjective nature.

Material and Methods: The online survey data were collected in 2022. The primary sample was collected from the Finnish Pensioners' Federation. The invitation was sent to the members whose e-mail addresses were in the database (N = 30,329), resulting in a sample of 1,740 respondents. The sample was complemented by smaller samples from the Finnish Neuro Society, the Finnish Epilepsy Association, and the Organization for Respiratory Health in Finland, resulting in a secondary sample of 195 respondents.

In the total sample (N = 1,935), the mean age of the respondents was 68.35 (SD = 10.01), 64% female. The questionnaire presented eight illustrated scenarios of medical decision-making, where the respondents were asked to identify to the role of the patient. After viewing each scenario, the respondents chose whether they would like to adhere to the treatment plan, reject the treatment plan or conditionally adhere to the treatment plan. After giving a response indicating conditional adherence, the respondent received a list of possible additional information sources and asked to select all the information sources they might use to receive additional information after the medical appointment.

Results: As a majority, 1,137 respondents selected conditional adherence after at least one of the scenarios. Counting the responses as observational units, conditional adherence was selected in one fourth of the responses (n = 3,797).

Additional information was preferably acquired from the attending practitioner during the appointment without the intention to seek second opinions elsewhere. A minority (n = 684) among the conditional adherence selections reported intention to seek additional information from an informal source. As a most popular option, "I turn to a knowledgeable friend/acquaintance for more information" was selected by 36 percent in the total sample. Online forums and blogs were selected by 14 percent and Facebook by ten percent of the respondents.
Out of the sociodemographic background factors, age was found as a significant determinant for searching for informal information after the appointment and to reach a decision about the intention to adhere to the treatment. Older respondents had a higher probability to turn to informal information sources in the cases of conditional adherence. Out of the sociopsychological factors, then, prior experiences in healthcare encounters associated with searching for informal information after the appointment. Respondents who had a history of receiving unexpected treatment recommendations in medical appointments were prone to turn to informal information before accepting the treatment plan.

Conclusion: Patients' prior and negative experiences should be considered at medical appointments when discussing about treatment plans. Learning about and addressing the potential concerns can have a positive effect on treatment adherence. If signs of conditional adherence occur, practitioners are recommended to direct the patient to reliable information sources and perhaps alleviate the pull of informal and potentially unreliable information sources.

O-26: Representing relative workload variation in home care teams to facilitate workload management

Joona Koistinen[1], MSc, Päivi Sanerma[1,2], PhD, RN, Hanna Naakka[1], MNSc, RN
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Introduction: Public home care provision in Finland is facing significant challenges due to austerity policies, aging population, and difficulties with attracting educated workforce. In this context, employee wellbeing is easily undermined, while it also contributes to the attractiveness of home care as a field of employment, creating a vicious cycle. Unplanned variation in relative workload of home care teams is a common culprit to wellbeing among home care employees in such a context characterized by resource scarcity. This issue could potentially be remedied with knowledge management practices and tools, although research on knowledge management interventions in the healthcare context is currently scant [1]. Our objective was to improve the knowledge management capabilities of a Finnish home care organization around this issue.

This knowledge management intervention was conducted as part of Digital expertise and sustainable work for home care (DIGIKH) project. In collaboration with Kanta-Häme wellbeing services county, we developed a tool to track the shift-by-shift deviations of relative workload in home care teams. We represented this with the proportion of visit schedules (one employee executes one visit schedule per shift) that had to be reassigned to other employees in a team, for example due to an employee being absent. Redistributed visit schedules create extra workload for the employees that are working in that shift. The tool works as a combination of a short online survey that shift coordinators of each team fill in daily, and a reporting visualization that summarizes the survey results in one view across days and teams. In this sub-study, we investigate how this intervention affected workload management practices in and across home care teams.

Material and Methods: This study is best described as an interventionist case study involving simultaneously a practical intervention and a study of its impact in the target organization's management practices. Our own understanding on the significance of the intervention developed as we conducted the intervention with the target organization. We also took an inductive qualitative approach to capture a wide range of participant experiences regarding the use and impact of the tool in the organization. This involved a semi-structured survey focusing on how the tool impacted workload management practices and decisions and how it could be improved. In total, the survey included six open questions. The survey was sent to 27 shift coordinators, 25 frontline supervisors, and 5 managers or specialists. We will conduct a qualitative content analysis to the survey results. Currently, the survey is still open for further responses.

Results: The preliminary results indicate that the managers have found the tool helpful in several ways. The tool has enabled evaluating and anticipating the relative workload of each team on a shift-by-shift basis. The tool has also made it possible to compare the relative workload of different teams with a common measure instead of generic subjective accounts. This has facilitated decision-making regarding resource allocation decisions across teams, as the data is transparent across teams. Participants indicated that after the tool was taken into use, practical nurses or visits have been more often moved from one team to another, and visits have been more often assigned to registered nurses if needed. Participants also indicated that seeing the workload situations of other teams transparently has improved communication across teams and lowered the threshold to provide help for other teams. However, shift coordinators also pointed out limitations on how well the measure represents the actual workload in the field due to differences in specific team contexts and interpretations affecting daily survey input.

Discussion: Our study has demonstrated that a knowledge management intervention based on the everyday coordination issues at the level of field operations can help frontline supervisors and managers make more timely resource allocation decisions and facilitate cross-team collaboration in solving acute shift-by-shift resourcing-issues. This approach diverges from typical knowledge management approaches that focus on knowledge production based on the needs and interests of strategic-level actors [1]. The resulting knowledge management practices and tools thus tend to overlook everyday coordination needs of service provision. We call for a more dialogic approach to knowledge management that better accounts for the diverse concerns, interests, and identities of organizational members and stakeholders.

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O-27: Managing Complex Patient Processes Using Process Mining on Electronic Health Records: Preliminary Findings of a Case Study on Multiple Sclerosis

Märt Vesinurm[1], MSc, Valtteri Lipsanen[2], MSc, Lauri Saarinen[1], PhD, Paul Lillrank[1], PhD, Paulus Torkki[3], PhD, Laura Mäkitie[4,5], MD, PhD, Sini M Laakso[4,5], MD, PhD, Miika Koskinen[6,7], PhD

[1]Department of Industrial Engineering and Management, Aalto University School of Science; [2]CGI Oy; [3]Department of Public Health, Faculty of Medicine, University of Helsinki; [4]Brain Center, Department of Neurology, Helsinki University Hospital; [5]Department of Clinical Neurosciences, University of Helsinki; [6]HUS Diagnostic Center, Helsinki University Hospital; [7]New Children's Hospital, Helsinki University Hospital

Introduction: Process mining (PM) has emerged as a valuable approach for analyzing event data recorded in healthcare information systems, offering a context- and process-aware dimension to decision support systems in healthcare [1-3]. However, the systematic uptake of PM in healthcare organizations outside the research context remains limited [1]. Despite the potential of PM to support process improvement in healthcare, the characteristics of organizational and treatment processes, along with heterogeneous data sources, pose challenges to its application in healthcare [4]. The primary objective of this study is to explore the feasibility of PM in the management of complex patient processes, namely multiple sclerosis (MS) at the Helsinki University Hospital (HUS), with an emphasis on identifying procedural deviations from the ideal process.

Material and Methods: First, the ideal care process for people with MS (pwMS) in HUS was elicited together with the HCPs of HUS Neurocenter. Second, a dataset on pwMS in HUS from electronic health records and StellarQ MS quality registry was collected. EHR data was retrieved for all pwMS treated in HUS between the years 2008-2023. The total dataset included 4776 pwMS. Data retrieved included all visits, calls, inpatient episodes, emergency department contacts, diagnoses, radiological examinations, lab tests, patient satisfaction, use of the MS digital care pathway, and prescriptions. Third, the dataset was analyzed using PM algorithms to find the most common processes pwMS patients go through and identify if and how these deviated from the ideal process.

Results: Records were retrieved for a total of 4776 patients, of whom 30.5 % had records available in the quality registry. The mean age (sd) at the end of 2023 was 54.9 (15.66). 20.9% of the patients had at least 2 chronic diagnoses in addition to MS. A small sub-sample of the patients (n = 286), diagnosed between 2018 and 2021 and whose records were available in the quality registry with a confirmed diagnosis of relapsing-remitting MS were separated from the dataset for initial PM analyses. For simplicity, all contacts were classified as one of four labels: (1) 'Neuro elective', (2) other elective, (3) Inpatient, (4) ED. Initial comparative analyses were conducted for this patient subsample between those classified as multimorbid (n = 62) and those not (n = 224). The multimorbid patients had significantly more relapses, ED contacts, inpatient periods, and interestingly more elective neurological contacts.

Discussion: Initial results so far seem to align well with the initial hypotheses. The most patient follow the care pathway to a general extent. We also see that multimorbid patients consume more services (especially ED and inpatient) than non-multimorbid patients. Future studies should further focus on bringing out the potential of PM as a management method, especially by overcoming the challenge of abstraction in categorizing event logs in a managerially relevant way.

References:

[1] Martin, N., Wittig, N., Munoz-Gama, J. (2022). Using Process Mining in Healthcare. In: van der Aalst, W.M.P., Carmona, J. (eds) Process Mining Handbook. Lecture Notes in Business Information Processing, vol 448. Springer, Cham. https://doi.org/10.1007/978-3-031-08848-3_14
[2] Martin, N. et al. (2020) Recommendations for enhancing the usability and understandability of process mining in healthcare. Artificial Intelligence in Medicine, 109;191962.
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GALLERY WALK: demonstrations to digital solutions

Friday 15th of November
9:30 – 11:00

1. TAMK Sote Virtual Lab (room A08):

In the Virtual Lab for Social and Health Care we develop, test and put forward ideas on tomorrow's digital and intelligent technologies related to basic health care, safe and well-performing home environment, remote care and rehabilitation, telemedicine, and mobile healthcare services.

TAMK Sote Virtual Lab (Sali A08):
Tampereen ammattikorkeakoulun oppimis- ja kehittämisympäristö, jossa kehitämme, testaamme, tutkimme ja opetamme monialaisesti ja käyttäjäkeskeisesti etä-, virtuaali ja digitaalisia ratkaisuja ja palveluita.

2. Tampere University, Research and Testing Services for Physiological Measurements, and Current Research Projects in the eHealth and eWelfare Domains (room A07):

We will present research conducted at the Health and Assistive Technology Laboratory of Tampere University. Additionally, we will introduce two major EU-funded international research efforts that started in 2024 (themes: digital twins, modelling, federated data analysis), and the newly launched Tomorrow's Sports and Health Campus project, funded by the Council of Tampere Region, that involves a wide network of institutes working with SMEs on wellness and preventive solutions in the Pirkanmaa region.

Tampereen yliopisto, Fysiologisten mittausten tutkimus- ja testauspalvelut sekä ajankohtaiset tutkimushankkeet eTerveyden ja eHyvinvoinnin alueilla (Sali A07):
Esittelemme Tampereen yliopiston Health and Assistive Technology -laboratoriossa tehtävää tutkimusta ja yritysyhteistyötä. Lisäksi esittelemme kaksi merkittävää EU-rahoitteista kansainvälistä tutkimushanketta, jotka alkoivat vuonna 2024 (teemat: digitaaliset kaksoset, mallinnus, hajautettu data-analyysi), sekä juuri käynnistyneen Tomorrow's Sports and Health Campus hankkeen, jota rahoittaa Pirkanmaan liitto ja johon osallistuu laaja verkosto toteuttajapartnereita tehden yhteistyötä alueen pk-yritysten kanssa hyvinvoinnin ja ennaltaehkäisevien ratkaisujen parissa.

3. Pirha, DigiClinic (room A06):

At the information booth, you can explore the diverse digital services and interaction options of Finland's largest wellness area, hear reporting details related to the solutions, and learn about the operating model of Pirkanmaa's digital clinic.

Pirha, DigiClinic (Sali A06)
Esittelypisteellä voi tutustua Suomen suurimman hyvinvointialueen monipuolisiin digitaalisiin asiointimahdollisuuksiin ja palveluihin, kuulla raportointitietoa ratkaisuihin liittyen ja tutustua Pirkanmaan digiklinikan toimintamalliin.

Session 5: eHealth Economics (session in English)

Puheenjohtaja/Chair: Eero Latva-Rasku, Finnish Society of Telemedicine and eHealth (FSTeH)

Perjantai 15.11.2024 / Friday 15th of November 2024

8:30 – 9:30

5-1 Evaluating effectiveness and cost-effectivess of digital healthcare technologies

Mika Kortelainen, Professor
Finnish Institute for Health and Welfare

5-2 Assessing the (cost)effectiveness of eHealth/Digital solutions

Janne Martikainen, Professor
University of Eastern Finland

Corporate presentations:

- Business Turku / EDIH

Evaluating effectiveness and cost-effectivess of digital healthcare technologies

Mika Kortelainen[1,2,3,4], PhD
[1]*Turku School of Economics, University of Turku*
[2]*Finnish Institute for Health and Welfare, Helsinki*
[3]*InFLAMES Research Flagship Centre, University of Turku*
[4]*INVEST Research Flagship Centre, Finnish Institute for Health and Welfare*

Biography of Mika Kortelainen

Mika Kortelainen is a professor of health economics at the University of Turku and a research professor at the Finnish Institute for Health and Welfare (THL). His research focuses on assessing the effectiveness and impacts of social and healthcare services, with a strong emphasis on digital healthcare technologies and their role in enhancing healthcare efficiency. Dr. Kortelainen has led numerous high-profile research projects funded by the Finnish government and various foundations, examining issues from healthcare digitalization to the implications of competition and incentives in healthcare markets. With extensive experience in econometric analysis and health economics, his work contributes to the understanding and improvement of healthcare services in Finland and beyond.

Main content of the presentation

Dr. Kortelainen's keynote will present findings from a new research project examining the use, production, and effectiveness of digital healthcare services. Central to this study is the establishment of a comprehensive and up-to-date data infrastructure that enables both descriptive and experimental research on digital healthcare. This infrastructure provides a unique basis for understanding digital service utilization patterns and the characteristics of users across different demographic and geographic segments in Finland.

The project employs detailed descriptive analyses to chart the adoption and usage trends of digital health services, offering insights into how these services differ in accessibility and utilization compared to traditional in-person healthcare services. Furthermore, the project rigorously assesses the effectiveness of digital healthcare solutions using both randomized controlled trials (RCTs) and quasi-experimental designs. These methods allow for robust impact evaluations, providing stakeholders with valuable evidence on how digital services influence overall healthcare demand and costs. Through this research, Dr. Kortelainen's team addresses critical knowledge gaps in digital health, paving the way for more informed decision-making in digital healthcare implementation and policy.

References:

[1] Haaga, T., M. Herzig, M. Kortelainen, O. Nokso-Koivisto, T. Saxell, & L. Sääksvuori (2024). Digitaalisten terveyspalvelujen käyttö, käyttäjät, tuotanto ja vaikuttavuus: Esiselvitys. Sosiaali- ja terveysministeriön julkaisuja 2024:12. http://urn.fi/URN:ISBN:978-952-00-5665-0

[2] Haaga, T., M. Kortelainen, O. Nokso-Koivisto, T. Saxell, L. Sääksvuori (2024) Impact of Direct-to-Consumer Telemedicine on the Utilization of Primary Care: A Pre-Analysis Plan. https://osf.io/khgds/

[3] Haaga, T., M. Kortelainen, O. Nokso-Koivisto, T. Saxell, M. Seppä, L. Sääksvuori (2024) Digital Clinics and the Utilization of Primary Care: Pre-Analysis Plan and Power Analysis for a Randomized Trial. Unpublished working paper.

Assessing the (cost)effectiveness of eHealth/Digital solutions

Janne Martikainen[1], PhD
[1]University of Eastern Finland

Biography of Janne Martikainen

Janne Martikainen, PhD (Health econ) is a full professor of pharmacoeconomics at University of Eastern Finland (UEF) and a head (Health Sciences) of UEF House of Effectiveness. He leads a research group at UEF focusing on data-driven health economics and outcomes research. The group use a multidisciplinary approach that applies different computational methods and multiple data sources, including electronic health records, genomic, metabolomics, survey, and other real-world data with a focus on the health economic aspects of precision and digital population health management approaches in the prevention and treatment of non-communicable diseases, such as cardiovascular, renal, and metabolic diseases, as well as memory disorders. Currently, another focus area is the development of Productivity-Adjusted Life Year (PALY) metrics as a policy-relevant outcome measure (a collaboration with Monash University, Australia) [1].

Introduction: Digital Health Solutions (DHSs) offer promising avenues for enhancing patient outcomes and healthcare efficiency. Yet, their integration into healthcare systems faces complex hurdles. This presentation delves into the challenges and considerations for assessing the cost-effectiveness and value of DHSs, as well as their market access pathways across the EU.

Main content of presentation: The presentation will cover the following key topics: 1) challenges in bringing new DHSs to market, 2) current approaches for assessing the clinical and economic value of DHSs and identifying gaps, 3) pricing and reimbursement strategies in the EU using Germany's DiGA framework as a leading model for digital health regulation, and methodological success factors for positive care effects by identifying factors that contribute to clinically meaningful and economically favorable outcomes in DHS implementations. Finally, Finnish experiences to generate positive care effects for a DHS will be presented [2, 3].

Recommendations for future research: Future research is needed to enhance our understanding of DHSs as a new class of interventions with distinct value propositions compared to traditional pharmaceutical treatments [4]. Moreover, new data-driven methods are necessary to extrapolate short-term care benefits into long-term outcomes, supporting the health economic evaluation of DHSs.

References:

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Session 6A: Data Access and Data Quality (session in English)

Puheenjohtaja/Chair: Vesa Jormanainen, Finnish Society of Telemedicine and eHealth (FSTeH)

Perjantai 15.11.2024 / Friday 15th of November 2021

11:00 – 12:30

6A-1 European health data space and preparatory actions

Markus Kalliola[1], Project manager
[1]*Finnish Innovation Fund SITRA*

6A-2 Experiences on nation-wide health data harmonization: commitment to shared goal, data quality and federated analyses

Tarja Laitinen[1], Senior Medical Advisor
[1]*University of Helsinki, Finland*

Scientific rapid presentations

O-28 Assessment and reimbursement models for digital health technologies in different European countries

Jari Haverinen[1,2], Raija Järvinen[1], Teemu Mustola[1], Petra Falkenbach[1]
[1]*Finnish Coordinating Center for Health Technology Assessment (FinCCHTA), Oulu University Hospital, Oulu, Finland;* [2]*FinnTelemedicum, Research Unit of Health Sciences and Technology, Faculty of Medicine,University of Oulu, Oulu, Finland*

O-29 Compatibility of medical risk calculators with data from Finnish National Health Record System

Viljami Männikkö[1,2], Klaus Förger[1], Henna Urhonen[1]
[1]*Atostek Oy, Hermiankatu 3, 33720 Tampere;* [2]*Faculty of Medicine and Health Technology, Tampere University, Kauppi Campus, Arvo Building, Arvo Ylpön katu 24, 33520 Tampere*

Corporate presentations:

- Sensotrend
- Laurea/ ETAPLATE

European health data space and preparatory actions

Markus Kalliola[1], Program Director
[1]*Finnish Innovation Fund SITRA*

Biography Markus Kalliola

Kalliola is a program director in Future well-being solutions program in The Finnish Innovation Fund Sitra. He is the coordinator of Joint Action Towards The European Health Data Space 2 (TEHDAS 2) and Value from Nordic health data (VALO) projects. Both project aim for the successful implementation of the European Health Data Space regulation.

Experiences on nation-wide health data harmonization: commitment to shared goal, data quality and federated analyses.

Tarja Laitinen[1], MD, PhD
[1]FIMM, Helsinki University, Finland

Biography Tarja Laitinen

Dr Tarja Laitinen has been the Senior Medical advisor at Helsinki University since March 2024. Before that she has held several positions in the academia and biotech industry. She has actively participated in the development of Biobank Research and Clinical Informatics in Finland for several years.

Background: Real-world data (RWD) is a collective term for medical data gathered in daily clinical practice. Real-world evidence (RWE) has been used in health care to identify low-value treatments and the best target population for the high-value treatments which frequently are very expensive and effective only in a small proportion of the patients. The drug authorities can also monitor and evaluate the post market safety and effectiveness of approved drugs.

Health data is very sensitive information. In addition to many legal restrictions (Act on Secondary Use of Health and Social data, GDPR, Biobank Act), poor interoperability between registry holders both nationally and across boarders has slowed down the use of RWD. During the last decade the global OHDSI community has developed the international OMOP vocabulary and common data model for health care research and decision making [1]. That has improved the possibilities to run federated study models in multiple centres at the same time without sharing personal data. In future this approach can significantly improve the quality and comparability of RWD studies.

To use RWD to generate evidence, data must be of sufficient quality. The ways of measuring the data quality are now developing quickly. Data quality consists of three components: (1) conformance (do data values adhere to do specified standard and formats?; subtypes: value, relational and computational conformance); (2) completeness (are data values present?); and (3) plausibility (are data values believable?; subtypes uniqueness, atemporal; temporal) [2].

We started FinOMOP consortium in year 2020 by jointly mapping the Finnish medical vocabularies into OMOP and developing similar OMOP databases in the University Hospitals, in the Finnish Institute of Health and Welfare, and in the University of Helsinki (FIMM). Now FinOMOP is one of the ODHSI hubs and data partner and thus, able to organize and participate international RWE studies.

Main content of the presentation: In my talk I will discuss our experiences in health data curation and OMOP harmonization for secondary use, data quality control and assurance, and federated analyses done so far in Finland.

References:

[1] OHDSI – Observational Health Data Sciences and Informatics
[2] Kahn MG, Callahan TJ, Barnard J et al. A Harmonized Data Quality Assessment Terminology and Framework for the Secondary Use of Electronic Health Record Data. DOI: 10.13063/2327-9214.1244

O-28: Assessment and reimbursement models for digital health technologies in different European countries

Jari Haverinen[1,2], MSc, MHSc , Raija Järvinen[1], Master of Health Care, RNC, Teemu Mustola[1], B.Sc, RNC, Petra Falkenbach[1], MSc

[1]Finnish Coordinating Center for Health Technology Assessment (FinCCHTA), Oulu University Hospital, Oulu, Finland; [2]FinnTelemedicum, Research Unit of Health Sciences and Technology, Faculty of Medicine,University of Oulu, Oulu, Finland

Introduction: To promote the adoption of evidence-based DHTs, some EU countries have developed national health technology assessment (HTA) models and related reimbursement mechanisms [1]. The purpose of this study was to investigate the similarities and differences between the HTA and reimbursement models of the identified EU pioneer countries. This study was conducted as part of the Finnish Recovery and Resilience Plan, funded by the European Union's NextGeneration EU program.

Material and Methods: Germany, Belgium, and France were identified as the EU frontrunners where HTA and related reimbursement models were already in use for DHTs [1-5]. Information about the key features of different HTA and reimbursement models was gathered from the websites of organizations conducting assessments, guidelines, and scientific articles. In the first phase, the key features of each HTA model were listed and analyzed. In the next phase, the characteristics of the reimbursement models were analyzed.

Results: Germany has the DiGA process for digital therapeutics (DTx) and the DiPA process for digital nursing applications, both covering Class I and Iia medical devices, with DiPA also allowing non-medical devices. France's PECAN model covers DTx and remote patient monitoring applications (medical devices, all risk classes). Belgium's Validation Pyramid model includes mHealth applications (medical devices, all risk classes) that allow patients to share health-related information with healthcare professionals, with or without sensors. Germany's HTA models cover the most HTA domains, and all models, except DiPA, include both preliminary and permanent reimbursement pathways. A key difference is that in the Belgian Validation Pyramid model, the mHealth application as part of the entire care pathway is assessed and reimbursed, compared to other models where a single DHT is assessed and reimbursed. Compensation mechanisms for DHT vendors vary between models.

Discussion: CE-marked medical devices are the starting point for assessments and reimbursement in all models, except that DiPA also allows non-medical devices. Preliminary reimbursement models allow DHT vendors to collect evidence in situations where the level of evidence is not yet sufficient. Due to the differences between the models, there is a need for better harmonization of assessment criteria at the EU level [6].

References:

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O-29: Compatibility of medical risk calculators with data from Finnish National Health Record System

Viljami Männikkö[1,2], MSc, Klaus Förger[1], PhD, Henna Urhonen[1], MSc
[1]Atostek Oy, Hermiankatu 3, 33720 Tampere; [2]Faculty of Medicine and Health Technology, Tampere University, Kauppi Campus, Arvo Building, Arvo Ylpön katu 24, 33520 Tampere

Introduction: Medical risk calculators are effective tools in preventative healthcare. Kanta Services is a Finnish national healthcare data registry that contains data from almost the whole Finnish population [1]. This work presents an estimate if the input variables of medical risk calculators can be found from Kanta. With medical risk calculators, the development of an individual's health can be monitored by individuals themselves, by healthcare professionals, or as a result of selective mass analysis. This helps to detect high-risk potential for certain diseases at an early stage. In many cases, medical risk calculators are not developed with real-world data produced in everyday patient care and variables are more commonly available in the development phase than in real-world cases. Adding new information to the national patient data repository system requires changes in multiple levels from data definitions and patient information systems to everyday patient care to achieve situations where variables are comprehensively available for medical risk calculation.

Materials and Methods: Our study aims to analyze if evaluation of medical risk calculators and automated real-time risk calculation for individuals would be possible using the Kanta Services as a data source. First, we list input variables of existing risk calculators and after that, we categorize these variables according to the data types recorded in Kanta. We collected input variables of all Framingham risk calculators that are among the most popular risk calculators, a few Finnish risk calculators, and 7 other randomly selected risk calculators. In total, we analyzed the occurrences of the input variables of 24 different risk calculators. The analysis of data availability utilized related research where 96,200 patients' medical histories were retrieved from the Kanta Patient Data Repository (PDR) and the availability of key health information was analyzed [2].

Results: As a result of the risk calculator analysis, we ended up with 7 different input variable categories: basic information, medication, diagnoses, procedures, measurements, lifestyle, and family-related. Several of these categories match with key health information defined by Finnish authorities [3]. The largest category from the perspective of the number of unique input variables was the "Diagnoses" category that contained 21 different unique input variables. As expected, the most common input variables were "Age" and "Gender" from the basic information category. The "Age" input variable occurred in 23 risk calculators. Based on these categorizations, we analyzed the occurrence of each category in the Kanta Services. As a result of this analysis, we discovered that the input variables of the categories "Basic Information", "Medication", and "Diagnoses" can be found in almost all cases from the Kanta Services. The availability of data in the categories "Procedures" and "Measurements" must be analyzed separately for each input variable. The Kanta PDR contains data on measurements and procedures, but the data availability highly depends on the type of measurement or procedure. "Lifestyle" and "Family related" categories contained input variables that are not currently supported by the Kanta Services. Information about relatives is stored in Finland by the national Digital and population data services agency but at least for now, it is not available for research due to data usage laws.

Discussion: Kanta Services has the potential to be an excellent real-world nationwide healthcare data source for risk calculator evaluation and automated risk analysis. By developing the data structures of Kanta Services further and improving data quality, we would achieve a data source that covers all Finnish persons and would support many different risk calculators. In some cases, it would be better also to develop risk calculators by utilizing only the data of Kanta Services because in that case, the risk calculator would already use variable types that are available in Kanta, and the prevalence of input variables can be considered right from the development stage. Kanta PDR contains large amounts of free text information written by healthcare professionals during patient visits. That information can contain valuable data for medical risk calculators and thus, data extraction from free text can already produce better results.

References:

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Sessio 6B: Digiratkaisujen näyttö käytännössä (Session in Finnish)

Puheenjohtaja/Chair: Juhamatti Huusko, Suomen Telelääketieteen ja e-Health seura (SteHS)

Perjantai 15.11.2024 / Friday 15th November 2024

11:00 – 12:30

6B-1 Miten voimme tutkia terveydenhuollon digiratkaisujen näyttöä? / How Can We Evaluate the Evidence for Digital Health Solutions?

Paulus Torkki[1], Associate Professor
[1]*Helsingin yliopisto*

6B-2 Mitä kokemuksia meillä on terveydenhuollon digitaalisten ratkaisujen arvioinnista? / What Are Our Experiences with Evaluating Digital Health Solutions?

Petra Falkenbach[1], Head of Assessment
[1]*FinCCHTA, Pohde*

Scientific rapid presentations

O-30 Leveraging Digital Twin Technology for Healthcare: Mapping Potential Benefits and Impacts through a Hypertrophic Cardiomyopathy Case Study

Annariina Koivu[1,2], Mark van Gils[1], Antti Ahola[1], Jari Hyttinen[1]
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O-31 Participatory design in the development of a mobile application for the NFBC1966 follow-up study: initial steps in the STAGE project

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O-32 Value Co-creation and Co-destruction in Digital Health Services: Preliminary Findings of Systematic Review

Elina Laukka PhD, RN[1,2], Tuure Tuunanen D.Sc.[2], Miia Jansson PhD, RN[3], Minna Vanhanen PhD, RN[4], Nina Hirvonen BSc[5], Jenni Palukka BSc[5], Märt Vesinurm MSc[5], Paulus Torkki, PhD[1]
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O-33 Ecosystem Supporting Commercialization of Digital Health Innovations

Pauliina Tryykilä[1], MSc, Beng. Elina Kontio[1], PhD
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Corporate presentations:

- Business Turku/ EDIH
- MOKUVE - Multidisciplinary Rehabilitation Network
- Länsi-Uudenmaan hyvinvointialue

Miten voimme tutkia terveydenhuollon digiratkaisujen näyttöä? / How Can We Evaluate the Evidence for Digital Health Solutions?

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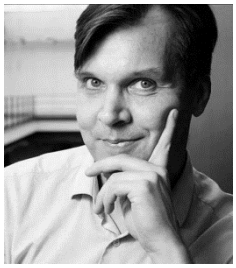
Biography Paulus Torkki



Paulus Torkki is an associate professor of Healthcare Operations Management. His research interests are value-based healthcare and performance measurement and improvement in health care services.

Mitä kokemuksia meillä on terveydenhuollon digitaalisten ratkaisujen arvioinnista?
What Are Our Experiences with Evaluating Digital Health Solutions?

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Biography Petra Falkenbach

M.Sc Petra Falkenbach work as Head of Assessment in FinCCHTA, at the North Ostrobothia wellbeing services county. Her responsibility is managing the operations on the Finnish Coordinating Center for Health Technology Assessment, FinCCHTA. Her background is in health economic, and she is particularly interested in de-implementation of low-value care.

Background: "Health Technology Assessment (HTA is a multidisciplinary process that uses explicit methods to determine the value of a health technology at different point in its lifecycle. The purpose is to inform decision-making in order to promote an equitable, efficient, and high-quality health system". [1]. HTA included the assessment on technology's effectiveness, safety, costs, ethical, 96rganizing96n96n, social and legal issues. Although the HTA is very bord, digital technologies special questions, like data security and protection are not covered. Based on that, experts from FinCCHTA and University of Oulu, have developed Digi-HTA for assessment digital products and services used in social and health services [2]. When Digi-HTA development begin in 2018, there was no other methods to assessment digital health care product. In the last year some other assessments has also bee developed, like Germany's DiGA [3].
Digi-HTA assessment has five main domains. In addition to these, other issues are reviewed in the assessment, such as interoperability, technical functionality and, if necessary, matters related to AI and robotics. The assessment is based on information provided by the company, supplemented by a literature review and experts reviews. [4].

Main content of the presentation: In this presentation, I give a short introduction to digi-HTA domains, process, and conclusions. After that I'll go over what we have learned from doing these assessments over the past four years. The digi-HTA process has been part of our work since 2020, and currently we have assessed 15 products. There has been some shortcoming in the five main domains of digi-HTA. In terms of effectiveness, the quality on the research evidence has been variable or there has been very little of it. In the cost section, information received from the companies has been sufficient, but a cost-effectiveness analysis cannot be produced, because effectiveness information is scarce. In data security and protection biggest shortcoming has come out in passwords management and updates. At the end of the presentation, I will give examples how companies and wellbeing counties can use assessment reports in their own activities.

Recommendation for future research: In the future, we need high-quality research on the effectiveness of digital health care products.

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O-30: Leveraging Digital Twin Technology for Healthcare: Mapping Potential Benefits and Impacts through a Hypertrophic Cardiomyopathy Case Study

Annariina Koivu[1,2], PhD, MSc, MA, Mark van Gils[1], PhD, MSc, Antti Ahola[1], PhD, MSc, Jari Hyttinen[1], PhD, MSc.

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Introduction: Digital twin (DT) technology, a key advancement of the 4th and 5th industrial revolutions, transcends the limitations of physical entities by overcoming constraints related to time, space, cost, and security [1]. Recognized as a top strategic technology trend, DTs have been successfully applied across various sectors and are now also emerging in healthcare. The HEU project SMASH-HCM [2] explores the potential of DT technology to enhance personalized healthcare, focusing on hypertrophic cardiomyopathy (HCM). HCM is the most common inherited cardiac disorder. HCM, with a prevalence of 1:200-1:500, is a multifactorial disease affecting multiple organs and systems, leading to symptoms such as chest pain, arrhythmias, and potentially sudden cardiac death.

Material and Methods: SMASH-HCM is formed by 8 research partners, 3 hospitals, 3 SMEs, and a global health-technology corporation in collaboration with patients. The project will develop a DT platform to dramatically improve HCM stratification by integrating multilevel and multiorgan dynamic biophysical and data-driven models into a three-level deep phenotyping approach. With its results planned to be validated in clinical pilots, SMASH-HCM advances the state of the art in human DTs by utilising in-vitro tools, in-silico from molecular to systemic level models, structured and unstructured data analysis, explainable artificial intelligence – all integrated into a decision support solution for both healthcare professionals and patients.

Results: Early results include identification of clinical needs elicited from HCM specialists and turned into functional requirements for the platform. These relate to e.g., diagnostic and referral challenges, monitoring of asymptomatic patients, risk stratification for arrhythmias, and early detection of deterioration and complications. We have also made progress towards developing in-vitro models including HCM patient cell lines and in-vitro cardiac tissue models, as well as the first line of HCM in-silico models of the cellular electrophysiology, biomechanics and energetics from cell level to patient whole heart and vascular responses [3,4].

Discussion: The application of DT in HCM can revolutionize diagnosis, prognosis, and treatment by enabling precise stratification and personalized disease management. This represents a significant advancement, since at present HCM patients are treated similarly although the disease is diverse both in pathophysiology and in clinical outcomes. Further potential gains include faster HCM device and drug development and testing due to improved stratification. Patients can benefit from more personalized lifestyle guidance, and ultimately from better health outcomes through non-invasive methods. From a clinical perspective, DTs offer tools for decision-making, risk assessment, and workflow optimization, consequently improving care processes and patient management. Health systems can benefit from cost savings, timely and accessible care, and a shift towards precision and preventive care.

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O-31: Participatory design in the development of a mobile application for the NFBC1966 follow-up study: initial steps in the STAGE project

Erika Jarva[1], PhD, post-doctoral researcher, Tiia Yrttiaho[1], MSc, doctoral researcher, Minna Isomursu[2], PhD, Professor

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[2]Empirical Software Engineering in Software, Systems and Services, Faculty of Information Technology and Electrical Engineering, University of Oulu, Finland

Introduction: Participatory design has been identified as designing systems together with the users not for the users by acknowledging the users' characteristics and needs [1]. In healthcare, participatory design, including co-design, co-creation and patient and public involvement (PPI), has been used for example in designing digital health solutions for disease management and health promotion [1,2] and in developing and implementing AI technologies in healthcare practices [3]. The STAGE project aims to produce new, person-centred technologies to facilitate active and healthy ageing in the quest to predict and prevent multimorbidity by using a life-course approach [4]. The purpose of the first participatory design methods as part of the STAGE project was to attain healthcare professionals and researchers' views and wishes regarding the contents of a mobile application developed to monitor the user's health and wellbeing. The mobile application will be piloted in the Northern Finland Birth Cohort 1966 (NFBC1966) 60-year-old follow up study's data collection.

Material and Methods: An electronic survey containing open-ended questions was developed ad hoc in the research group to address the research purpose. Minor amendments were made after piloting the survey with two researchers. A link to the survey was distributed via email to healthcare professionals and researchers affiliated with the Faculty of Medicine at University of Oulu. Simultaneously another survey was distributed which invited the participants to contribute to the planning of the next NFBC1966 follow-up study. All in all, 28 responses were gathered between April and June 2024. The responses have been analysed with thematic analysis [5].

Results: Preliminary findings suggest that healthcare professionals and researchers wish for a variety of different features in the application which allow active and passive data entry, linkage to other devices and a contact possibility to the user's healthcare provider. Attractiveness through ease of use and automation was perceived important. The information collected with the application should consider the physical, mental and social aspects of health and wellbeing.

Discussion: Inclusion of healthcare professionals and researchers to mobile application development has the potential to increase their interest of using the application for clinical and research purposes and recommending the application during patient encounters. Next steps in the STAGE project aims to deepen participatory design by involving patient and public representatives to mobile application development and implementation to further increase the inclusivity and quality of the research [2,6].

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O-32: Value Co-creation and Co-destruction in Digital Health Services: Preliminary Findings of Systematic Review

Elina Laukka[1,2] PhD, RN, Tuure Tuunanen[2] D.Sc., Miia Jansson[3] PhD, RN, Minna Vanhanen[4] PhD, RN, Nina Hirvonen[5] BSc, Jenni Palukka[5] BSc, Märt Vesinurm[5] MSc, Paulus Torkki[1], PhD

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Introduction: Technological advancements and digital transformation are redefining value creation, forging stronger connections between healthcare providers, professionals, and patients through digital health services (DHS). This interconnectedness enables value co-creation (VCC), through which professionals and patients can significantly contribute to health outcomes as partners [1]. However, complex interactions in DHS can lead to value co-destruction (VCD), where patient-provider interactions diminish service quality, patient experience, and organizational reputation. This issue can arise from technical problems, inadequate patient care, or unclear communication channels, ultimately failing to deliver the intended value [2]. An earlier review by Peng et al. [3] focused on VCC in healthcare but did not address VCD. Given the rapid development of DHS, a more current review is necessary to better understand this phenomenon. The aim of the systematic review was to understand the antecedents, decisions, and outcomes (ADO) of VCC and VCD in DHS using ADO framework by Paul and Benito [4].

Material and Methods: The searches were conducted to Scopus and Medline in spring 2024, which resulted in 842 articles of which 32 were included for the final analysis. Our review included studies published between 2020 and 2024, whereas as earlier review by Peng et al. [5] covered the years 2008 to 2019. The article selection, screening, quality assessment, and data extraction processes were conducted by two independent reviewers following Joanna Briggs Institute's guideline for mixed method review [5].

Results: Our review identified 32 scientific studies on VCC or VCD in DHS from 2020 to 2024. All these studies focused on VCC, with only three also addressing VCD, none exclusively on VCD. Most of these studies were published in Italy (n=8), China (n=6), and the USA (n=6). The hypothetical-deductive method was the most commonly used research approach. Additionally, most studies were based on Service-Dominant Logic (SDL) as their theoretical foundation. We will further classify the data utilizing antecedent, decisions, and outcomes -framework (ADO) [4].

Discussion: In conclusion, the research interest towards VCC and VCD within DHS has increased remarkably during the past years. An earlier review by Peng et al. [3] identified 28 publications on VCC in healthcare, covering both offline and online contexts from 2008 to 2019. In contrast, our review identified 32 publications from 2020 to 2024, focusing solely on the online context. Our study proposes that VCD has been far less scrutinized than VCC, and it deserves greater attention. VCD can diminish value, so it's important to identify which activities or resources may cause it.

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O-33: Ecosystem Supporting Commercialization of Digital Health Innovations

Pauliina Tryykilä[1], MSc, Beng. Elina Kontio[1], PhD
[1]Turku University of Applied Sciences, Faculty of Engineering and Business, School of ICT

Introduction: This study was a sub-study of The Digital Health Knowledge Network (DTHOSVE) project which main goal is to prepare the establishment of a national network and network operator for digital health and well-being in Finland. The project was initiated based on a report by the Ministry of Social Affairs and Health, which indicated a need for national coordination in the field [1]. This study aimed to identify services supporting the commercialization of digital health solutions and analyzed these services from the industry's perspective and explored the best practices and models to foster the sector's development.

Material and Methods: To gather insights for this study, we conducted interviews with various stakeholders involved in the commercialization of digital health solutions. The interviewees (n=10) included representatives from testbed services, consultancy firms, industry organizations, and other relevant entities. The interview framework was developed in collaboration with the project team, and it focused on the efficient use of R&D resources, skills needed, better utilization and commercialization of research findings, constantly changing environment and enhancement of public-private collaboration. Additionally, a Webropol survey (n=10) was sent to the participants of a testbed network meeting in Turku in November 2023. The survey focused on identifying challenges in the commercialization of innovations and potential solutions.

Results: The health tech ecosystem involves various public and private entities that provide services to aid the commercialization of digital health innovations. The commercialization pathway involves multiple stages, from early idea evaluation to prototype testing and final product validation. Early-stage testing in the development process to avoid costly late-stage changes is crucial for companies, and various testbed services are established to address this issue. Coordination among these services is crucial to avoid confusion and inefficiencies.

Agile development methods are commonly used in software development but often conflict with the stringent regulatory requirements of the health sector. Therefore, early involvement of clinical experts is essential to refine innovations and ensure their market readiness.

One significant challenge preventing the spread of new technologies in the healthcare is the public procurement and implementation process. Companies often experience frustration when successful pilot projects do not lead to procurement, even the procurement was not the purpose of the pilot in the first place. To address this, clearer definitions of testbed services and better integration of procurement processes were suggested. Another major challenge is the complex and evolving regulatory landscape, which can be particularly confusing for startups. The development of early regulatory strategies and enhanced support to help companies navigate these regulations are essential. Funding is another critical area of concern. There is a need for more comprehensive and health tech sector specific funding instruments, especially to support the transition from research to commercialization. Additionally, the sector was noted to be fragmented, with varying levels of support across different regions. To improve efficiency and impact, national coordination and regional specialization was deemed necessary.

Discussion: This study highlights the importance of strategic planning, early expert involvement, and robust coordination among stakeholders to overcome the challenges in commercializing digital health innovations. By addressing these issues, the digital health sector in Finland can enhance its competitiveness and innovation capacity.

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Session 7: Lesson learned in assessing the impact of digital services of health care (session in English)

Puheenjohtaja/Chair: Vesa Jormanainen, Finnish Society of Telemedicine and eHealth (FSTeH)

Perjantai 15.11.2024 / Friday 15th of November 2024

13:30 – 14:30

7-1 Health in the Digital Age

Eric Sutherland[1], Adjunct Professor
University of Victoria, Canada; Life Fellow, Royal Society of Medicine, UK; Director, International Society for Telemedicine and eHealth, Switzerland

7-2 Do we have evidence, if it is beneficial to organize health care services digitally?

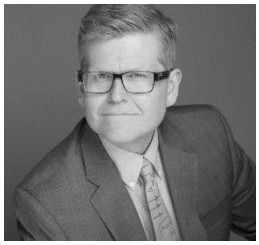
Gro Rosvold Berntsen[1], Professor, Dr.
Norwegian Centre for E-health Research, Tromsoe, Norway

Health in the Digital Age

Eric Sutherland[1,2,3], Senior Health Economist

1University of Victoria, Canada; [2]Life Fellow, Royal Society of Medicine, UK; [3]Director, International Society for Telemedicine and eHealth, Switzerland

Biography Eric Sutherland



Eric is a Senior Health Economist leading the OECD's work in Digital Health, bringing together policy guidance for digital tools, integrated data, and responsible analytics including artificial intelligence.

Background: Digitalisation is transforming health systems around the world. In many countries that transformation started many years ago with advancement in hospital information systems and development of electronic health records. Many health systems are now moving from the first generation of 102rganizing102n102n into the second generation – as the initial systems that were procured in the 00's and 10's are being refreshed or upgrades. With this second-generation implementation of digital tools, there is an opportunity to correct the mistakes from the implementation of 102rganizing102n102n it the first wave – where the focus was on facility-centred procurement of technology where the second generation can focus on the person-centred curation of health data that benefits individuals and communities.

Main content of the presentation: This presentation will explore the potential human and economic impacts of a modern approach to 102rganizing102n102n; the imperative to prioritise and incent the creation of networks; and funding models that support the development and scale of innovation. The discussion will continue to look at opportunities to streamline processes, shift to a minimization-of-harms approach, and meaningfully engage the people most impacted by 102rganizing102n102n – the public and health providers.

Do we have evidence, if it is beneficial to organize health care services digitally?

Gro Rosvold Berntsen[1], MD, PhD
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Biography Gro Karine Rosvold Berntsen

Dr. Gro Rosvold Berntsen, (MD, Dr.med.) is professor at the Norwegian center for eHealth research. She teaches at the department of community medicine at UiT – The Arctic University of Norway. She is a leader of research and implementation initiatives in the areas of digitally supported Person-centered Care systems, with a special focus on persons with multimorbidity.

Introduction: The vision of a fully interoperable information system, which serves to support digitally organized health services is not new. The dream is that the information systems should capture the data automatically, "glue" the information that arises from the various fragments of the care system together, and present and analyse the data in such a way that it gives added value to both patients and professionals.
There is a large body of original papers on digital health interventions aiming to enhance and improve care outcomes. The digital e-health intervention literature conceptualizes the digital tool as the active ingredient that impact outcomes. The typical expected mechanism for effect is that of improved data-capture, improved communication of data or improved presentation/ analysis of data, provides the agents that use digital tools with a better informational basis for action, which in turn will improve outcomes.

Within Health service research there is a broad agreement that high quality care should be person-centred, integrated and pro-active, and that high quality care will deliver the quintuple aim: improved patient experience, health and function, cost-benefit ratios, professional satisfaction and equity. Our research question is what benefits have been documented for patients and professionals, in terms of the quintuple aim, from digitally organized health service interventions?

Material and Methods: We define a digitally organized health care service as a service that supports the patient journey, and involves both the patient and a professional. The patient journey is the collective set of events that are designed to manage the patient's health challenges, including diagnosis, treatment and follow-up of one or more conditions. We searched the Cochrane Library and Web of Science for Digital health, health information systems, telemedicine and their synonyms. We restricted the search to Cochrane Systematic Reviews, which based conclusion on controlled study designs, and were published since 2019.

Results: We found in all 8 reviews that filled the inclusion criteria, of which 3 found an overall effect on at least one of the outcomes of interest. In light of the large volume of studies underpinning some of the reviews, the documented effects were modest. There seems to be a mismatch between the expected benefits of digitally organized health services and their documented effects.
Most reviews studied the digital intervention as a "stand alone" intervention, where the digitally supported health service is compared to usual care. Only one of the reviews framed the digitally organized health service in terms of a health service concept; integrated care [1]. The reviews otherwise did not conceptualize their research questions in terms of quality of care theory. This leaves the contexts and other care-components which might be necessary pre-requisites for the digital tool to impact the outcomes of interest, unexplored.

Discussion: The quintuple aim and the triplet of person-centered, integrated and pro-active care processes are influential guides for health care innovation, especially in the face of the demographic change. WHO acknowledges the central role of digital health to meet goals of universal health coverage, sustainability and maintain quality of care[2]. Quality of care frameworks include digital tools as key to quality of care, yet there are alarmingly few touch points between theory of "health service innovation" and "digital health services". Understanding how these two domains may fertilize each other may move the field forward.

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Posterit / Posters

P-1: Generative AI-aggregated assessment of a child's needs for services

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Introduction: The starting point for the development project was the growing number of child welfare notifications. In 2023, a child welfare report was filed in every tenth child in Finland. In addition, there are challenges related to the availability of social workers, as well as the service needs assessment process is demanding, time-consuming and involves statutory processing times. The aim is to respond to the challenges with the help of a virtual assistant, which would produce a summary document for assessing service needs. [1,3]

Material and Methods: DigiFinland's final report on artificial intelligence identified automatic customer entries as a key utilization target in social welfare and healthcare. Effective automation of entries saves professionals time, making work more efficient, the professional can allocate more time to customer work that improves the customer experience, and the quality of the entries is improved. As potential risks, a professional can start relying on AI entries without checking them, as well as slowing down learning in newly graduated professionals. There is also still little experience in deploying AI solutions. [2]

Results: In the development project, the solution was a virtual assistant, in which generative artificial intelligence was used to compile an assessment of the child's need for services. In the process, a child welfare notification is received for the child. The urgency of the notification is assessed by a social worker, who also decides whether to start an assessment of the need for services. During the service needs assessment, the professional meets the family and family network, makes customer entries and, finally, compiles a summary of the service need assessment based on the gathered information. The purpose of artificial intelligence is to streamline this process and create a summary document of customer entries in accordance with Sosmeta. [3,4]

The105rganizinl solution for assessing a child's service needs compiled with generative artificial intelligence is a language application that takes in the customer story, processes it, and produces a summary of the service need assessment. A summary document is created from customer story data, which is supplemented on Sosmeta's form. When developing the solution, the data used was five different pseudonymised test cases, one good example and one synthetic test case. The solution was improved iteratively as testing progressed. In testing, points were awarded according to whether the answer was right or wrong. Each type of test data was tested with the language models GPT3.5 and GPT4. Synthetic data was also tested with the latest language model GPT4o. The tester was a member of the project team and, in addition, a social worker in one test case. The findings on quality were quite good, for example when looking at one pseudonymised test case using the language model GPT4. According to the project team member, the result of this test case was estimated to be 87% correct and based on the social worker's testing, 78% of the answers were correct. The employee's time savings were 50% per service need assessment summary, which also generates cost savings.

Discussion: There is clearly potential in assessing a child's need for services compiled with generative AI. Next, it would be essential to consider whether it would be possible to scale the concept to other services, as Sosmeta's service needs assessment forms can be found for five different services. Carrying out a cost-benefit analysis for different services is also essential to assess real resource savings. The integration of the artificial intelligence solution into the customer information system, as well as data protection and data security clearances, should also be considered.

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P-2: System-Level Effectiveness Assessment in Wellbeing Services County

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Introduction: The wellbeing services county of Kanta-Häme is conducting a sub-study titled "System-Level Effectiveness Assessment in Wellbeing Services County" as part of the research project "Effectiveness Data Management in the Inland Finland Collaborative Area". The research project is funded by the EU's Sustainable Growth Program. The sub-study is based on Katja Antikainen's (formerly Klemola) dissertation "Evaluating productivity, effectiveness and cost-effectiveness of regionally integrated social and healthcare services – a model based on service utilization and examples". Traditionally, effectiveness has been assessed separately in healthcare and social services, and effectiveness studies have aimed to justify the impacts of interventions, usually focusing on individual diseases or service packages. The novelty value of this sub-study lies in the creation and use of a data model for system-level effectiveness assessment. [1,2].

Material and Methods: The sub-study utilizes registry data brought into the data lake from various information systems of the wellbeing services county. One of the key tasks of the research is to create a person-centered data model, which allows the integration of person-related information from healthcare, social services, and other systems used by the wellbeing services county. The person-centered data model also includes cost information as well as PROM and PREM data, enabling the consideration of both cost and customer perspectives in the effectiveness assessment. One of the research cases studies the use and effectiveness of digital services. The study uses only the registry data of the wellbeing services county. The data is pseudonymized before being stored in the data lake. The act on the secondary use of social and health data (552/2019) allows the use of personal data generated in social and healthcare activities for scientific research.[1].

Results: The goal of this sub-study is to develop and test a systematic effectiveness assessment at the entire wellbeing services county level by combining healthcare and social services data and indicators**.** The sub-study will be conducted during the years 2024-2025. During the initial phase, the preliminary version of the person-centered data model for evaluating effectiveness will be developed. The model compiles the utilized/developed metrics/indicators into a common framework. To utilize quantitative data, information will be 106rganizi into a comparable format (nationally/internationally), for example, using the OMOP model. In the next phase, the model will be tested in the assessment of the use and effectiveness of digital services from different perspectives. The outputs aim to produce a handbook on effectiveness management for the strategic and operational management of the wellbeing services county, scientific publications, as well as seminar presentations and webinars on national forums. [1].

Discussion: The person-centered data model can be applied in various ways: enriching management dashboards with effectiveness information, cost and productivity calculations, monitoring care and service chains, and effectiveness analyses. The model can also offer opportunities for national and international research as well as for customer service guidance and customer-oriented service planning. [1,3].

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Euroopan unionin rahoittama – NextGenerationEU

P-3: The Smart Home concept, Development of digital learning environments

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Introduction: Health and well-being technological solutions are connected to the basic principle of caring about doing good, the goal of which is to promote and maintain a safe, independent and high-quality life. However, the purpose of doing good is not enough, the development and implementation of technologies requires consideration of many things. That is why it is important to constantly develop students and professionals training so that technologies and their introduction and customer guidance become part of normal everyday work in the social and health sector. Well-being technology solutions have been developed for several years now, and initially they were mainly aimed at solutions for independent living at home for the elderly. Today, digitalization and technology already apply to all customer groups in the social and health sector. The Smart Home concept is a simulation learning environment developed by Tredu, where social and health care students practice using health- and well-being technology in the homes of various clients. Tredu's Smart Home is a unique, home-like and cozy simulation learning environment that cannot be found anywhere else in Finland. The concept includes already existing physical smart homes in different locations of Tredu with different devices and solutions The Tredu´s Smart homes are open show rooms for all social- and health care professions and citizens and technical companies as well. A Virtual Smart Home for education in VR glasses is under development and in the future this concept will be built in immersive environment as well. The objective of this concept is to improve social- and health care students' and professionals´ digital skills, meet the needs of working life, cooperate with technology companies and promote the Tampere Smart City development.

Material and Methods: This is implemented as a project, which is supported by the City of Tampere's Change Office. The Tampere City Change Office supports the capabilities of the city's management and personnel to implement digital change and sustainable urban development, the focus of which is human-centeredness and a customer experience that exceeds expectations. As a development work, a digital twin modeled after a Smart home will be built, which will act as a virtual learning environment where students and professionals in the social and health care fields can receive further training. Municipal residents also can familiarize themselves with health- and well-being technology solutions that support living at home. 3D modeling, gamification, artificial intelligence and VR reality are utilized in the construction of the platform.

Results: Expanding and deepening business cooperation, especially with local technology companies. This involves creating a connection to Business Tampere's health hub and AI hub, as well as utilizing quick experiments. Increasing visibility and recognition both inside and outside the city. This involves branding the Smart Home concept, updating homepages, utilizing podcasts, news stories and events. Ensuring competence and resources for building and maintaining a virtual learning environment. This involves acquiring training for software developers and technical draftsmen, as well as appointing a person as the leader of the virtual college. Making vision work about the goals and effectiveness of the Smart Home concept, as well as coordinating it with the strategic goals of Tredu and the city and the metaversum vision.

Discussion: The Smart Home concept enables a new kind of training and expertise in the social- and health care sector that meets the needs of working life and customers. This can improve social- and health care students' and professionals' employment, enjoyment at work, work quality and commitment. The Smart Home concept offers the opportunity to cooperate with various technology companies that can bring new devices and solutions to try and test. This can promote innovation, business and vitality in the Tampere region.
The Smart Home concept utilizes virtual learning environments that can expand the availability and accessibility of education in different locations and countries. This can increase the demand, quality and effectiveness of Finnish education. The Smart Home concept saves resources and reduces environmental impact, technical solutions and equipment can be recycled and shared between different locations. This can support sustainable development and carbon neutrality.

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P-4: DIGIDIA-project- Training digital skills together

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Introduction: In a digitalising society, digital competence is a vital skill. When using various digital health and social services digital competence is emphasised. The DIGIDIA project aimed to respond to the need for develop digital competence. The target groups of the project were individuals at risk of type 2 diabetes, those with pre-diabetes, and recently diagnosed individuals, especially those in a vulnerable labour market position. The project focused on developing digital skills. The digital competence was defined as the ability to use both devices and the internet securely in the use of electronic services to support one's well-being, as well as the ability to seek, understand and critically evaluate information related to maintaining health.

Material and Methods: The project recruited adults aged 18-64 from Tampere who were at risk of type 2 diabetes or had recently received a diagnosis of pre-diabetes or type 2 diabetes (n=60). During the project, efforts were made to develop digital competence especially in the project workshops, during which the participants were together. We went through the following things: the fluent use of devices (computer, smartphone), strong authentication, information security and data protection, reliable information retrieval, critical evaluation of information found, health literacy and available digital health services. In the workshops, the key issues were first discussed through the lectures and then practice through various tasks. After the last workshop, participants responded to the survey.

Results: One question in the final survey was: How would you rate your skills as a user of the internet and online services? The survey was answered by 81 % of the participants. Of them, 2% said they didn't use the internet, 8% felt like a beginner, 20% felt like an independent user, 41% felt like a smooth user, and 29% felt like an expert. Two-thirds thought that the workshops helped to get to know different digital systems and helped to use digital health services. They thought they got useful information and tips on data searching. Participants thought they learned from each other, and it was useful to do things in practise.

Discussion: Learning with peers is a great way to take over digital health services. Participants receive support from each other. They also find that they are not alone with the challenges of using various digital services. When developing citizens' digital skills, group activities are recommended.

P-5: MEDigi, the national development of teaching in medicine and dentistry: A study about the use of the MEDigi contents

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Introduction: MEDigi – Digitalization and harmonization of teaching in medicine and dentistry was a project of the Ministry of Education and Culture (OKM) 2018 – 2021 in collaboration with the faculties of medicine at the University of Helsinki, Eastern Finland, Oulu, Tampere and Turku. The goal was national harmonization and modernization of medical and dental education by utilizing digitalization. After the end of the project, all universities have jointly continued the development work in the MEDigi network as part of the day work of the universities. [1,2]

Material and Methods: A national survey was carried out in November-December 2023. The purpose of the survey was to find out how the functionalities, systems and technologies introduced during the MEDigi project have been integrated into the everyday teaching work in the basic education of medicine and dentistry. Answers to the survey were requested by e-mail from all educators in medicine and dentistry in Finland. The survey was aimed both at the teachers who were involved in the project and at those teachers who were not involved. A total of 80 responses were received.

Results: 1.) 29% of the respondents used national teaching material repository for medical and dental sciences. 60% did not use it, and 11% were not aware of the existence of the repository. 2.) 43% of the respondents have been involved in producing educational material for national use. 3.) 21% of the respondents have used virtual patient cases in teaching. 23% were not aware of their existence.

Discussion: In medical fields, teaching staff uses a lot of digital tools and information systems in the planning, implementation and evaluation of teaching. Their number has grown even more with the COVID-19 pandemic. It's possible that this load has influenced how actively MEDigi systems have been implemented. More active, regular and systematic communication is still needed. Since it is a matter of changing the operating culture and starting and establishing a new type of national cooperation, the change will take place gradually. All universities use all acquired systems, still each university has its own strengths, through which activities have been established. For example, the universities of Turku and Eastern Finland have developed learning games, the universities of Oulu and Helsinki have used virtual patient cases, in Tampere educational material sets produced for common use have been developed and patient cases have been used for a long time in a virtual environment. The results of the survey show that consolidation should continue systematically, also ensuring that teachers are actively informed about various functionalities. There is a need to especially target teachers who have not been involved during the project.

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P-6: Innovation Factory- Päijät-Häme Health, Sport & Wellbeing

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Introduction: The Innovation Factory in Päijät-Häme is a comprehensive initiative aiming at boosting innovation in health, sports, and well-being sectors. By fostering collaboration between universities, companies, and public sector organizations, it aims to create a dynamic environment for developing ideas for new products and services. The focus is on digital services and well-being technology, especially in preventive health and rehabilitation.
The project emphasizes the importance of a multidisciplinary approach, involving various stakeholders to ensure high-quality outcomes. The integration with the Sports Business Hub Finland and the LAB WellTech's Testbed services further strengthens its potential impact. The aim of the model is to enhance business operations, improve cost-efficiency, and provide better services to customers in the region.

Material and Methods: The idea is to build multidisciplinary learning environment, where students teams are solving existing challenges of companies and public sector. The companies come among health, sport and wellbeing and the ideas are concerning of usage of new technologies in services. Students are using service design methods in development work to ensure the client perspective. Key Features are 1. Collaboration and Participation: High-quality involvement of the LAB University of Applied Sciences. Integration of business services, assignments from the business world, partners, and the university. 2. Innovation Development: Accelerates the development of new products and services in health, well-being, and sports. Enhances customer service experience and strengthens business operations and cost-efficiency. 3. Multidisciplinary Expertise: Creation of a multidisciplinary Innovation Factory based on business needs. Experimentation, demonstration, and learning environment for joint innovation development.

Results: The project aims to create an operating model for developing innovations to address the challenges faced by companies and organizations in the health, sports, and well-being sectors in the Päijät-Häme region. It focuses on promoting the use of digital services and well-being technology, particularly in preventive health promotion, exercise, and rehabilitation services. The project aims to enhance the innovation capacity of future professionals, promote business-oriented innovation activities, and increase the region's attractiveness and retention power.

Discussion: Promoting of co-creation of companies and higher education will produce new ideas and innovations as well as promote innovation competences helping to solve complex problems in future.

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P-7: NOTRE project stakeholders support the product development of start-ups

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Introduction: The NOTRE (Novel Methods Improving Production Innovation Potential with examples of senior care-related solutions) project [1] aims to promote the development and marketing of new services and technological solutions for the ageing population. It also supports policy making and planning for ageing well by contributing to the development of the next regional programme. The project will also make use of partners' learning platforms to support business product development and knowledge transfer between partner countries. At regional level, a stakeholder group invited to the project will support project activities and regional cooperation. The Notre project is funded by Interreg Europe is an interregional cooperation program co-funded by the European Union. This study highlights the early phase results.

Material and Methods: The NOTRE project is a 3+1-year project that started on 1 March 2024 and involves 9 partners from 7 countries across the EU. The partners are associations, public actors, universities and regional actors. Partners have different learning environments related to the digitalisation of social and health care. In addition, stakeholders in each region support the project's objectives and the companies' product development. The stakeholders are drawn from a wide range of key actors in the regions. Stakeholder groups include additional political representatives, to extend the project's impact and objectives to the regions' strategies. Thus, an innovative approach is obtained from policy makers and stakeholders to support small businesses in meeting the challenges.

Results: The results of the NOTRE project will strengthen policy measures to promote innovation in the field of ageing well and enhance the use and integration of testbeds in development work. The political community is represented by the project's stakeholder group, which meets twice a year. Each participating country has its own stakeholder group, whose members have opportunity to meet at project meetings. The stakeholder groups review the progress and activities of the project and exchanges information on activities and cooperation in the area. The Stakeholder Group also includes political actors to provide background information for decision making.
Small and medium-sized enterprises contribute know-how and potential to develop new services and equipment for older people. The challenge may be potential failure, regulatory or ethical issues or market access challenges.
Key themes include the introduction of testing and learning environments, integration of target groups, and addressing legal, ethical and cultural barriers and strategic support.
Learning environments play an important role in the NOTRE project. Learning environments are designed to support companies' product development and contribute to the transfer of knowledge between partner countries. The project will also consider the best and most effective model for using learning environments and their networks to help companies develop new services, products and internationalisation.

Discussion: Interreg Europe projects funded by the program aim to reduce disparities in levels of development, growth and quality of life between European regions. In the Notre project, stakeholders play a key role in the delivery of project results. Supporting business innovation, creating, and enabling networks and participating in regional strategy preparation brings an interesting mix of stakeholder engagement and project outcomes. [2]

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P-8: The Use of Assistive Technology on Comprehensive Support for People with Dementia, Caregivers and Healthcare Professionals: A Scoping Review

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Introduction: The global rise in the number of older adults with Alzheimer's disease presents significant challenges for healthcare systems worldwide, highlighting the urgent need for innovative approaches to dementia management. Assistive technology (AT) offers a promising solution for addressing the complex needs of Alzheimer's patients, their caregivers, and healthcare professionals. This scoping review aims to explore the use of assistive technology among Alzheimer's disease patients, caregivers, and healthcare professionals, with a particular focus on its role in providing comprehensive support within the care system.

Material and Methods: Following the PRISMA-ScR guidelines, a comprehensive search was conducted across three major databases: PubMed, Scopus, and Web of Science, supplemented by gray literature sources. The inclusion criteria covered peer-reviewed publications from the past decade, encompassing both quantitative and qualitative studies that explore the use of assistive technology for Alzheimer's disease patients, caregivers, and healthcare professionals.

Results: The review included a total of 25 articles, featuring a mix of quantitative and qualitative studies from diverse geographic locations. The analysis of the literature identified three key themes to address the research questions: A) Types and Applications of Assistive Technology, B) Effectiveness, User Experiences, and Barriers, and C) Systemic Support Within the Care System. These themes provided a comprehensive overview of various types of assistive technology, their applications, effectiveness, user experiences, and barriers, underscoring the multifaceted role of assistive technology in dementia care.

Discussion: The findings highlight the potential of assistive technology as a valuable tool for supporting Alzheimer's patients, caregivers, and healthcare professionals in managing the complexities of dementia care. However, further research is needed to fully understand the benefits and challenges of assistive technology in enhancing systemic support and interaction dynamics within the care continuum. This study aims to inform future research and interventions focused on optimizing the use of assistive technology to improve the well-being of individuals affected by Alzheimer's disease.

Key words: Assistive Technology; Alzheimer Disease; Systemic Support; scoping review

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P-9: Research center promotes research on health and human services informatics and digitalization

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Introduction: Today's research is tomorrow's treatment. As the social and health care system undergoes reforms, technological advancements are simultaneously transforming the ways in which social and health services are delivered. Digitalization and information systems are seen as a solution managing the growth in service demand. Thus, research evidence is needed to underpin policy and administrative decisions.
One of the strategic goals of the Wellbeing Services County of North Savo is to create research conditions for social and health management and health informatics to strengthen research practice and use research evidence in decision-making [1]. The aim is for scientific research to be the norm in all activities in the wellbeing county. Research in health informatics and digitalization in social and health care provides information to support development and provides the foundation for evidence-based digital services and information management practices.

Materials and methods: To strengthen research activities in the field, the Research Center for Nursing Science and Health and Social Management has been established. The research center aims to improve quality of services through research. One of the center's research areas is digital services and health informatics especially information systems and managing information. Other research areas include quality, effectiveness, and patient and client safety, preventative nursing, as well as social and health management and economics. The research center employs a full-time research manager and, in collaboration with the University of Eastern Finland, an associate professor of nursing science, a professor of nursing science, an associate professor of social and health management, and a professor of health and human services informatics.
The Research Center aims to foster impactful and sustainable research and innovation activities, with a focus on increasing research funding and publication output. Additionally, the center strives to create career pathways in research professionals in social and health care. The purpose of the Research Center's activities is to strengthen evidence-based practices across the entire wellbeing services county.

Results: During the Research Center's first full year of operation (2024), two research projects related to health informatics and digitalization in social and health care.

1. **Safety of Digital Services and Technology Use:** This project aims to identify and describe types of adverse events associated with the use of digital services and technology in care and remote care practices. The research utilizes adverse event reports as its data source. The project is led by Research Manager Virpi Jylhä and is funded by Government Research Funding (VTR).
2. **Experiences of Rehabilitation Professionals with Client and Patient Information Systems and Digital Services:** This project aims to investigate the impact of digitalization on the workload, productivity, and well-being of rehabilitation professionals. The research is conducted in collaboration with Savonia University of Applied Sciences and the National Institute for Health and Welfare (THL). The data will be collected through a national survey, based on surveys conducted for other professional groups in the Social and Health Care Information System Services Monitoring and Evaluation (StePS) project. The project is led by Research Manager Virpi Jylhä and is funded by the Finnish Work Environment Fund.

Discussion: The Research Center for Nursing Science and Social and Health Management enhances multidisciplinary research in health informatics and digitalization within social and health care and promotes the utilization of research evidence in the field. We are keen to collaborate with various health and social care organizations, academic institutions, and other partners.

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P-10: The stakeholder needs for national digital health network in Finland

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Introduction: The Digital Health Knowledge Network aims to create a national network development agenda, paving the way for a new type of thematic cooperation and coordination in Finland for digital health development operations and actions. The aim of the study is to describe key stakeholders' needs for a national network cooperation and coordination to define the vision, the mission, and the tasks of the national digital health network. The project is one the Innocities' lead theme projects, and co-funded by the European Union through Counsil of Tampere region [1].

Materials and Methods: The evaluation of the stakeholder needs is based on a document analysis, semi structured interviews and surveys. The previous literature used included e.g. national reports related to digital health networks [2], growth strategy for research and innovation activities in the health sector [3], and health sector vision for growth and competitiveness in Finland [4]. Also, websites of wellbeing counties, Finnish universities, and funding institutions were analysed. Interviews and surveys were conducted among healthcare service providers, research and education institutions, and companies, ecosystem operators, innovation support service providers. Altogether 38 in-person and online interviews were conducted in Finland during spring 2024, covering representatives from different regions and stakeholder groups. The materials were analysed by qualitative content analysis method and identifying common themes. Additional surveys (n=18) were performed to gain information about commercialization challenges among testbed users and general service need among enterprises.

Results: According to the document analysis there are numerous actions to promote digital health research, development and innovation, but coordination and communication on the national level is missing. Also, more effort, resources, national coordination, and international collaboration are needed to promote the export of Finnish digital health expertise and solutions. The summary findings of the interviews and surveys describe the needs of the more specific stakeholder groups. Companies' needs were related to focus on healthcare industry and regulatory expertise, building development partnerships, and access to international markets and customers. Healthcare service providers' needs were related to finding suitable, effective and efficient digital solutions and services, networking with peer organizations and experts struggling with similar day-to-day and strategic issues and strengthening project and research operations. Researchers, on the other hand, need support on networking and finding new partnerships, as well as building new, bigger consortia and projects.

Discussion: The need for national coordination of the numerous actions to develop the digital health research, development and innovation operations and environment is obvious. The common themes in stakeholder groups' needs relate to finding the right expertise, new partnerships, and relevant information. A national digital health network operation can provide facilitation to meet those needs. The next steps in building the network include defining and prioritizing the key tasks of the network, based on and meeting the needs of the stakeholders in the field of digital health. The stakeholder needs inform also the planning of the budget and resources, defining key roles and actors and creating the roadmap for the network's initial phases, which will be conducted in the Digital Health Knowledge Network project by the end or 2024.

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P-11: Fasibility of a noninvasive heart failure telemonitoring system: A mixed methods study

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Introduction: Heart failure is a global health problem with an increasing prevalence and burden to patients and healthcare systems. [1] Noninvasive telemonitoring might reduce mortality and heart failure hospitalizations. [2] Feasibility is an important factor regarding patients' adherence to and the success of implementing telemonitoring programs. [3,4] Only a few studies have assessed the feasibility of noninvasive heart failure telemonitoring systems earlier.

Material and Methods: This cross-sectional observational study examined the feasibility of a noninvasive telemonitoring system used by heart failure patients and nurses in two Heart Hospital units and one health center in Finland. We used a mixed methods design. Quantitative data were collected with one self-generated questionnaire for patients, and qualitative data were collected with a questionnaire for patients and semi-structured focus group interviews for patients and nurses. The questionnaire was sent to 47 patients who were in the pilot program of telemonitoring, and 29 patients (61.7%) responded. Purposefully selected 8 patients and 8 nurses attended the interviews. We used descriptive statistics to assess the quantitative data from the questionnaire and inductive thematic analysis to identify themes deriving from the focus group interviews. We categorized the themes into facilitators and barriers to telemonitoring.

Results: Both the quantitative and qualitative data show that the telemonitoring system is easy to use, supports self-care and self-monitoring, and increases the feeling of safety. The chat tool of the system facilitated communication between patients and nurses. The participants considered the system reliable despite some technical problems. The focus group interviews addressed technical challenges, nurses' increased workload, and patients' engagement with daily follow-up as possible barriers to telemonitoring.

Discussion: The noninvasive heart failure telemonitoring system used in the pilot program is feasible. We found facilitators and barriers to telemonitoring that should be considered when developing the noninvasive telemonitoring of heart failure in the future.

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P-12: Defining functional requirements for a self-management solution for Hypertrophic Cardiomyopathy (HCM) patients – a multi-stakeholder multi-framework approach

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Introduction: Hypertrophic cardiomyopathy (HCM) is the most common inherited heart disease (prevalence 1:200 – 1:500), manifested by thickening of cardiac walls, increasing risks of arrhythmia, and sudden cardiac death. HCM affects all ages and is the leading cause of death among young athletes. The disease has highly diverse phenotypes and progression patterns, making it challenging to provide the truly personalized care. The EU funded project SMASH-HCM (GAP 101137115, https://smash-hcm.eu/) develops a digital-twin based decision support solution to dramatically improve disease management, for clinicians and for patients. For patients, a digital tool will be developed providing them with personalised guidance on topics such as understanding the disease and potential impacts of lifestyle choices, and to collect personally relevant health, information. The aim is to empower them to live life with HCM in the best way possible. User requirements are collected and updated together different stakeholders. They will help software developers understand how each requirement's implementation may affect a patient's behaviour and commitment to using the software.

Material and Methods: User personas were created based on existing knowledge in the form of documented patients' experiences [1]. The personas were generated with the help of artificial intelligence tools [2] by providing them with points highlighted in literature. Then, clinicians' views from three clinical centres (Italy, Finland, and France) were collected in a workshop. Their views on patient care helped crystalize the user personas' needs and goals. Clinicians' insights were further used as a framework for creating user stories. After this, the Behavior Change Wheel (BCW) [3] and the Octalysis framework [4] were used. Stories were grouped and analysed to find requirements, BCW was used to identify users' capabilities, opportunities and motivation in terms of grouped user stories. Requirements were formed from the stories. Subsequently, Octalysis motivation factors were combined with the requirements and gamification elements were considered. Gamification techniques, such as point systems and achievements increase user interest and engagement, which is essential to motivate and engage users. This methodology is complemented by interaction with cardiomyopathy patient organisation representatives from different countries. They discussed the challenges faced by patients in managing their disease and in following their plan of care in between clinic visits. The interviewees proposed areas of information content and interactivity that would be most useful.

Results: Six initial user personas were generated using generative AI. After reflecting them with clinicians' insights, a set of personas emerged that addresses both needs of patients and views of healthcare professionals. Personas include, e.g., a 68-year-old retired accountant with HCM, a 22-year-old university student and competitive athlete with newly diagnosed HCM, and a 45-year-old IT consultant – all with different needs and backgrounds. Building further on these, in interaction with healthcare professionals and patients, 19 user requirements were defined, covering categories such as 'monitoring and alerts', 'social networking and support groups', ''personalized advice'. They are the basis for the initial version of the software development.

Discussion: The work used a unique combination of established tools and frameworks for design specifications, such as BCW and Octalysis with novel approaches such as generative AI. This was coupled with interaction and validation from patient representatives and healthcare professionals, thus providing a solid set of requirements. The software developers utilise this material to design digital tools, through iterative cycles of consultation with end user representatives, and taking into account implementation-related realities.

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P-13: Skull fracture detection for point-of-care diagnostics and monitoring using microwave technique

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Introduction: Prompt and accurate diagnosis of skull fractures is crucial for preventing complications and improving treatment outcomes. Early assessment of fracture severity, treatment options, and hospitalization needs is essential [1]. High-resolution CT scans and MRI have enhanced fracture detection and assessment but are limited by radiation exposure and accessibility [2]. There is growing interest in safer, portable techniques for skull fracture detection. Point-of-care ultrasound (POCUS) is a promising alternative, especially for children, but its accuracy depends on the operator's skill [2]. Microwave technology has shown potential for detecting linear skull fractures and monitoring healing [3], though its efficacy with depressed fractures remains unexplored. This paper aims to evaluate microwave technology for detecting depressed fractures and discuss portable skull fracture detectors.

Material and Methods: Microwave technology operates by detecting differences in the dielectric properties of tissues. In this study, simulating an acute fracture scenario, skull fractures are modeled using blood, which has distinct dielectric properties compared to skull bone. These differences are expected to be detectable through both the antenna reflection coefficient (S11 parameter) and the channel parameter (S21). Evaluations are conducted using electromagnetic simulations with a human tissue layer model, as depicted in Fig. 1a, featuring a depressed fracture model with a diameter of 2 cm as well as in the reference case without the fracture. Additionally, a 5 cm depressed fracture is also studied. Small, flexible antennas, also illustrated in Fig. 1a, operating within the frequency range of 2.5-10 GHz, are utilized in these evaluations. This wide frequency band allows for the determination of the optimal frequency range for fracture detection.

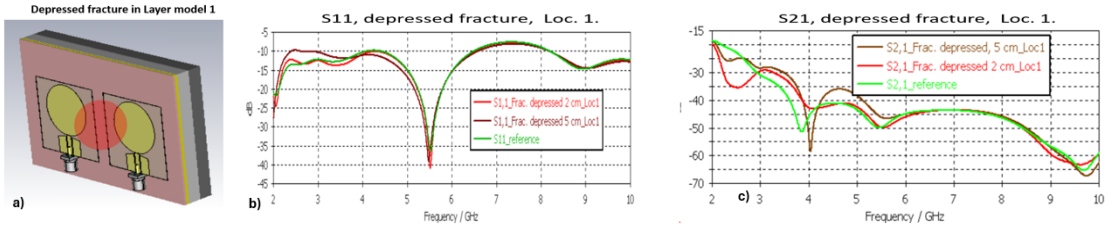

Figure1: a) Layer model with depressed skull fracture, b) S11 results and b) S21 results obtained using a head tissue layer model and the depressed skull fracture and in reference case.

Results: The S11 and S21 results channel parameters in the presence and absence depressed skull fractures having widths 2 cm and 5 cm are presented in Figs. 1b-c. As it can be seen, fractures cause clear changes both in S11 and S21 results. The difference to the reference case is naturally larger with 5cm fracture: up to 10dB. The most optimal frequency ranges for detecting depressed fractures are 2.5 GHz, 3-5.5 GHz and 9-10 GHz. The results are in line with the evaluations carried out with linear fractures [3].

Discussion: The numerical evaluations presented in this paper demonstrate that microwave technology has significant potential for detecting depressed skull fractures. The results are promising, indicating that microwave technology could be developed into an easy-to-use, portable, and fast-operating device. Such a device could be utilized in smaller healthcare centers or ambulances, and potentially even as a non-contact tool which would facilitate diagnostics with children and in general, seriously injured individuals.

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P-14: The benefits of the Digital Health Village´s hubs and the HealthVillagePRO service were assessed as significant

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Introduction: Health Village´s hubs and the HealthVillagePRO service are part of the Digital Healthvillage.fi service package. The hubs provide extensive information and support to those who look after their own, or a loved one's well-being. They can also be used in the discussion, guidance, and sharing of information between professionals and clients or patients. HealthVillagePRO complements the skills of health and social services professionals and encourages them to use new practices in their work. The service strengthens professionals' e-knowledge by offering training and online courses for changing operations related to digital transformation. The service also contains various sources of information, such as guides for clinical work and virtual cente's. Health Village´s hubs and the HealthVillagePRO service are free of charge for their users and have an established user base. The aim was to assess the economic impact of Health Village`s hubs and the HealthVillagePRO service and to further develop a cost-benefit model for evaluation.

Material and Methods: The value drivers to be 118rganizi included the impact on the working time of social and healthcare professionals and the impact on the citizens' health. The assessment used previously available literature, and in-depth interviews were conducted with professionals who use the hubs. Additionally, surveys were conducted for citizens and social and healthcare professionals.

The assessment used a so-called counterfactual analysis by examining the impact on healthcare in a situation where the Health Village´s hubs would not exist, unlike they do now. The evaluation project was carried out in collaboration with experts from HUS and ESIOR in the fall of 2023.

Results: The use of Healthvillage`s hubs and the HealthVillagePRO service has significant effects on professionals' working time, citizens' use of health services, absenteeism from work, and achieved health benefits. According to the assessment, the societal value of the services increases as the number of users grows. The economic value of the services was examined in the Helsinki city area, Uusimaa, and the cooperation area of Southern Finland.

Discussion: In the examined areas, the use of Health Village´s hubs and the HealthVillagePRO service is probably above the average national use, because in these areas their adoption rate is higher than average.
About 60% of the estimated total value consists of indirect benefits, avoided production losses, and achieved health benefits. However, the direct effects of the hubs and the HealthVillagePRO service on professionals' working time and citizens' use of health services are also considerable.
Although the use of the services is already firmly established, their maximum usage potential has not yet been reached. Also, social services not considered in the assessment could significantly increase the estimated total value of benefits.
The benefits scale with usage, i.e. the more the use of Health Village´s hubs and the HealthVillagePRO service increases, based on these results, the greater the cost benefits are expected to be.

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P-15: When Empathy Challenges Technology: A New Dimension in the Evaluation Framework

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Introduction: We live in a modern digital era where the balance between technology and human factors has become increasingly significant. This study explored the central role of empathy in the development of wellness technology. The aim of the research was to determine how digital solutions can optimize their effectiveness while simultaneously supporting and enhancing human relationships. The focus was particularly on how technological innovations can improve interaction and connections in social and healthcare environments.

Material and Methods: This study employed an integrative literature review to develop a comprehensive understanding of perspectives related to empathy, wellness technology, and technology in general. The review extensively evaluated digital tools, such as virtual reality (VR) and artificial intelligence (AI) systems, in terms of their ability to foster empathy. In collaboration with LAB WellTech, an empathy dimension section was developed and integrated into their existing technology assessment framework, enabling a systematic and structured evaluation of the empathetic features of technological solutions. This section provides practical recommendations for the design and development of wellness technology, addressing the broader societal need to align technological innovations with human needs, thereby supporting the preservation of empathy in the digital world.

Results: The study revealed that the specific needs of individuals and communities often stem from the demands and challenges associated with well-being, health, and demographic factors [1], whereby empathy plays a significant role in ensuring that solutions are accessible and equitable for everyone. The research particularly highlighted the importance of addressing the needs of elderly and mentally vulnerable groups, which requires careful and sensitive application of technology to their unique characteristics [1]. Additionally, the study found that technologies such as virtual reality (VR), remote communications, artificial Intelligence (AI), and social robots can significantly enhance emotional expression and interaction by providing new and effective tools [2]. However, the research also highlighted the challenges of effectively measuring empathy and emotional states, as traditional methods are often subjective and limited, while more objective technological solutions continue to struggle with technical issues and recognition difficulties, which undermines the accuracy and reliability of measurement results [3].

Discussion: The research emphasizes that prioritizing users' needs and experiences are crucial in the development of well-being technologies [4], reflecting a broader trend where the human perspective is central to technological advancement. The design and evaluation of technologies must emphasize human diversity, personal experience, usability, and accessibility, while also promoting equity and well-being. Therefore, empathy is a key factor in this process and should be valued on par with traditional evaluation criteria. In Finland, legislation alone mandates ensuring the accessibility of technology, which makes empathy an even more critical basis for assessment. However, measuring remains complex. The evaluation framework developed by LAB WellTech, where the dimension of empathy is a core element, provides a practical tool, but it also highlights the need to develop more precise metrics and methods for assessing empathy. Technology development is not just about technical performance or economic benefits but about how technology impacts people's lives. Without empathy, technology can lead to discrimination, ethical issues, or deterioration in users' well-being. It is essential to ensure that technologies adapt to people's needs rather than forcing people to adapt to technology. This approach not only benefits users but also aligns technological advancement with the core principles of compassion and understanding in the social and healthcare sectors.

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P-16: Using text-based asynchronous digital technology to support young people's mental health

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Introduction: The mental health of young people is a global concern. In Finland, the needs of young people seeking mental health help are not adequately met. [1,2]. Digital technologies have been developed to promote the mental health, to prevent and treat mental health problems, but their effectiveness is uncertain. Web-based interventions can reduce symptoms of depression and anxiety, but their complexity makes it unclear why they're effective. [3,4,5]. In addition, there is limited information on how young people use technology intended to support mental health. Therefore, it is important to study different digital technologies and intervention components and how young people use them to support their mental health [6]. The aim of this study was to describe how and for what purposes young people use text-based digital asynchronous technology, which allow communication without both parties needing to be online simultaneously.

Material and Methods: The use of text-based asynchronous digital technology was studied with the help of an electronic diary (e-diary) in adolescent psychiatry outpatient clinics and with the help of an online service aimed for all Finnish young people under the age of 21. The data from e-diaries were collected during 2008–2010 using the Depis.Net program. An e-diary use was part of a six-week web-based program with a total of five weekly themes [7]. The data from an online service were collected between 1 January and 31 December 2018. The data was gathered from the regular web messaging data of the Mannerheim League for Child Welfare's (MLL) 'Child and Youth Helpline'. Web messaging allowed for multiple two-way communications between a young person and a counsellor. Quantitative data were analysed with descriptive analysis and qualitative data with inductive thematic analysis.

Results: Most of text-based asynchronous digital technology users were females, it was used mainly in evenings, and long-term use was low. Those who used an e-diary had current or previous experiences of depression and mental health care services. The number of words used varied a lot; in e-diaries ranged from 8 to 1,442 per each log and in web-messaging from 2 to 4,097 per each message. Young people used text-based asynchronous digital technology to reflect and openly discuss their mental health and personal issues, such as their relationships, identity, social life, health and illness, and how they saw and experienceed themselves. [8,9]

Discussion: Text-based asynchronous digital technology has the potential to help young people monitor their behaviour and symptoms, and reflect on their experiences and thoughts, no matter the time or place. This technology can improve the availability and adequacy of mental health services for young people. When designing and implementing text-based asynchronous digital technology, it is important to consider the gender-specific needs of young people and their willingness to use it as mental health support.

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Finnish Journal of eHealth and eWelfare

http://www.finjehew.fi

FinJeHeW on Suomen Telelääketieteen ja eHealth-seuran ja Sosiaali- ja terveydenhuollon tietojenkäsittely- yhdistyksen yhteisesti perustama tieteellinen lehti, joka palvelee myös jäsenlehtenä.

Lehden tarkoituksena on edistää tieteellisten perustajaseurojensa Suomen Telelääketieteen ja eHealth-seuran (SteHS) eli Finnish Society of Telemedicine and eHealth (FSTeH) (www.telemedicine.fi) ja Sosiaali- ja terveydenhuollon tietojenkäsittely-yhdistyksen (STTY) eli Finnish Social and Health Informatics Association (FinnSHIA), (www.stty.org) edustamien tieteenalojen tieteellistä julkaisutoimintaa, kokouksia ja seminaareja. Se toimii myös seurojensa jäsenten ja muiden asiasta kiinnostuneiden tiedotuskanavana ja yhdyssiteenä sekä valistustyön ja koulutuksen tuottajana ja välittäjänä. FinJeHeW:lle on vuodesta 2010 myönnetty vuosittainen Tieteellisten seurojen valtuuskunnan julkaisutuki.

Lehti ottaa vastaan tieteellisiä artikkeleita sekä muuta aineistoa sosiaali- ja terveydenhuollon informaatioteknologiasta, telelääketieteestä ja eHealth-alalta. Kirjoitusohjeet ovat lehden sivustolla. Lehti on pääasiassa suomenkielinen, mutta siinä on artikkeleita, niiden tiivistelmiä ja muuta aineistoa englanniksi. Lehti noudattaa käsikirjoitusten arvioinnissa kahden refereen menettelyä. Lehden sisältö julkaistaan avoimesti syksystä 2017 lähtien. Lehti ilmestyy neljä kertaa vuodessa.

Lehden ISSN-tunnus on 1798–0798.

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Finnish Journal of eHealth and eWelfare

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Finnish Journal of eHealth and eWelfare (FinJeHeW) is a scientific journal established by the Finnish Society of Telemedicine and eHealth (FSTeH) and the Finnish Social and Health Informatics Association (FinnSHIA), and it also serves as the official journal for the members of the establishers.

The Journal was established in 2009. The aim of the Journal is to promote scientific research, communication and education in the fields of information and communication technology relating to social and health care, telemedicine, eHealth and eWelbeing.

Financial assistance has been granted to the journal by the Federation of Finnish Learned Societies since 2010. FinJeHeW benefits the members of the associations further by functioning as an information channel, multidisciplinary publication forum, and supporter for the international network.

The Journal welcomes articles on information and communication technology of social and health care, telemedicine, eHealth, and eWelbeing. Instructions for authors can be found on the Journal website. FinJeHeW is mainly a Finnish language journal, but also includes articles, abstracts and other material in English. All submitted manuscripts are evaluated by the editor. Manuscripts that are considered suitable for publication in the Journal are sent to two referees for assessment. The contents of this journal will be available in an open access format starting from autumn 2017. The Journal is published in electronic form and includes four issues per year.

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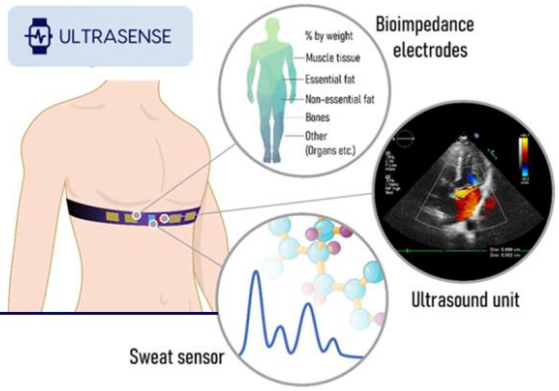
The UltraSense Project

Ultra-Sound Combined with Bioelectrical Impedance Analysis and Graphene Field Effect Transistor Enhanced Wearable Sensing for Decentralised Health-Monitoring

Funded by the European Union

European Consortium to Revolutionise Health Monitoring with Advanced Wearable Technology

The UltraSense project is a collaborative effort to develop a state-of-the-art wearable device that combines three different sensing technologies. By providing accurate and personalised health data, UltraSense aims to support managing and reducing obesity and related comorbidities, including MetSyn. This innovative approach will democratise body composition and health assessment, making it accessible to all. Project duration: 1 September 2024 – 31 August 2028.
The project website: www.ultrasense.eu.



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