



Norwegian Centre for
E-health Research

Annual Report 2021





Norwegian Centre for
E-health Research

This is a publication from the Norwegian Centre for E-health Research.
Editor: Randi Laukli, Norwegian Centre for E-health Research

Norwegian Centre for E-health Research
Postbox 35
N-9038 Tromsø
NORWAY

E-mail: mail@ehealthresearch.no
Website: ehealthresearch.no
Facebook: [@ehelseforskning](https://www.facebook.com/ehelseforskning)
Twitter: [@ehealthNORWAY](https://twitter.com/ehealthNORWAY)
YouTube: [/norwegiancentreforehealthresearch](https://www.youtube.com/norwegiancentreforehealthresearch)
LinkedIn: [/company/ehealthresearch](https://www.linkedin.com/company/ehealthresearch)
Instagram: [@ehealthnorway](https://www.instagram.com/ehealthnorway)

Text:
Oddny Johnsen, Krysspress
Lene Lundberg, Norwegian Centre for E-health Research
Randi Laukli, Norwegian Centre for E-health Research
Hasse Berntsen, Norwegian Centre for E-health Research
Nora MacLaren, Norwegian Centre for E-health Research
Amanda Isaksen, Norwegian Centre for E-health Research

Images:
Rune Stoltz-Bertinussen, Krysspress
Jarl-Stian Olsen, Norwegian Centre for E-health Research
Lene Lundberg, Norwegian Centre for E-health Research
Hasse Berntsen, Norwegian Centre for E-health Research
Randi Laukli, Norwegian Centre for E-health Research
Eirin Rødseth, Norwegian Centre for E-health Research
www.colourbox.com

Layout and graphic design:
Jarl-Stian Olsen, Norwegian Centre for E-health Research

Printed by:
Norbye & Konsepta AS

Contents

Statement from the head of the steering committee.....	5
The steering committee.....	6
The organisation.....	8
Digital or physical? The solution is hybrid	10
We twitter morning, noon and night	11
Media articles.....	12
Finances	14
Knowledge for improved healthcare services.....	15
Vision and values.....	16
Research figures.....	17
Research cooperation	18
Adding knowledge through webinars.....	20
International cooperation brings new perspectives	22
Cooperation with the World Health Organization	24
Snapshots from the e-health year.....	26
Appendices	48
- Journal publications.....	48
- Reports	53
- Book section.....	54
- Conference contributions	55
- Media contributions.....	59



Statement from the Head of the steering committee

The Norwegian Centre for E-health Research is an important knowledge provider and is widely acknowledged for its research. A key area of the Norwegian Centre for E-health Research's social mission is to gather, create and disseminate knowledge that contributes to knowledge-based development within e-health. The knowledge that the centre produces shall help support national efforts.

When first established, it was assumed that the centre would be evaluated by the Ministry of Health and Care Services. Evaluation was to be conducted in two phases; the first was conducted in 2018, the second in 2021. The 2021 evaluation was two-fold: a general evaluation of e-health research in Norway and a separate evaluation for the Norwegian Centre for E-health Research.

The Ministry of Health and Care Services has asked the steering group general questions about strategic choices, potential for improvement in the management structure and discussed issues concerning the need for knowledge and how knowledge is developed within the e-health area. The steering group is of the opinion that the management structure works well, with a good understanding of roles between the ministry via North Norway Regional Health Authority, the University Hospital of North Norway and the centre management, in addition to the professional management exercised by the steering group.

Knowledge is built up in many ways, and research is but one way. Research as a method is thorough and time-consuming and other methods will be more suitable in certain contexts. This has to be assessed in each individual case. Knowledge is built up both through research and sharing, through, for example, popular science channels, webinars or presentations.



It is important to have good research environments and to manage funding so that the knowledge needs are met. The Ministry must ensure that good environments that have been gradually developed are preserved and utilised in the best possible way. Financing must be directed to areas where there is a need for knowledge. Basic funding is essential in order for the Norwegian Centre for E-health Research to be able to maintain and develop its national role.

It is a source of pleasure to see the Norwegian Centre for E-health Research succeed in having larger research projects approved. In 2021, the centre was granted the application 'Dignity Care' by the Research Council of Norway. The project will help to improve health services for chronically ill patients with long-term complex needs, a goal that is reflected in the current national health and collaboration plan. It is an important and challenging project.

The results from 2021 show sound development, indicating that the Director, Management Group and all co-workers are collectively managing to solve the tasks and challenges that arise from the important social mission assigned to the Norwegian Centre for E-health Research.

*Erik M. Hansen,
Head of the steering committee*

The steering committee

The purpose of the steering committee is to ensure that:

- the centre further develops its expertise and carries out research assignments and investigations on e-health in line with the sector's needs and priorities; to the extent that such competence does not exist at the current centre, this must be acquired and built up, possibly through partnership with other relevant competence environments. This especially applies in fields where the health authorities request expertise and services from the centre through annual assignment documents and letters of award;
- the centre further develops its national (and international) role within research and investigations on e-health, and is considered useful, relevant and competent within the sector;
- the centre maintains high quality in relation to its professional activities, support functions and administrative tasks.

Steering committee members:

- Erik M. Hansen, Director e-health, Western Norway RHA (head of the steering committee)
- Nis Johannsen, Head of Digital Innovation, South-Eastern Norway RHA

- Siv Mørkved, Professor and Assistant Director of Health Sciences, Central Norway RHA
- Kjetil E. Telle, Director of Health Services Research, Norwegian Institute of Public Health
- Roar Jakobsen, Senior Advisor, the Directorate of E-health
- Vitalii Ikoiev, Senior Adviser, the Norwegian Directorate of Health
- Tove Klæboe Nilsen, Acting Quality and Research Director, Northern Norway RHA
- Terje Wistner, Dept. Director, Norwegian Association of Local and Regional Authorities (KS)
- Helge Garåsen, Director of Health and Welfare, Municipality of Trondheim
- Margunn Aanestad, Director Centre of E-health, University of Agder
- Markus Rumpsfeld, Director E-health, Collaboration and Innovation, University Hospital of North Norway
- Jostein Jensen, Divisional Director Security, Norwegian Healthnet
- Egil Rye-Hytten, The Norwegian Federation of Organisations of Disabled People – user representative
- Kristian Skauli, Dept. Director, Ministry of Health and Care Services – observer

Fredrik Bakke, Economics and Personnel Advisor, Administration

What was the best thing about 2021?

My year with the Norwegian Centre for E-health Research began in June 2021. Before that, I worked in the Personnel Dept. at the University Hospital of North Norway.

The autumn was important for changing my way of working and way of thinking: from providing support from the outside to getting to know the centre from the inside.

As someone new, it was great to come to a workplace where I felt welcome, valued and included by all my co-workers from the very first day.



*Digital steering
committee meeting*



The organisation

Number of employees:

- 100 with 74.3 FTEs
- 54 women and 46 men
- 67 permanent employees
- 33 part-time employees
- 11 additional positions
- 14 new co-workers in 2021, seven in permanent positions and seven in temporary/limited term positions.

Age:

- Two under the age of 20
- 35 in the 20-39 age group
- 56 in the 40-59 age group
- Seven above the age of 59

Educational background:

- Bioengineering
- Biology
- Pharmacy
- Physics
- Physiotherapy
- Graphic design
- Health science
- ICT
- Journalism
- Communication
- Medicine
- Organisation and management
- Pedagogy
- Psychology
- Accounting and audits
- Social Science
- Socioeconomics
- Civil engineering
- Business administration
- Sociology
- Statistics
- Nursing
- Technology

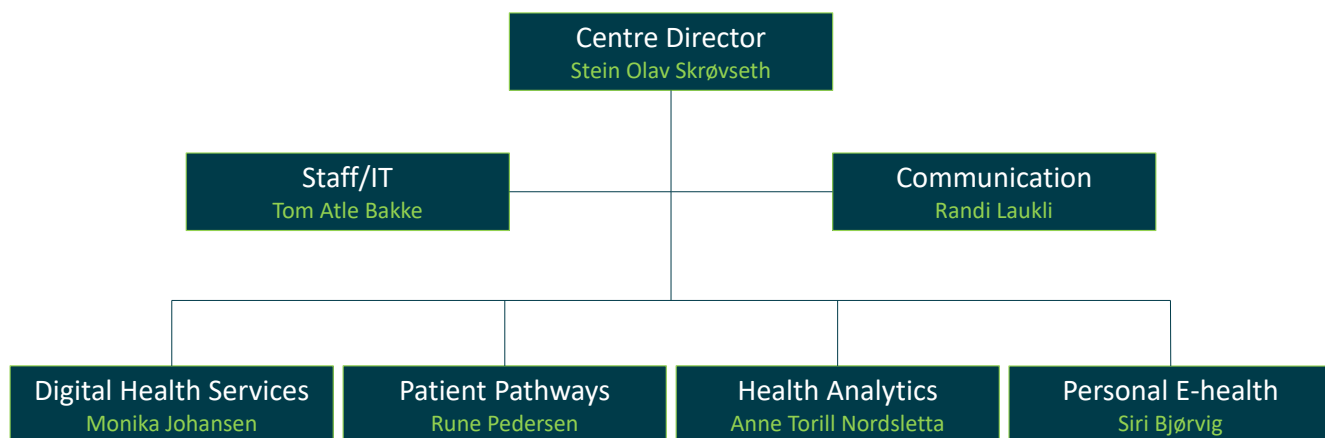
Level of education:

- Seven fellow researchers comprising four women and three men
- 45 with doctorates comprising 22 women and 23 men

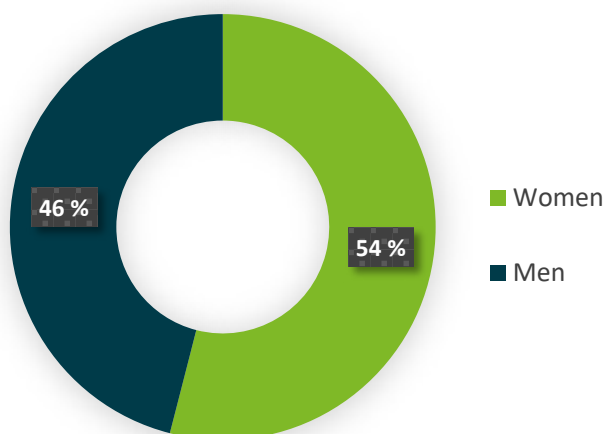
Where do we come from?

72 come from Norway and 28 come from:

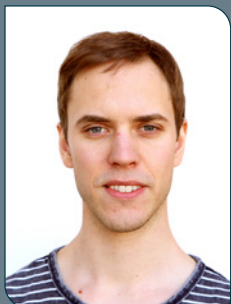
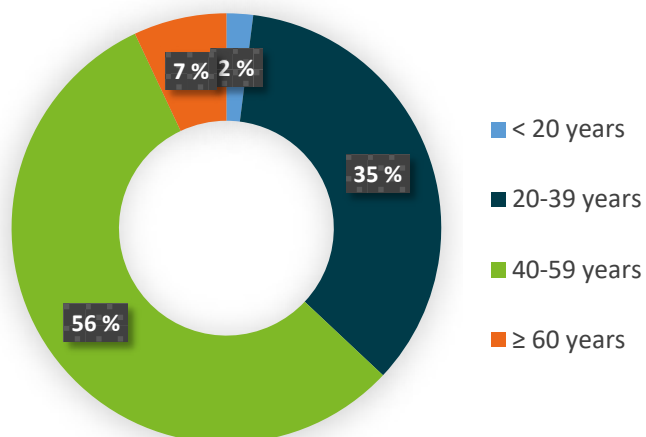
- Canada
- Ethiopia
- France
- Ghana
- Greece
- India
- Iran
- Iceland
- Italy
- Lithuania
- Portugal
- Russia
- Spain
- Sweden
- Czech Republic
- Germany
- USA
- Vietnam
- Zimbabwe



Gender distribution



Age distribution



Torje Dahle Henriksen – software developer, Dept. of Health Analytics

What was the best thing about 2021?

We have had loads to do in PraksisNett this year, and the work we do there is very exciting! I think there's been a very high level of activity across the centre as a whole in 2021.

Since I have been working remotely for years, I really appreciate our getting better digital collaboration tools at the centre, and that more people have gained experience in using them.

What's been best about the year is that we've been able to continue working in a fantastic team that I look forward to working with every day.

Digital or physical?

The solution is hybrid

The Norwegian Centre for E-health Research conducts research with and on the entire health and care sector. The insights our researchers provide are contributing to a knowledge-based digitalisation of health services. At the core of our work is the perspective of patients and citizens.

Research means less if society does not get to share in it. For this reason, we attach great emphasis on communicating our findings to our stakeholders, the authorities and decision makers.

For better or worse, we have once again been through a year of digitalisation. The shock-digitalisation we were talking about in 2020 has transformed into a greater maturity in the use of digital tools, but we are still finding our way forward towards the balance between physical and digital meetings.

In 2020, the centre received funding for many large projects, and in 2021 we spent a lot of time on start-ups up and recruiting the necessary expertise. There are lots of new faces to be seen in the corridors now that we are back in the office. It is a pleasure to welcome new co-workers, and we are pleased to see how our new colleagues have embraced the centre's values of openness, cooperation and integrity.

Our vision is that knowledge provides better health services, and we have delivered a great deal of sound knowledge this year. It goes without saying that the pandemic and the use of digital tools are reflected in very much of what we have done this year. We submitted, for example, a report on e-consultation and sick leave on behalf of the Ministry of Labour and Social Affairs. We have continued to focus on the pharmaceutical area, including follow-up research when the Patient medication list is to be piloted in West Norway RHA. We have provided knowledge to the Norwegian Directorate of Health and the national welfare technology program, and we are researching how the many pieces that make up the



*Centre Director
Stein Olav Skrøvseth*

puzzle of the patient's health service may be integrated with digital tools. In addition, several projects have given us new knowledge about artificial intelligence and personal protection technologies.

In the absence of physical meeting places, webinars became a larger part of everyday life during the pandemic, and the centre now has two webinar series. The series concerning medicine management started in 2020 and has become an important forum for sharing knowledge. In 2021, we started a new series about digital follow-up at home. This has rapidly become popular with many good speakers. Recordings of our webinars are subsequently made available online and contribute to the visibility of the centre.

In this way, the centre itself contributes to the knowledge-based development of the e-health field. We note, however, that the need for e-health research remains considerable and how important it is that we fill the role as a national centre and work together with the other knowledge communities in the area to ensure all needs are covered.

Stein Olav Skrøvseth, Centre Director

We twitter morning, noon and night

In order for people to know what we are working on and researching, we need to share a lot of content on social media. Experience suggests that it pays to be visible and attract followers on a selection of platforms, but not necessarily in all networks. In a way, the cases we share on social media determine 'who we are', how the general public perceives us. All the same, we do not meet the same people on Twitter, Facebook, LinkedIn and YouTube. And that's perfectly OK. Everyone has their favourites. Wherever we are, we want to be perceived as open and good to work with.

Facebook:

We have 2964 followers on Facebook.

**LinkedIn:**

3262 people follow us on LinkedIn.

**Twitter:**

Our Twitter account has 1430 followers.

**Instagram:**

792 people follow our centre on Instagram.



Media articles

In 2021, 36 different media outlets and websites referred to us in 93 articles. Forskning.no and Dagens Medisin are websites where healthcare professionals, authorities and others receive information about our centre and what we are researching.

ONSDAG 10. NOVEMBER 2021 29

DEBATT

Helsedata redder liv

HELSE

INGRID STENSTADVOLD ROSS
Generalsekretær, Krefteforening
LILLY ANN ELVESTAD
Generalsekretær, Funksjonshemmedes
Fellesorganisasjon
STIEN OLAV SKRØVSETH
Seniorleder,
Nasjonal senter for e-helseforskning

Covid-19 har vist oss hvor viktig det er å ha tilgang til helsedata i krise- og beredskapssituasjoner. Helsedata kan fortelle oss hvordan en pandemi brer seg, hvem som har størst risiko for å utvikle alvorlig sykdom, og hvilke bivirkninger en vaksine har. Slik kunnskap redder liv.

Gode helsedata er et norsk fortrinn og et gode vi bør bruke mer, for hele tiden å forbedre helsetjenestene til innbyggerne. Det forutsetter at helsedata brukes i tråd med befolkningsens interesser. HelseOmsorg21-rådet har derfor foreslått at det opprettes et innbyggerråd som kan ta opp problemstillinger som er viktige fra innbyggerens perspektiver.

Norge har lang tradisjon for å samle og bruke helsedata på en sikker og forsvarelig måte både fra pasientjournaler og befolkningsun-



Helsedata kan fortelle oss hvordan en pandemi brer seg, skriver innleggsforfatterne. Foto: NTB

Helsedata er samtidig noe av det mest sensitive vi har, derfor har alle løsninger personvern og sikkerhet som høyeste prioritet.

Ved bruk av helsedata kan forskere forstå mer om sykdommer og utvikle bedre medisiner og behandlingsmetoder tilpasset biologisk profil. Dårlig helse kan forebygges på et tidligere tidspunkt. Samfunnet kan ta opp problemstillinger som er viktige fra innbyggerens perspektiver, istedenfor å behandle sykdom som kunne vært unngått.

Du har rett til å være informert om, og ha en stemme i hvordan helsedataene dine lagres og brukes. For å kunne ha en egen mening om dette,

dataene vil bli brukt og hvordan vi eventuelt kan si nei til at dataene brukes.

Helsemyndighetene jobber for å gjøre helsedata mer tilgjengelig for forskere og skal gjøre det enklere å koble data fra forskjellige kilder. Det betyr vi på, men i arbeidet som nå pågår, er det viktig å legge til rette for åpenhet om bruk av data.

Et innbyggerråd kan bidra til å gi gode råd basert på befolkningens behov. Det bygger også tillit til bruken av dataene. Folk i Norge har stor tillit til offentlige myndigheter, og det er avgjørende at myndighetene forvalter denne tilliten klokt

Media articles about us – the top 10

Dagens Medisin	16
Forskning.no	12
Ministry of Health and Care Services	12
Rop.no	3
Psykologtidsskriftet	2
TV2	2
Dagsavisen	2
NTB Info	1
NRK Troms Radio	1
Diabetes	1



NRK Troms, 11. mai 2021:

«Folk i nord kan bli mer aktive med ONWARDS»

32 DEBATT

Helse-apper på eget ansvar?

Helsedata har mer verdi enn finansielle data. Dette bør være en tankevekker.

STADIG FLERE bruker helseapper, men tenker vi på de kan ha bivirkninger? Bruk av apper kan ha uønskede effekter. Den offentlige helsevesenheten tilbyr nå apper, og sikkerheten bør vurderes på lik linje med medisiner. Det kan skade oss om våre helsedata blir brukt på en måte som ikke er hensiktsmessig eller trygg.

I hovedsak utvikles helseapper av privatpersoner eller kommersielle aktører. Hvor lagres dataene som norske innbyggere genererer gjennom sine helseapper? Er de trygge?

Vi vet lite om hvordan de brukes/misbrukes, men vi vet at helsedata har mer verdi enn finansielle data. Det bør være en tankevekker. Medisiner har demonstrert hvor lett apper kan brukes til å misbruke i folkets private. Om vi kan bruke apper til å misbruke i folkets private, kan disse helsedataene komme på ansvarens vei. Vi vet lite om hvordan vi skal beskytte våre helsedata fra kommersielle eller kriminelle aktører.

KVALITETSSIKRING. Det er ikke sikkert at det holder å stole på andre lands erfaringer når det gjelder helseapper. I USA har 200 millioner menneskers helsedata blitt kompromittert siden 2000, noe som stiger over 50 prosent av befolkningen. Helsedata lekes daglig. Kanskje vi må se på det som et problem, og ikke som en mulighet.

I rapporten Trygghet helseapper oppsummerer HelseOmsorg21-rådet hvor trygghet i helseapper i større grad berører tilrettelegging for kvalitetssikring og bruk av helseapper. Informasjonsmiljøet skal være et sentralt element i dette konseptet. HelseOmsorg21-rådet har også utarbeidet en liste over de viktigste appene som er i bruk og som kan sette seg

Kronikk



Celia Nilsson, seniorrådgiver i adferd og personlig e-helse ved Nasjonalt senter for e-helseforskning



Erik Arstad, professor i helse, teknologi og e-helse, Nasjonalt senter for e-helseforskning og UH Norges arkiverte universitet



Johan Gustav Bakk, professor i medisin og informatikk ved Nasjonalt senter for e-helseforskning og UH Norges arkiverte universitet

inn i tjenestens brukervilkår. Er det nok? Ville man ha akseptert å bruke reseptbelagte medisiner som ikke er risikofritt, eller som eksperter ikke har deklart bruk av? Ville man ha tatt i bruk en medisin fordi den har god virkning uten at man har vurdert mulige bivirkninger?

Nylige erfaringer med koronaviruser gir oss et bilde av hvordan dette kan gå.

SÅRBARE GRUPPER. Sikkerhet forberedes mot elektronisk medisin, og det har fått handlingsplaner i Rikets regjering. En rapport av desember 2020 oppgir vesentlige avvik ved anskaffelse av innleggspumper for barn.

Diabetespasienter bruker ofte en insulinpumpe og en blodglukosemåler, koblet til en app, for å overvåke blodglukosenivået. Ved overvåking kan appen hjelpe barn med diabetes til å holde seg i mål.

I dag er helseapper gjerne rettet mot aldersgruppen. Kan personer med for eksempel astma eller sykdom i hjertet, eller i tarm, bruke apper til å holde seg i mål?

I dag er helseapper gjerne rettet mot aldersgruppen. Kan personer med for eksempel astma eller sykdom i hjertet, eller i tarm, bruke apper til å holde seg i mål?

LEDDAG. Vi foreslår konkrete tiltak for trygghet i bruk av helseapper. Helseapper bør få egne «pakningsvedlegg». Eksempel på informasjon i



Sikkerhet! – Tenk på at helseapper kan ha bivirkninger! Iper artikkelforfatterne, som mener at vi vet lite om hvordan helsedata kan beskyttes fra kommersielle eller kriminelle aktører. Foto: Colourbox

et slik vedlegg kan være «ekskluderte mulige bivirkninger. Appen leveres per i dag av et norsk firma, men dersom dette blir kjøpt opp av et utenlandsk firma, kan disse helsedataene komme på ansvarens vei. Da ville brukeren være informert.

Myndighetene bør tilgjengeliggjøre informasjon om hvilke aktører som leker helsedata. Appen leveres per i dag av et norsk firma, men dersom dette blir kjøpt opp av et utenlandsk firma, kan disse helsedataene komme på ansvarens vei. Da ville brukeren være informert.

Myndighetene bør tilgjengeliggjøre informasjon om hvilke aktører som leker helsedata. Appen leveres per i dag av et norsk firma, men dersom dette blir kjøpt opp av et utenlandsk firma, kan disse helsedataene komme på ansvarens vei. Da ville brukeren være informert.

Myndighetene bør tilgjengeliggjøre informasjon om hvilke aktører som leker helsedata. Appen leveres per i dag av et norsk firma, men dersom dette blir kjøpt opp av et utenlandsk firma, kan disse helsedataene komme på ansvarens vei. Da ville brukeren være informert.

Myndighetene bør tilgjengeliggjøre informasjon om hvilke aktører som leker helsedata. Appen leveres per i dag av et norsk firma, men dersom dette blir kjøpt opp av et utenlandsk firma, kan disse helsedataene komme på ansvarens vei. Da ville brukeren være informert.

Myndighetene bør tilgjengeliggjøre informasjon om hvilke aktører som leker helsedata. Appen leveres per i dag av et norsk firma, men dersom dette blir kjøpt opp av et utenlandsk firma, kan disse helsedataene komme på ansvarens vei. Da ville brukeren være informert.

Forskning.no



Bruk av ustrukturerte data er ikke fullt ut utforsket og utnyttet, men denne typen data har et enormt potensial. (Illustrasjon: Colourbox)

Ustrukturerte data fra pasientjournaler kan gi bedre behandling

Mesteparten av helsedata til pasienter er ustrukturert data som legemotat, e-poster og medisinske bilder. Nye analysemetoder vil være et gode for både behandling og helse.

Hanne Beutten
FORSKUNGSRADETSLEDER

Nasjonalt senter for e-helseforskning

Freitag 23. april 2021 - 04:30

Facebook Twitter LinkedIn

Instagram YouTube

WhatsApp Messenger

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Slack

Discord

Signal

Telegram

Skype

Finances

Accounts for 2021. Figures indicated in MNOK.

OPERATING REVENUE

Total revenue competitive funds	32.9
Total basic funding	43.2
Total revenue assignment funds	2.6
TOTAL operating revenue	78.8

OPERATING COSTS

Direct project costs	6.8
Payroll and social costs	62.5
Other operating costs	9.5
TOTAL operating costs	78.8

OPERATING RESULT 0.0

Operating result transferred to balance sheet 0.0

PROFIT/LOSS FOR THE YEAR..... 0.0

14

What is important to you?

**Kari Dyb – Senior Researcher,
Dept. of Digital Health Services**

What was the best thing about 2021?

The best thing about 2021 was that we received approval for a large Research Council application to start up the international research project eMM. With start-up in August 2021, the goal of the project is to produce new knowledge about how digital medicine management can contribute positively to a unified health and welfare service for the future. These funds provide

good opportunities to produce more social science knowledge about digital medicine management.

What was most important for the project in 2021 was that we employed two extremely competent PhD students. Stine and Henriette are both social scientists and started their research careers in January 2022. Line Lundvoll Warth and I are those who are most involved in eMM from E-health research. We are looking forward to three exciting years with our project.



Knowledge for improved healthcare services

The Norwegian Centre for E-health Research shall contribute to evidence-based development within the field of e-health through research, cooperation and dissemination.

Through interdisciplinary research and knowledge development, we wish to help improve healthcare services for citizens. Together with the entire sector, we shall achieve the national goal for patient care services.

Our ambition is to be a leading national research centre of international recognition.

Our vision is: Knowledge for better health services.

Our most important task is to conduct research with other professional communities, both nationally and internationally. Our research must be independent and maintain high ethical standards.

The dissemination of knowledge is a core activity, and all our research will be published openly and made readily accessible. We shall endeavour to ensure that the knowledge is utilised.

Through our national role, we will build a network and cooperate with the entire sector. Everyone who researches e-health will be able to participate.

Personal e-health

We will conduct research into how technology designed for independency and self-management impacts healthcare for the elderly, the chronically ill who need monitoring and those who actively aim to change their lifestyle.

Digital health services

We shall conduct research on national digital healthcare services and acquire knowledge of what conditions and contexts need to be in place before the services can be developed. While the services are being tested, we shall look at what prevents or promotes usage. Finally, we will study the effects and consequences of using the services. Digitalisation of medicines and the services offered on Helse-norge.no are important themes.

Holistic patient pathways

We shall study how digital solutions can facilitate holistic patient pathways.

Technological, semantic and organisational collaboration is challenging in healthcare services and we will look at patients' health records as a collaboration tool. We will investigate how strategies for implementation, standardisation and work processes impact quality.

We will conduct research on conditions for, and the effects of, digitalisation with the aim of understanding the complex interaction between technology and healthcare services.

Health Data Analytics

We will look at how health data can be used to predict, detect and treat illness.

Machine learning algorithms and data extraction methods are two areas that we are studying. We will develop methods for both analysing data and safeguarding privacy.

A key theme is how the health sector can adopt reliable and sustainable algorithms.

Vision and values

Our vision is knowledge for better health services.

Values

Our values are crucial to our success over time and are at the heart of our culture. They motivate us to perform and guide us as to how we should run the centre and cooperate with our stakeholders.

Openness

Openness is one of the most important values in our organisational culture and helps to ensure transparent processes. By making our activities transparent and sharing knowledge and information, we build trust in our cooperation partners and society.

Openness demonstrates a desire to learn, to be curious of others and receptive to new ideas. This also entails the ability to give and receive constructive feedback. We positively encourage different opinions.

Cooperation

E-health is an multi-disciplinary field, and no one is capable of doing everything on their own. Cooperation is therefore something we

hold in high regard. We often cooperate with those we compete with for funding. Trust lies at the heart of any good cooperation. Trust and mutual respect makes working together a pleasant experience. Inclusion is the key to building a community, and being part of a community provides a sense of belonging, friendship and wellbeing. By including others, both internal and external cooperation partners, we work more efficiently towards our common goals.

Integrity

To us at the Norwegian Centre for E-health Research, integrity means being reliable and conducting ourselves properly. We are characterised by doing what we say. We are confident that we want the best for each other and that everyone is doing the best they can. Quality should be the hallmark of what we deliver.

It is important that we solve our public mission as best we can, which is why we must set clear expectations for the centre and our co-workers. Our organisation wants autonomous, committed employees who take co-responsibility for the centre's success. We must be able to depend on each other for support, even when we make mistakes.

**Célia Nilssen – Senior Adviser,
Dept. for Personal E-health**

What was the best thing about 2021?

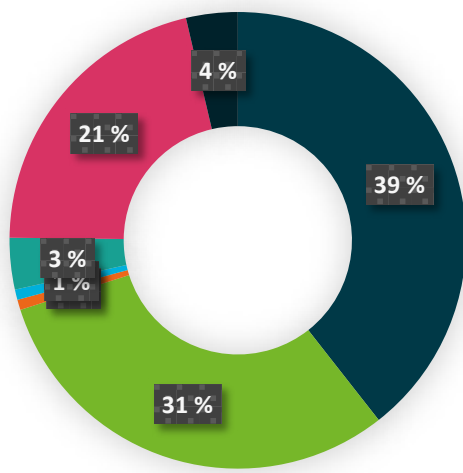
The year has been very much affected by the pandemic. On the one hand, I felt lucky that my working day at the centre was little changed as a result of home office periods. On the other hand, international cooperation has been affected by unpredictability and difficulties in meeting physically. The best thing about the year has been going to work every day and working in an interdisciplinary team with skilled

colleagues who bring out the best in each other and share their knowledge. Working on projects that unite different disciplines is incredibly rewarding.

Participating in the design of our new office premises has been an important part of our working day in 2021. It was interesting to work with all the departments at the centre and to contribute to something that will hopefully benefit all employees. The fact that the working group for this process consists of a fantastic, solution-oriented team has really had a positive influence on the work!

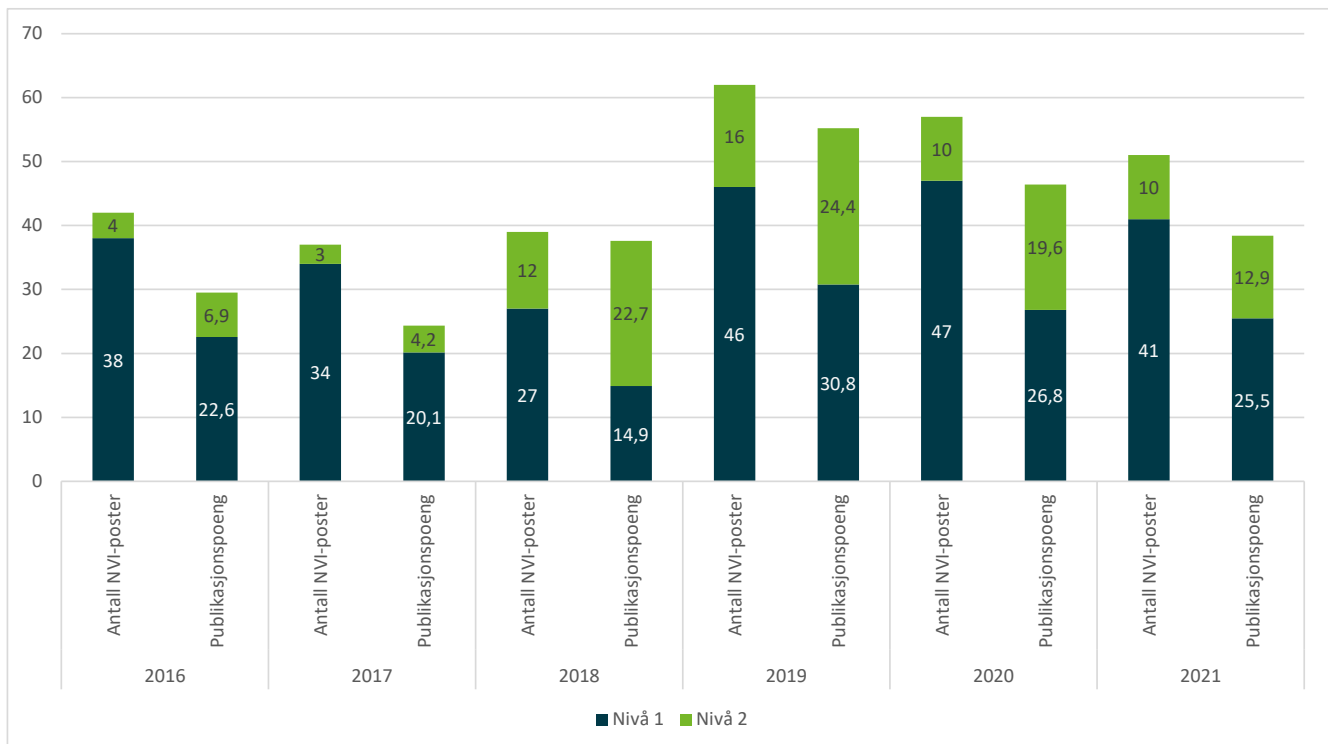


Research figures



- 54 scientific articles/overview articles
- 42 scientific/academic lectures and poster presentations
- One scientific chapter/article/conference article
- One abstract
- Five chronicles
- 29 popular science articles
- Five reports

Figures from Cristin



NSI: Norwegian Scientific Index

NSI publications: Publications that earn publication points and are part of the funding schemes in the healthcare, institution and university hospital sector



Research cooperation



North America

Canada

- St. Joseph's Healthcare Hamilton
- University of Saskatchewan
- The University of Regina

USA

- Oregon Research Institute
- Medical University of South Carolina
- McLean Hospital
- Mayo Clinic, College of Medicine
- Massachusetts General Hospital
- University of Texas at Austin
- Yale New Haven Health, New Haven, Connecticut
- The Ohio State University
- Northwestern University
- Harvard Medical School
- University of Colorado at Boulder
- Louisiana State University

South America

Brasil

- Universidade Federal de Juiz de Fora
- Graduate Program in Rehabilitation Sciences, Nove de Julho University, São Paulo

Europe

Belgium

- HL7 International Foundation Europe

Denmark

- Hvidovre Hospital

Finland

- Oulun yliopisto

France

- Université Paris-Saclay

Greece

- University of Crete

Ireland

- The University of Dublin, Trinity College
- SilverCloud Health, Dublin
- Clinical Research & Innovation, Dublin

The Netherlands

- Universiteit Twente
- Universiteit Maastricht
- Universiteit Leiden
- Technische Universiteit Delft
- Amsterdam Public Health research institute
- Vrije Universiteit Amsterdam
- Universiteit van Amsterdam
- Tilburg University
- School of Applied Psychology, Fontys University of Applied Science, Eindhoven
- PsyQ Online, Haarlem
- National Health Care Institute
- Amsterdam University Medical Centre, Amsterdam
- Secura, Eindhoven

Norway

- University of South-Eastern Norway
- University of Bergen
- University of Agder
- OsloMet - Metropolitan University
- Oslo University Hospital Trust
- NAV Norwegian Labour and Welfare Administration
- South-East Norway RHA
- St. Olav's Hospital HF
- SINTEF AS
- Østfold University College
- Norwegian University of Science and Technology
- University of Oslo
- UiT The Arctic University of Norway

Poland

- Politechnika Poznanska

Portugal

- Department of Social Action and Health, Santa Casa Da Misericórdia De Lisboa (SCML), Lisbon

Spain

- Universitat de Barcelona
- Universitat Jaume I de Castellón
- Instituto de Salud Carlos III
- Universidad de Sevilla
- Miguel Servet University Hospital

United Kingdom

- University of London
- University of Leeds
- University of Cambridge
- University of Bristol
- Pearson
- National Institute for Health Research
- University of York
- University of Oxford
- University of Nottingham
- Imperial College London
- Metronix Ltd., Watford
- Brighton and Sussex Medical School

Switzerland

- Bern University of Applied Sciences
- Hôpitaux Universitaires de Genève
- Universität Bern
- Berner Fachhochschule



Sweden

- Stockholm läns landsting
- Linnéuniversitetet
- Linköpings universitet
- Karolinska Institutet
- Göteborgs universitet
- Stockholms universitet

Germany

- Universitätsmedizin Göttingen
- Technische Universität München
- Fachhochschule Furtwangen - Hochschule für Technik und Wirtschaft
- Charité - Universitätsmedizin Berlin
- Universitätsklinikum Hamburg-Eppendorf
- Universität zu Lübeck
- Friedrich-Alexander-Universität Erlangen-Nürnberg
- Freie Universität Berlin

Asia

United Arab Emirates

- United Arab Emirates University

Iran

- Shahrekord University of Medicine and Science
- Isfahan University of Medical Sciences
- Mashhad University of Medical Sciences

Israel

- Ono Academic College

Japan

- Kyoto University Graduate School of Medicine/School of Public Health

China

- China Academy of Chinese Medical Sciences

Oceania

Australia

- University of New South Wales
- The Prince of Wales Hospital & Community Health Services
- The Australian National University
- Austin Health
- Monash University
- La Trobe University
- University of Sydney
- St Vincent's Hospital
- Department of Respiratory and Sleep Medicine, Austin Hospital, Melbourne
- Physiotherapy, Alfred Hospital, Melbourne, Victoria

- University of New South Wales at the Black Dog Institute
- Wimmera Health Care Group, Horsham, Victoria
- Physiotherapy, Western Health, Footscray, Victoria
- West Wimmera Health Service, Nhill, Victoria
- Allied Health Research and Education Unit, Sydney Local Health District, Sydney
- Community Rehabilitation, Wimmera Health Care Group, Horsham
- Physiotherapy, Alfred Health, Melbourne
- Institute for Breathing and Sleep, Melbourne
- University of Melbourne

New Zealand

- University of Otago

Adding knowledge through webinars

Sørlandet Hospital, Østfold Hospital, National Institute of Public Health, University of Oslo, West Norway RHA and South-East Norway RHA: these are some of the many participants to have held lectures for curious listeners in our webinars.

One of the webinar series we present is called Digital Follow-up at Home This is a collaborative project between the University of Agder, Sunnaas Hospital, Livsglede for Eldre and the Norwegian Centre for E-health Research.

The webinar series Digital Medicine Management is a collaborative project between Østfold Hospital, Southern and Eastern Norway Pharmaceutical Trust, the University of Oslo and ourselves.

The live transmission, which are also recorded for later viewing, have proved to be very popular meeting points. We want professional, coordinated health services for everyone, to the benefit of users, patients, relatives, health

personnel, suppliers and authorities. Good quality is essential, regardless of whether the services are provided at national or municipal level.

Cross-disciplinary cooperation – listening to others' experiences and wanting to learn and develop together - thus becomes very important. At the same time it is important to both dare to ask questions and to be critical of what is being said. The world has become extremely complex, and the same goes for challenges within the healthcare sector. This requires that we who work with research into innovation and the use of technology in healthcare make use of multiple perspectives as a point of departure, so that we can arrive at solutions to provide positive change.

It is good to see that so many of our partners are contributing to this important arena. The many different topics contribute to high quality webinars and a rich learning outcome.

Those attending the webinars are always served something exciting and useful. Pictured: Anne Gerd Granås and Unn Sollid Manskow.

The screenshot shows a Zoom webinar interface. The title bar at the top reads "Digital legemiddelhåndtering: en webinarserie". The main content area displays a presentation slide titled "Mulige løsninger" (Possible solutions). The slide is divided into two columns: "Mer teknologi" (More technology) and "Mer menneske: Involvere brukerne / pasientene" (More human: Involve the users / patients). The "Mer teknologi" column lists 12 items, with the first 10 numbered. The "Mer menneske" column lists three bullet points. To the right of the slide, two participants are visible in a video call. The top participant is a woman with glasses, and the bottom participant is a man with glasses. The Zoom interface includes standard controls like "Se senere" (Watch later) and "Del" (Share) in the top right corner.

Digital legemiddelhåndtering: en webinarserie

Mulige løsninger

- Mer teknologi

 1. Lukket legemiddelsløyfe
 2. Strekkodemerkning
 3. Legemiddelkabinett
 4. Endose og digitale legemiddeltraller
 5. Regionale standarder
 6. E-kurve og digital legemiddelflyt
 7. Helseplattformen
 8. Kjemiejournal
 9. Pasientens legemiddelliste
 10. Skreddersydd legemiddelinformasjon til pasientene
 11. Beslutningsstøtte (MetaVision)
 12. Maskinlæring

- Mer menneske: Involvere brukerne / pasientene

 - Mennesket er sjefen, teknologien en hjelper
 - Bedre tilgang til egen legemiddelinformasjon
 - Styrke informasjonsforståelse hos pasientene

UNIVERSITETET I OSLO

Side 2

Skilful Nora MacLaren from E-health research manages the webinars with a steady hand and has a key role in ensuring that the result is good.



21

The webinars in figures

In 2021, the Norwegian Centre for e-Health Research arranged two webinar series together with our partners. Here are a few key figures.

Digital medicine management:

- 16 webinars in 2021
- Number of participants: 2567 (65 % of enrolled)
- Average number of participants per webinar: 160
- Number of views on YouTube: 1784
- Most participants from hospitals, pharmacies, authorities, private sector

ehealthresearch.no/digital-legemiddelhandtering/webinarer

Digital follow-up at home:

- Seven webinars in 2021
- Number of participants: 668 (53 % of enrolled)
- Average number of participants per webinar: 95
- Number of views on YouTube: 1261
- Most participants from local authorities, hospitals, education/research, private sector

ehealthresearch.no/digital-hjemmeoppfolging/webinarer

International cooperation brings new perspectives

Other countries often have different ways of doing things. Our researchers cooperate on a broad international basis.

Senior Researcher Paolo Zanaboni is one of them. He heads a project financed by the Norwegian Research Council. The project is looking at e-consultations with GPs: The large-scale implementation of e-consultations with the GP: a mixed-methods evaluation of the impact on health system, GPs and patients.

‘In this project we have two cooperation partners from England: Chris Salisbury from the University of Bristol and Helen Atherton from the University of Warwick. They are to give advice on various topics, contribute to the collection and analysis of data and of course participate in the publication of research results,’ explains Paolo, who is happy to have international expertise in his project.



Professor Chris Salisbury is a professor in primary healthcare services and a senior researcher at NIHR. He has published five books and over 230 scientific publications on the broad topic: how to improve provision to the primary health care service.

Read more on our website

ehealthresearch.no/prosjekter/e-konsultasjoner

Helen Atherton is an associate professor of primary health care research and digital health manager at the Unit of Academic Primary Care, Warwick Medical School. She is an expert in the use of digital access to GPs and alternatives to face-to-face consultation, such as email and video.



Cooperation with the World Health Organization

Many of our deliveries to the World Health Organisation (WHO) were about contributing knowledge about the effects of Covid-19. We received both large and small requests from WHO throughout the year.

In January, we contributed with an assessment of a concept document. The aim was to create a plan to establish telemedicine services in Turkey. There is a need to strengthen access to primary health care, especially for vulnerable groups such as the elderly and migrants.

After their contacting us, we held discussions and wrote a joint application for research funding together with the Robert Koch Institute (the German Institute of Public Health). The goal was to develop e-health solutions and strengthen first-line services in Uzbekistan. Innovation in the primary health care service is necessary to deal with problems of health inequality and lack of access to help.

Several colleagues from the centre wrote a short report together with WHO on the use of e-health tools in the Norwegian primary health service during the corona pandemic. Both local authorities and the health service undertook adjustments and used digital tools to deal with the pandemic.

In the autumn, we participated in a seminar in the Research Park at UiO with people from UNICEF's head office as well as Norwegian researchers and health tech companies. The topic was how knowledge from e-health research can contribute to innovation and smart solutions globally where there is a great need for health care.

In November, the WHO Coordinator attended the first regional meeting of WHO cooperation centres in Europe. There are 290 cooperation centres in 34 countries across the European region. Globally, there are over 800 centres. Among other things, we were responsible for a virtual session on digital inclusion. The aim of the meeting was to share experiences and identify priority areas for future collaboration. It was exciting to meet so many skilled people from across a huge range of disciplines.

Read more on our website

ehealthresearch.no/en/who

Marte Broks – Advisor, Dept. of Patient Pathways

What was the best thing about 2021?

I started here in January 2021 and work part time. So the best thing for me in 2021 was to gain better insight into all the exciting research work that takes place at the centre and to get to know many of the wonderful, talented people who work here.

Perhaps most important has been to gain clarity about where I wish to go with my research. I have decided to take a PhD, and have gradually got under way with a lot of good help and support from those around me.



Article about our work with a WHO report in Dagens Medisin, Sept. 2021.



RAPPORTEN: Skjermåpning fra WHO.

Ny rapport om e-helse: Kjempeøkning i pandemien

Nasjonalt senter for e-helseforskning har laget et sammendrag av erfaringene fra primærhelsetjenesten under pandemien som er publisert av WHO.

Anders Zerener
anders.zerener@dagensmedisin.no

Publisert: 2021-09-16 — 13.45



Selv om mye av teknologien var på plass før pandemien, gikk ikke alt som smurt, kommer det frem.

I januar 2020 hadde så mange som 1/3 av fastleger i landet mulighet til å tilby e-konsultasjoner, men e-konsultasjoner utgjorde likevel i underkant av tre prosent av konsultasjonene som ble gjort.

Flere positive faktorer

Det fikk fort et enormt oppsving: allerede i april 2020 ble 41 prosent av konsultasjonene i landet gjort via video, tekst eller telefon, står det i rapporten. Et drøyt år etter at pandemien inntraff, hadde nærmest alle fastleger i landet tilbud om e-konsultasjon, og i april 2021 sto e-konsultasjoner for 27,3 prosent av samtlige konsultasjoner.



Digital meetings speed up health app development

The pandemic put a stop to all physical meetings for design work relating to a new health app. The researchers were positively surprised by the benefits of completely digital meetings.

When corona hit, researchers Berglind F. Smaradottir and Asbjørn J. Fagerlund at the Norwegian Centre for e-Health Research were in full swing developing a health app for chronic pain patients. User participation, moreover, is a key element in the work. If those intended to use the app are not involved in its design and functionality, it is hardly likely to be a success.

Such health apps must be easy to use and offer good health advice. Thus patients have to be involved in deciding what they should look like.

Gave input from their own living-room

It was originally intended that the six participants from the Norwegian Fibromyalgia Association would meet the researchers on four occasions in 2020 to provide input to the

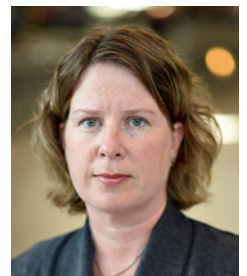
app's design and functionality. When there was a sudden stop to physical work meeting, the researchers had no option but to employ a fully digital solution.

Users were then able to provide feedback on the app design through Whereby video-conferencing from their living-rooms instead. The researchers feared that the results would not be the same. But what happened surprised them.

'We found that the digital work meetings where users were to give us input worked much better than expected,' says Berglind F. Smaradottir.

Shorter journeys and a lower threshold

They have a clear recommendation for others with projects where user participation is important: While they may seem unfamiliar, there are benefits to digital meetings. One example is the travel aspect. A significant amount of logistics is required to get ten people to travel somewhere to be in a workshop for a whole day. It has to be planned



Senior Researcher
Berglind Smaradottir



Senior Researcher
Asbjørn Johansen
Fagerlund

Ivar Thor Jonsson, Director of the Dept. of Pharmaceuticals, the Directorate for E-health

What was the best thing about 2021?

Most important for me is that we have finally started testing the patient medication list (PLL) in Bergen.

Thanks to good, close cooperation with the actors in the health service, we have got off

to a good start with the trial, and this will give us valuable learning and opportunities for improvement when planning a full national introduction of PLL.

The cooperation with the Norwegian Centre for E-health Research is very important to us in the trial, and gives us a good starting point for systematising and documenting learning and experiences along the way.

Long may it continue!





well in advance and the dates must be suitable for everyone. That is not the way it is when your PC is in the other room and you don't need to take an express ferry and bus to get to a meeting.

Just as active digitally

The researchers were concerned as to whether the project participants would be equally active as when they attended physical workshops. It turned out they need not have worried.

'We discovered it was important to provide directions, like making sure everyone got a turn to speak, for example. It wasn't difficult to get them to speak freely but some tended to fade into the background,' says Fagerlund.

That is why there are always two people to lead the meeting – in order to get hold of all the patients' experiences. One has the main responsibility for keeping track of remarks and when anyone raises their hand.

Want to continue after corona

The researchers believe the technology adds more to the development of the app. It has given them the impetus to think anew, which may have transfer value to other projects.

For this reason, they have decided to continue with digital meetings even when the pandemic is over. They think the technology provides unforeseen possibilities.

'We're thinking of combining digital and physical meetings in future. We're about to enter a phase where we test the health app alongside the users. We usually use a lab, but now we're going to find out how we can solve this digitally. Now that we've begun working remotely, we're excited about what else we can do. It's going to be very interesting,' says Berglind F. Smaradottir.

Reference:

Berglind F. Smaradottir mfl.: User-Centred Design with a Remote Approach: Experiences from the Chronic Pain Project. Studies in Health Technology and Informatics. IOS Press, 2020. Doi:10.3233/SHTI200722

Greta Thunberg's diagnosis makes her both a role model and a lightning rod

She has noticed that there are many myths about autism.

Twitter can be seen as a barometer of social involvement and a window on to the power of definition. By looking at data from Twitter and other places, three researchers from Østfold University College and one from the Norwegian Centre for E-health Research have looked at what engaged and occupied people about autism, Asperger's syndrome and Greta Thunberg during 2019.

'The main goal of the study was to investigate the interest in, feelings about, and opinions and attitudes to autism, Asperger's syndrome and Greta Thunberg during 2019, a year in which Thunberg received a lot of attention,' says researcher Ingjerd Skafle at Østfold University College. The findings from the study have been published in the International Journal of Environmental Research and Public Health.

Considerable activity on social media

In the study, the researchers used various methods to analyse emotions and attitudes in viral Twitter messages. They have gone through 1074 viral tweets about autism that were published during 2019. These were tweets which received more than 100 likes. The sample from Twitter was compared with search patterns from Google. Of the total sample of viral tweets talking about autism, Thunberg was mentioned in 83 per cent.

Breaking barriers

Thunberg has perhaps noticed more than anyone else that there are many myths about autism.

The young Swedish climate activist has been open about her having Asperger's syndrome. This has led to praise from many people, while critics have put forward incorrect claims linked to her autism diagnosis.

Researchers believe social media are helping break down barriers and giving users the power of definition. Their engagement can exert considerable pressure on politicians, companies and individuals alike.

'Although Greta Thunberg has received many negative comments on social media because she has been open about her diagnosis, she has also proven to be seen as a great political driving force and a role model for many people,' says senior researcher Elia Gabarron in the department of personal e-health at the Norwegian Centre for e-Health Research.

She says this is encouraging for others with a disorder on the autism spectrum who want to participate in debates on social media while being open about their state of health.

Increased awareness of autism

Earlier studies have shown that social media attention can be positive for increasing awareness about autism, but the attention and contact with users on social media is complex and diverse. Media attention and autism in more traditional media such as newspapers, film and TV have also been looked at previously. Traditional media are more controlled, while social media are open to everyone. That makes it easier to voice an opinion.

This new study shows that social media, as exemplified by Twitter, contributed both positive and negative opinions about autism and Asperger's.



Senior Researcher
Elia Gabarron



'Our study shows that many people regard Thunberg as a role model because she is an environmental activist who has achieved a great deal. Some are impressed by her becoming such a driving force in the climate debate while being so young and additionally having Asperger's syndrome. Others use the diagnosis against her and call her psychologically ill or unstable, claiming that she isn't a trustworthy political activist precisely on account of her diagnosis,' says Ingjerd Skafle.

Role model and lightning rod

Thunberg has been very clear that her autism diagnosis is not a hindrance but rather a reason behind her being where she is today.

"I have Asperger's syndrome, and that means I'm sometimes a bit different from the norm. And – given the right circumstances – being different is a superpower," she once said. When the researchers analysed Google Trend data for 2019, they found that the term 'Asperger's' was very closely connected with Thunberg.

On Twitter, she was an object of debate about her person and about her opinions in the climate-change debate, but her Asperger's diagnosis also received a lot of attention and interest. The study shows that being open about one's own health information while being an active participant in controversial debates on social media can attract both positive and negative attention. At the same time, it can contribute to breaking down stigma and stereotypes.

Reference:

Ingjerd Skafle mfl.: Online Attitudes and Information-Seeking Behavior on Autism, Asperger Syndrome, and Greta Thunberg. Int. J. Environ. Res. Public Health, 2021. Doi.org/10.3390/ijerph18094981

More thorough analysis of health data can bring patients better treatment

Algorithms that calculate health conditions can become a new, improved better method of personalising treatment.

Most data about patients is unstructured. This applies to doctor's notes, radiology and pathology reports, epicrisis and medical images that doctors and other health personnel store in our journal.

'We estimate that about 80% of patient data is unstructured. This presents a few challenges,' says Alexandra Makhlysheva.

Along with other researchers at the Norwegian Centre for E-health Research, she has written a report about electronic phenotyping in patient treatment.

Within genetics, phenotypes are the characteristics of an individual that can be observed directly, such as appearance, colour, size, intelligence and state of health. Using systematic analyses, researchers can thus find specific characteristics in health data.

Electronic phenotype algorithms are computer programs that analyse patient data. The goal is to find patterns and characteristics for a condition in patients or to predict the risk of the condition.

Automatic analysis

The researchers study data about the patient in the electronic patient record and from other sources. They gather all kinds of data to get the most information possible about patients.

Patients with the same illness may react differently to treatment. It may work well for some and not so well for others. The goal is to adjust

treatment as well as possible. In order to be able to do this, researchers need very large sets of data. In analyses of text and language, researchers must use computer programs with processing of natural language. They want to know more about characteristics that characterise the patient's condition, technically known as the phenotype.

'We can get this information, for example, from lab samples, medicines, notes in free text and genomic data,' says project manager Alexandra Makhlysheva.

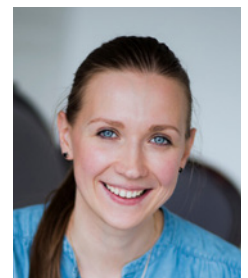
What is best, for whom?

The researchers studied elderly patients who had multiple chronic diseases. Some were referred to a patient-centred health service team, in a project led by Professor Gro Berntsen at the Norwegian Centre for E-health Research.

The researchers developed an algorithm, a computer program, which collected and analysed a large data set from health care teams, hospitals and municipal health services. This algorithm found the benefit that patients had from treatment. On that basis, the researchers found criteria for patient referral in future.

Can make processes more effective

Findings from such electronic phenotype algorithms will be useful for health professionals in the primary and specialist health services, as well as public health services at the national level. The researchers believe that the digging for data in patient records can also be used for administrative purposes.



Senior Adviser
Alexandra Makhlysheva



'Are the machines going to check us and then take over management of our treatment?'

'No, the machines can help support decision making. It is the clinician or the administrative staff member who must decide what they want to do - or not do,' says Makhlysheva.

Diagnosis codes

She points at code support as another area where algorithms could help. After every patient contact, doctors register diagnosis codes describing treatment and procedures,

'These codes are collected and used at a higher level to measure activity at hospitals,

as well as to determine the hospitals' reimbursement from the state, what we call effort-driven financing. However, about 40% of the coding could be wrong,' she says.

Incorrect coding makes it difficult to direct resources in the health service in an efficient manner. The phenotype algorithm can analyse patient journals. It can put forward diagnosis codes to help clinicians choose correctly.

In the ClinCode project, researchers at the Norwegian Centre for E-health Research shall produce an algorithm for code support. Here they will be collaborating with a patient record provider to find out how the algorithm can be built into the record.

Reference:

Alexandra Makhlysheva m.fl.: Utforsking av elektronisk fenotyping for klinisk praksis. Rapport fra Nasjonalt senter for e-helseforskning, 2020.

Health staff struggle to get hold of information about the medication their patients use

A shared digital medication list is soon on the way. It will solve many problems, say researchers.

When medicines are used correctly, patients get improved health and an increased quality of life. Today, however, we have major challenges with access to updated information about which medications the individual patient should have. Every year, about 1,000 people die in Norway owing to incorrect medication. Around 12% of all patient injuries are owing to incorrect drug use. This is also the reason for 5-10 percent of admissions to medical departments, according to figures from the Directorate for e-Health.

Systems that do not share information

A new preliminary study shows that healthcare professionals find it difficult to access correct, up-to-date information about patients' use of medication. The current computer systems do not share important information. Consequently, they are not up to date concerning changes to patients' treatment. This takes up a lot of health professionals' time and resources. It can also compromise patient safety and the quality of treatment. For this reason, the health authorities are introducing what is called the Patients medication list (PLL). Here, information about patients' treatment is going to be made available through one shared digital overview. In this way, health professionals will gain better access to up-to-date information.

The article was published in the periodical Pharmacy. Behind the article are Head of Project and senior researcher, Unn Sollid Manskow, and project co-worker and researcher Truls Tunby Kristiansen, both from the Norwegian Centre for E-health Research. They work with follow-up research on the Patient's medication list (PLL).

Where do they find the information about patients' treatment?

The two researchers investigated how health personnel currently collect and exchange information about medication used by their patients. This is important because it is only in this way that researchers will be able to note any changes after the introduction of PLL. Will access be easier and better or will new challenges crop up?

'We found that GPs, nurses and pharmacists often feel cut off from information about patients' use of medication. Most people associate it with systems that do not talk to each other,' says Manskow. Getting hold of correct, up-to-date information often requires extra resources.

Patient safety at risk

GPs, nurses and pharmacists describe critical challenges that can endanger patient safety:

piecemeal information, increased risk of incorrect medication, uncertainty, dependence on others, and unnecessary use of time.

Challenges greatest for nurses

The challenges are greatest for nurses who work in the home care service or in short-term wards in nursing homes. In such wards, there is a large turnover of patients and many different doctors to relate to. The nurses spend a lot of time, were uncertain and dependent on others for information.

Nursing home doctors also have major challenges with time use and dependence on others for information. Several called it "detective work". Pharmacists do not even have access to core medical records or other systems in the local health authority. Nor do



*Senior Researcher
Unn Sollid Manskow*



*Researcher
Truls Tunby Kristiansen*



they have digital communication with GPs. GPs have their own, satisfactory IT systems. They nevertheless spend a lot of time updating, securing and disseminating information.

Incomplete epicrisis from hospitals is a challenge for all groups. When a patient is discharged from hospital or transferred within the health services, the risk of serious incorrect medication is particularly great.

Great expectations

'The municipalities that took part in the study were extremely welcoming and positive. They

willingly contributed information. Those who were interviewed showed great interest both in the issue and in the research we're doing. Everyone is impatient and looking forward to the introduction of the Patient's medication list,' says Truls Tunby Kristiansen. They expect better use of time and resources, and better division of responsibilities, information flow and collaboration. They regard PLL as a long-awaited solution to widely acknowledged, widespread problems.

'We will pass on the experiences and results from further studies to those responsible for the introduction,' says Unn Sollid Manskow.



Reference:

Unn Sollid Manskow og Truls Tunby Kristiansen: Challenges Faced by Health Professionals in Obtaining Correct Medication Information in the Absence of a Shared Digital Medication List. *Pharmacy*, 2021, 9, 46. [Doi.org/10.3390/pharmacy9010046](https://doi.org/10.3390/pharmacy9010046)

How can misinformation about covid-19 be stopped?

Large amounts of fake news are spread about the coronavirus, infection and disease. Is it actually possible to stop such misinformation?

In the spring of 2020, researcher Elia Gabarron and her colleagues decided to investigate what was happening on Twitter, Facebook and other social media. At the same time as the coronavirus spread to country after country, more and more misinformation about covid-19 appeared on digital platforms.

'At the beginning of the pandemic, there was a lot of uncertainty that led to online speculation. What kind of virus was this and how did people get infected? Many health services lacked protective equipment, and no one knew when we could get vaccines,' says Gabarron, who is a senior researcher at the Norwegian Centre for E-health Research.

Rapid spread of information

Dictionary publisher Merriam-Webster describes an infodemic as a mixture of the words information and epidemic. It refers to the rapid spread of both true and false information about something, such as a pandemic. The World Health Organisation has been using the term infodemic for some time and has its own website about it. The organisation believes that sharing incorrect information can be just as harmful as the disease in a larger societal context. Gabarron agrees:

'The consequences may include weakened trust in the authorities and health services and riskier behaviours that contribute to increased spread of infection.'

Analysed 22 articles

In May and June 2020, Gabarron and her colleagues searched for scientific articles that addressed misinformation about covid-19 on

social media. She was surprised to find so much had been published, only shortly after the outbreak of the pandemic.

'The first search gave us over 800 hits on scientific studies on the subject. We finally ended up with far fewer studies since many did not meet our inclusion criteria. Still, I'm impressed that so many researchers were so quickly on the ball to investigate this. Most people did not have the funding to write the articles, but did so in their spare time.'

In the end, they included 22 studies in the systematic review. In eleven of them, the covid-19 disinformation was not categorised. Nine of the studies described misinformation myths, while sarcasm and humour were topics in two articles. The researchers had obtained data from social media such as Twitter, Facebook, WhatsApp and YouTube.

Anxiety and misuse of resources

Only four of the 22 studies examined possible consequences of misinformation. 'Everyone reported that wrong information about the corona could lead to fear,' Gabarron says.

One in four studies pointed out that incorrect information could lead to inappropriate use of resources in the health sector and that health personnel became more stressed. In one of the articles, almost half of the interviewees answered that they were fed up with corona dominating the news picture.

The researchers found it difficult to categorise the findings. How can one state with certainty that a person has shared misinformation on purpose to mislead or harm, or that they are unaware that they are spreading untruths or propaganda?



Senior Researcher
Elia Gabarron



Can we stop misinformation?

In most studies, the researchers put forward suggestions as to how to put a brake on misleading information about covid-19. The advice can be summed up as follows:

- Present correct, reliable information.
- Counteract or reject incorrect information.
- Increase health competence among the general public.
- Take personal responsibility for everything you share.
- Social media should be supervised and have better guidelines.
- More research.
- Active presence on social media.

Unlike just a few years ago, false information now reaches very many people in a short space of time. Therefore, it is important that health organisations are actively present

in social media to promote advice and knowledge.

‘The health services probably started a little late in establishing good information sharing on social media when the corona pandemic broke out. Too little quality-assured information came out. What we have learned is that organisations should have both strategies and personnel ready before things start happening,’ says Gabarron.

She says that anxiety about the disease and infection has now tipped over into a concern about the various vaccines.

‘For the next generation, one can imagine it being a good idea to get the knowledge into schools. Information evaluation, “netiquette” and fake news are already topics in education. You could certainly build on that to encourage better health competence,’ says Elia Gabarron.

Reference:

Elia Gabarron mfl.: COVID-19-related misinformation on social media: a systematic review. Bulletin of the World Health Organization. Systematic reviews, 2021. DOI: [dx.doi.org/10.2471/BLT.20.276782](https://doi.org/10.2471/BLT.20.276782)

Artificial intelligence can help diabetic patients exercise safely

Researchers are using artificial intelligence to calculate how a patient with type 1 diabetes can safely navigate a workout. Now they are looking forward to developing a mobile app and testing it on patients.

‘Patients with type 1 diabetes get great health benefits from exercise, but keeping control of their blood sugar levels during exercise can be challenging. We hope artificial intelligence can help make life with this disease a little easier.’

So says Phuong Dinh Ngo, a senior researcher at the Department of Health Data Analytics at the Norwegian Centre for E-health Research. He and other researchers have used artificial intelligence to predict drops in blood sugar levels and the need for food intake in connection with physical activity.

Remove the obstacles

Patients with type 1 diabetes have a body that does not produce insulin. They need to inject artificial insulin to keep their blood sugar levels stable during exercise and meals.

What and how much to eat before exercise is difficult to discover without resorting to trial and error. Thus it becomes necessary to expose oneself to a certain risk when testing how one's blood sugar level develops during a training session. This obstacle makes taking up exercise particularly difficult.

‘Too low a blood sugar level – hypoglycemia – is serious, and the patient may fall into a coma or die as a result. It is important to put tools in place that can make it less risky to exercise,’ says Ngo.

Uses artificial neural networks

‘Our goal is to create a safe app that gives the diabetic patient a personal recommendation for what and how much he or she should eat when exercising. The challenge is that you cannot give a person advice on the basis of data from the population at large. People can have very different metabolisms. That's why it has to be personalised,’ says Ngo.



Senior Researcher
Phuong Dinh Ngo



Senior Researcher
Maryam Tayefi Nasrabadi

Liv Bollvåg, Head of Research, DIPS

What was the best thing about 2021?

2021 was the year we prepared to get good solutions to the health service faster.

The “Open DIPS” initiative made it possible for other bodies to create apps that become available in DIPS. We have put together a sandbox and an excellent team. The focus

is on end users and their need for comprehensive solutions, without unnecessary system changes or duplication of work.

We look forward to more innovation being released, both from research communities and from large and small e-health actors.

We'll be continuing to develop a more complete virtual hospital – where we can create the solutions of the future together!





The app must be able to provide accurate, safe advice. Simulations created by the researchers indicate that they will be able to calculate the correct food intake with the help of patient-generated data and specific information from the users.

The researchers have used virtual patients to simulate the amount and type of food that should be eaten before a workout on a treadmill. Artificial neural networks are then developed to calculate future blood sugar levels and risks associated with exercise. The methods used also capture the uncertainty in the results. The researchers are sure that what the computer gradually learns about activity levels and blood sugar response will result in a safer calculation than simply allowing the patient to experiment.

The results have also provided researchers with a direction for the future development

of methods for AI use. The goal is effective methods which minimise risk for patients.

Recruiting volunteers

'In the near future, we'll be looking to recruit between five and ten volunteers with type 1 diabetes who can test our algorithm and study what happens when they follow the recommendations in the future mobile app. This testing will of course take place in compliance with approved safety protocols,' emphasises senior researcher Maryam Tayefi.

In the training app being developed, each user must feed the app with blood sugar level, food intake and training amount over a short period before the recommendations can be precise.

Should the research lead to the development of a saleable product, the researchers assume that it will take between three and four years before such an app can be available on the market.

Reference:

Puong Ngo mfl.: Risk-Averse Food Recommendation Using Bayesian Feedforward Neural Networks for Patients with Type 1 Diabetes Doing Physical Activities. Applied Sciences, 2020. Doi.org/10.3390/app10228037

Bodø wants to be the best place to grow up in the country. They are listening to children and young people who need welfare technology

How can apps and various forms of welfare technology provide the best possible benefit for children and young people with disabilities? Researchers recommend starting with the child's needs.

If welfare technology is to work well in use, it must be organised as part of a comprehensive offer. The municipality of Bodø has managed to do it. They dealt with three perspectives simultaneously:

- The most important: The user's needs.
- Facilitating operation by means of adequate training.
- Incorporation in municipal service provision.

'That's why Bodø's results are so good and very useful to learn from,' says Marianne V. Trondsen, senior researcher at the Norwegian Centre for E-health Research.

She is supported in this by research colleagues senior adviser Undine Knarvik and research fellow Gunn Hilde Rotvold.

Solutions for children and young people

Welfare technology, ranging from specialised technological installations to ordinary mobile apps, can be of great benefit to children and young people with disabilities.

The triumvirate have been researching the testing of technology for children and young people with disabilities in five municipalities in Norway since 2016. The goal has been to try out technology that can make it easier for the target group to participate in and master leisure activities.

Organisation is key

Specially adapted technology makes it easier for many children and young people to communicate with friends, via voice control and automatic reading of text messages and the like.

However, the technological aid in itself is not always enough. 'Much of the research internationally has concentrated on user experiences with a single product. There's not very much about what it takes in terms of organisation to be able to start using and succeed with welfare technology aids. In Bodø, this is what we have been studying in particular,' says Rotvold.

Enthusiasts are not enough

They found that if the organisation of welfare aids rests on a single enthusiast, for example a teacher, then there is a great risk that the use of the technology will not be continued when new staff, new services and networks around the child come in.

Bodø's method

So what has Bodø done? The researchers found the following:

Focus on the user:

Mapping the user's needs and resources facilitated choice of the correct welfare technology. The child received two different aids at school and at home. One to help with what time it is and one to help the child remember things. The technology allowed the child to become more independent.

Facilitation:

The welfare technology aids were organised in a service that facilitated around-the-clock use



Senior Researcher
Marianne Trondsen



Senior Adviser
Undine Knarvik



PhD Candidate
Gunn Hilde Rotvold



and in all arenas where the child participated. The occupational therapy and physiotherapy service led the work, acted as both provider and facilitator, and developed a service model with routines for mapping, training, follow-up, collaboration and evaluation.

Incorporation:

Bodø's vision is to be "the best place to grow up in the country". The project gave content to the digitalisation strategy, and the heads of the Children and Family Unit and the Occupational Therapy and Physiotherapy Service were positive facilitators of the resources and processes that were necessary.

According to the researchers, the introduction of welfare technology was characterised by commitment and motivation from the parties concerned.

Collective commitment necessary

'Bodø's service model takes the weight off individuals, permits incorporation at all levels and integrates the use of welfare technology

as part of the service. This may also create collective commitment,' says Knarvik.

'Then we must recognise that welfare technology requires knowledge, resources and staffing. Beyond that, the right training and the motivation to use it are crucial. Not only from the person who will benefit from the aid, but with the family, professionals and everyone else who otherwise contributes,' she says.

Requires time and resources

The researchers believe that welfare technology has a great potential for children and young people with disabilities, when the correct framework is in place.

'The local authorities must ensure that all professional bodies are included and prepared to meet a new practice. Good arenas for cooperation must be created with mutual understanding of each other's professional perspectives, their working day and available resources. In addition, good collaboration with parents is crucial,' says Trondsen.

Reference:

Undine Knarvik mfl.: «Hele døgnet, hele uka, hele livsløpet»: Velferdsteknologi som del av et helhetlig tilbud for barn og unge med funksjonsnedsettelse. En kvalitativ studie i Bodø kommune. Rapport, Nasjonalt senter for e-helseforskning, 2020.

Undine Knarvik mfl.: Internasjonal litteraturstudie om velferdsteknologi for barn og unge med funksjonsnedsettelse. Kunnskapsoppsummering, Nasjonalt senter for e-helseforskning, 2020.

Therapists found transition from physical to digital therapy abrupt, but good

When the country went into partial lockdown in March 2020, Blue Cross 'Kompasset' immediately offered digital follow-up to young users from homes affected by alcohol and drug problems.

Shame, stigma and secrecy associated with parents' substance abuse problems can make it difficult to seek help. There are few low-threshold services available where children and young people can contact for advice, help and support. For them, talking to someone who understands can be vital. When physical therapy is not an option, digital call services can be a great way to reach those who are struggling.

Researching the experiences of users and therapists

In 2019, Kompasset started offering digital conversation therapy. Shortly before the corona outbreak, the Norwegian Centre for E-health Research started a three-year study of the service. The purpose of the study is to gain knowledge about whether and how online conversation therapy under the auspices of the Blue Cross Kompasset can function as a good therapeutic offer and coping tool for young people who have parents with substance abuse problems.

The study was to explore both users' and therapists' experiences with online conversation therapy.

Abrupt but successful transition

Researchers Marianne V. Trondsen and Unn Sollid Manskow at the Norwegian Centre for E-health Research have recently published an article in the Journal of Mental Health Work where findings from the first sub-study

are presented. Based on focus groups with Kompasset's six department heads, the researchers in their article explore their experiences with the sudden transition from therapy in the departments to video-based conversation therapy with the users.

In brief, the findings show that the department heads found the transition rather abrupt but that it generally went well.

Worked well in the state of emergency

Using a video-based tool, Kompasset was able to maintain an accessible low-threshold service for young people with parents with substance abuse problems during the national state of emergency. The study has also provided knowledge about how the changed framework conditions brought about both opportunities and challenges.

Doing the same in a new way

All six department heads who participated in the study, have a background in psychology, special psychology or family therapy. They have managerial responsibilities for one to five employees and work both as a manager and therapist in their daily work. The department heads agree that the transition to online therapy has been surprisingly quick and easy. The digital offer has functioned both as a safety net and anchor point for users during an unpredictable period.

The way forward

The findings provide knowledge about how digital conversation services for young people can be designed when physical meetings are not possible. The next sub-studies will address



Senior Researcher
Marianne Trondsen



Senior Researcher
Unn Sollid Manskow



the users' experiences with online therapy, as well as take a closer look at the individual therapists' experiences with such a digital service.

'We hope that what we learn from the research project will be used to develop the

service further to the benefit of the users of Kompasset. Findings from the study can also contribute to further knowledge development in relation to the use of video-based conversation therapy for help and follow-up in mental health work,' says researcher Unn Sollid Manskow.

Reference:

Marianne V. Trondsen og Unn S. Manskow: Å være terapeut i en unntakstilstand: samtalerapi på nett under koronapandemien til unge som har foreldre med rusproblemer. Tidsskrift for Psykisk Helsearbeid, 2021. (Sammendrag) Doi.org/10.18261/issn.1504-3010-2021-02-03



Karl Øyvind Mikalsen, Head of SPKI and Associate Professor, UiT Norway's Arctic University

What was the best thing about 2021?

It was particularly good that North Norway RHA came up with a strategy for using artificial intelligence and that the Norwegian Centre for Clinical Artificial Intelligence was established and opened.

The centre focuses on testing, innovation and implementation of clinical decision support

tools, for the benefit of both patients and clinicians. The centre is a bridge-builder between the research and clinical communities when it comes to new machine-learning methods for analysis and information retrieval from complex patient data.

It is precisely this close organisational connection between professionals in technology and medicine, combined with access to, and use of, updated patient data that the development of quality-assured, effective and secure AI solutions possible.

During the pandemic: Patients happy to receive sick leave without physical attendance

As many as 36 % of all sick leave was given by GPs via video, telephone or text. Most patients felt this to be faster, easier and without the risk of infection.

The corona pandemic brought about a temporary change in the law that allowed GPs to issue sick notes to patients by e-consultation, without the necessity of a physical meeting. The Norwegian Centre for E-health Research was commissioned by the Ministry of Labour and Social Affairs to investigate experiences and consequences of sick leave through e-consultation.

A survey was conducted among patients and GPs in the autumn of 2020. Researchers conducted in-depth interviews with GPs and extracted data on sick leave from the registers of HELFO and NAV. The report shows that 36 % of all sick notes in the relevant period were given after e-consultation. This includes communication via video-link, telephone or text. Patients who received a sick note via e-consultation with the doctor were generally satisfied with the service.

Over 70% were very satisfied or fairly satisfied with receiving a sick note without physical attendance. 86% thought it equally easy or easier to explain the problem to the doctor digitally.

Satisfied patients and GPs

The results showed that patients and GPs arrived at fairly similar assessment in relation to the advantages and disadvantages of sick leave by e-consultation.

'Both parties enjoyed the efficiency and flexibility of communicating digitally. At the same time, some GPs and patients were concerned about whether the clinical assessments were

correct and whether the relationship between patient and doctor could be weakened by not meeting physically.' So says Head of Project Eli Kristiansen at the Norwegian Centre for E-health Research.

Doctors who were concerned about misjudging clinical information said they could provide sick notes for a shorter period and then call the patient in again to meet face-to-face.

'If the law allows sick notes to be issued via e-consultation in the future, the service should be regulated to ensure that sick leave is appropriate,' says Kristiansen.

According to the report, a GP should be able to extend sick leave by e-consultation when the patient's health problem and situation are known from before. If the GP is familiar with both the patient and the patient's previous sick-leave history, he/she should be able to issue sick notes on the basis of e-consultation. New sick notes given for recently occurring health problems should not, in principle, be issued via e-consultation.

60% of patients would do it again

The survey also showed that four out of five patients thought the doctor would not have received more information about their state of health if they had visited the doctor's surgery. Around 60% of the patients said that they wanted to see the doctor digitally next time as well if they had the same health problem.

'Patients pointed out several benefits of receiving a sick note following digital consultation: It was quicker, easier and removed the risk of infection they could otherwise have been exposed to,' she says. The researchers say that the results of the study must be read



*Senior Adviser and
PhD Candidate
Eli Kristiansen*

From left:
Eli Kristiansen, Paolo
Zanaboni and Monika
Johansen at the Norwe-
gian Centre for E-health
Research.
Photo: Lene Lundberg



in light of the special pandemic situation and the requirement for infection control. One cannot simply transfer the results to a normal situation.

'If we get a permanent change in the law that allows sick leave by e-consultation, it will be useful to carry out a new study to find out what will happen in a normal situation,' says Eli Kristiansen.

Reference:

Eli Kristiansen mfl.: E-konsultasjon og sykmelding. Rapport fra Nasjonalt senter for e-helse-forskning, 2021.



Ellen Rønning-Arnesen, State Secretary

What was the best thing about 2021?

The vision for the e-health field is the same as for the rest of our shared health service: to create a health-promoting society, prevent disease and ensure a decentralized health service that provides good health services for all throughout the country. We shall combat increased social and geographical differences and a division of the health service. Thus we must ensure that citizens meet seamless services based on their needs and resources.

What is important to you is a fundamental question.

Digitalisation must be a tool and digital competence must be a core competence in the

health and care service too. We must create good conditions for sharing and reusing data in a secure way. Then we will be making good use of the community's resources and contributing to a more sustainable health service.

Our health service must be a learning service, which dares to try out new solutions as they are developed. Then we need to be a good team. We must ensure there is a good framework and a good climate of cooperation. Then we must always make sure that it is the patient's best interests that provide the basis for what we do.

Many solutions exist already. It is our job to ensure that we make use of them and reap the benefits for professionals, patients and the community.

Greater self-reliance, security and freedom through the use of welfare technology

Does increased use of welfare technology in the health sector lead to increased patient security and safety, and does it strengthen the individual's ability to look after themselves in everyday life? Can such technology also function as technological support for relatives and help to improve accessibility, resource utilisation and quality of service provision?

The Norwegian Centre for E-health Research has sought to provide answers to these questions in a review of international research literature that describes the effects of safety and self-reliance technology for elderly people living at home and nursing-home residents.

Greater self-reliance, security and freedom

Irrespective of the technology, studies show that users experience greater self-reliance, security and freedom when using such welfare technology. The summary of knowledge also shows that some of technologies also contribute to increased mobility for users.

‘Service recipients and their relatives share a strong desire for being able to live at home for as long as possible. Technology that provides a feeling of security and safety in the home is therefore greatly appreciated,’ says senior adviser Elin Breivik in the Department of Personal E-health at the Norwegian Centre for E-health Research.

By security and self-reliance technology we mean location technology (GPS), electronic medication support, electronic door locks, digital surveillance, digital security alarms and response services. These solutions are included in the Norwegian Directorate of Health's recommendation to local authorities participating in the National Welfare Technology Program.

Opposition between security and freedom

Some studies refer to users who believe the technology results in less freedom and their being tied to their home. Users' uncertainty as to whether the technology will work when needed can also lead to increased insecurity. Security and freedom can be opposites, but several studies report that many users think security weighs heaviest, so that they can still live at home.

‘Security and self-reliance technology sometimes present challenges. Thorough mapping of users' needs must form the basis for using the technology. The fact that users are able to operate the technology is also crucial for perceived security and self-reliance,’ says PhD candidate Gunn-Hilde Rotvold in the Department of Personal E-health at the Norwegian Centre for E-health Research.

There are reports of increased freedom and less worries for relatives of the users, but also of more responsibility and increased workload.



Senior Adviser
Elin Breivik



PhD Candidate
Gunn Hilde Rotvold



Knowledge gap

The studies also reveal that the good results depend on several factors: What needs the technology is to meet, which technologies are used, who is affected by the use of technology and in what context the technology is to be used?

This review of literature related to the effects of security and self-reliance technology reveals

a knowledge gap. Qualitative effects for users and relatives are well documented, but the studies reveal little quantitative effects, such as saved time or avoided costs. A few studies include how the use of safety and self-reliance technology affects work practice, but other effects for health professionals have not been investigated. None of the studies have examined the effects on the health and care services.

Reference:

Breivik, Elin; Rotvold, Gunn Hilde; Michalsen, Kamilla; Steen Lindseth, Lene; Bjørvig, Siri. Kunnskapsoppsummering om effekter av trygghets- og mestringsteknologi. Tromsø: Nasjonalt senter for e-helseforskning 2021 (ISBN 978-82-8242-102-7) 21 s. NSE-rapport (02-2021)

In 50% of cases, a video meeting with the GP was as good as an appointment at the doctor's

But not all GPs want to continue with video after the pandemic is over. Two factors in particular make video equally suitable as a face-to-face doctor's appointment.

When the pandemic became fully established in Norway in spring 2020, GPs drastically increased their use of video consultations. In April 2020, GPs were asked to evaluate one or more video consultations they were going to undertake. Now the results have been published in the Journal of Medical Internet Research (JMIR). Given the same problem, half of the doctors believed that the video consultations were better than or equal to a normal face-to-face consultation.

Tor Magne Johnsen and Børge Lønnebakke Norberg are the primary authors of the study. Both are GPs in Trondheim, university lecturers at NTNU and have part-time positions at the Norwegian Centre for E-health Research.

Previously known

Two factors in particular were crucial for beneficial video consultation: Knowledge of the patient and the particular problem. In about half of the video consultations, the patient was very well known to the GP. In 57% of such cases, doctors believed that video was at least as suitable as a regular consultation.

With less knowledge of the patient, video was seen as an equally good alternative in 38% of cases and for even fewer when the patient was completely unknown. When a problem was new, moreover, the GPs thought that video was far less suitable.

Worried about overlooking something

15% of doctors were afraid of overlooking signs of serious illness.

'We found that many patients contacted us with issues that should normally have been dealt with in physical consultations at the doctor's surgery. It's possible they did not always understand how serious their condition was, and perhaps the fear of infection was so great that they chose to stay at home anyway. Bearing this in mind, it was not so surprising that many video consultations resulted in a physical meeting being set up for the next occasion.

More composite topics, chronic pain, sleeping problems and fatigue were issues where video was considered a good alternative. The same applied to cancer monitoring.

Important conditions

Eli Kristiansen is a co-author of the study and Ph.D candidate at the Norwegian Centre for E-health Research. 'It is important to investigate whether the clinical assessments made in a video consultation are as good as in a consultation at the doctor's office, and we need the doctors' own assessments of when video is suitable. We see that the use of video-consultation has stabilised at a lower level today than in the spring, so we were fortunate to be able to collect such a large amount of data material while use was at its highest,' she says.



*Researcher
Tor Magne Johnsen*



*Researcher Børge
Lønnebakke Norberg*



*Senior Adviser and
PhD Candidate
Eli Kristiansen*



One in two motivated

Almost half of the GPs answered “yes” to the question of whether they were motivated to carry out video consultations on similar issues even after the pandemic. Almost three out of ten answered “no”. The doctors estimated that they would carry out about 20% of consultations on video after the pandemic.

Reference:

Tor Magne Johnsen mfl: Suitability of Video Consultations During the COVID-19 Pandemic Lockdown: Cross-sectional Survey Among Norwegian General Practitioners. J Med Internet Res., 2021. DOI: 10.2196/26433

Appendices

Journal publications

Larbi, Dillys; Randine, Pietro; Årsand, Eirik; Bradway, Meghan; Antypas, Konstantinos; Gabarron, Elia.

Criteria for Assessing and Recommending Digital Diabetes Tools: A Delphi Study. *Studies in Health Technology and Informatics* 2021 ;Volum 281. s.850-854 UNN SINTEF UiT

Barzegar-Amini, Maral; Khorramruz, Fateme; Ghazizadeh, Hamideh; Sahebi, Reza; Mohammadi-Bajgiran, Maryam; Ardabili, Hossein Mohaddes; Tayefi, Maryam; Darroudi, Susan; Moohebati, Mohsen; Heidari-Bakavoli, Alireza; Mohammadi, Akram; Sadeghnia, Hamid Reza; Ferns, Gordon A.; Hoseini, Seyed Javad; Ghayour-Mobarhan, Majid.

Association between serum Vitamin E concentrations and the presence of Metabolic Syndrome: A population-based cohort study. *Acta Biomedica* 2021 ;Volum 92.(3) UNN

Blanco, Alberto; Remmer, Sonja; Perez, Alicia; Dalianis, Hercules; Casillas, Arantza.

On the Contribution of Per-ICD Attention Mechanisms to Classify Health Records in Languages With Fewer Resources than English. *International conference: Recent Advances in Natural Language Processing (RANLP)* 2021 s.170-177 UNN

Bradway, Meghan; Woldaregay, Ashenafi Zebene; Issom, David-Zacharie; Pfuhl, Gerit; Hartvigsen, Gunnar; Årsand, Eirik; Henriksen, André.

mHealth: Where Is the Potential for Aiding Informal Caregivers?. *Studies in Health Technology and Informatics* 2021
UiT UNN

Bradway, Meghan; Årsand, Eirik.

Exploring Real-World mHealth Use for Diabetes Consultations: Pros and Pitfalls of a Pragmatic Mixed-Methods Approach. *Studies in Health Technology and Informatics* 2021 ;Volum 281. s.875-879 UNN UiT

Budrionis, Andrius; Miara, Magda; Miara, Piotr; Wilk, Szymon; Bellika, Johan Gustav.

Benchmarking PySyft Federated Learning Framework on MIMIC-III Dataset. *IEEE Access* 2021
UNN

Chandler, Chelsea; Holmlund, Terje Bektesevic; Foltz, Peter W.; Cohen, Alex S.; Elvevåg, Brita.

Extending the usefulness of the verbal memory test: The promise of machine learning. *Psychiatry Research* 2021 ;Volum 297:113743.
s.1-7 UiT UNN

Cohen, Alex S.; Cox, Christopher R.; Tucker, Raymond P.; Mitchell, Kyle R.; Schwartz, Elana K.; Le, Thanh P.; Foltz, Peter W.; Holmlund, Terje Bektesevic; Elvevåg, Brita.

Validating Biobehavioral Technologies for Use in Clinical Psychiatry. *Frontiers in Psychiatry* 2021 ;Volum 12. s.1-12
UiT UNN

Cox, Narelle S.; McDonald, Christine F.; Mahal, Ajay; Alison, Jennifer A.; Wootton, Richard; Hill, Catherine J.; Zanaboni, Paolo; O'Halloran, Paul; Bondarenko, Janet; Macdonald, Heather; Barker, K; Crute, Hayley; Mellerick, Christie; Wageck, Bruna; Boursinos, Helen; Lahham, Aroub; Nichols, Amanda; Czupryn, Pawel; Corbett, M; Handley, E; Burge, Angela T.; Holland, Anne E.

Telerehabilitation for chronic respiratory disease: A randomised controlled equivalence trial. *Thorax* 2021
UiT UNN

Denecke, Kerstin; Gabarron, Elia.

How Artificial Intelligence for Healthcare Look Like in the Future?. *Studies in Health Technology and Informatics* 2021 ;Volum 281.
s.860-864 UNN

Dyb, Kari; Berntsen, Gro; Kvam, Lisbeth.

Adopt, adapt, or abandon technologysupported person-centred care initiatives: healthcare providers' beliefs matter. *BMC Health Services Research* 2021 ;Volum 21.
NTNU UNN

Fagerlund, Asbjørn Johansen; Kristiansen, Eli; Johansen, Monika Alise; Haumann, Kathrine; Zanaboni, Paolo.
Elektronisk innsyn i journal for pasienter i psykisk helsevern: Helsepersonells erfaringer. *Tidsskrift for Norsk Psykologforening* 2021 ;Volum 58.(5) s.380-389 UNN

Fernandez Luque, Luis; Kushniruk, A.W.; Georgiou, A; Basu, A.; Petersen, Carolyn; Ronquillo, C.; Paton, Chris; Nøhr, Christian; Kuziemsky, Craig E.; Alhuwail, D.; Skiba, Diane; Huesing, E.; Gabarron, Elia; Borycki, E.M; Magrabi, Farah; Denecke, Kerstin; Peute, Linda W.; Topaz, Maxim; Al-Shorbaji, Najeeb M.; Lacroix, Pascal; Marcilly, Romaric; Cornet, Ronald; Gogia, S.B.; Kobayashi, S.; Iyengar, S.; Deserno, T.M.; Mettler, Tobias; Vimarlund, Vivian; Zhu, X.
Evidence-Based Health Informatics as the Foundation for the COVID-19 Response: A Joint Call for Action. *Methods of Information in Medicine* 2021 UNN

Gabarron, Elia; Larbi, Dillys; Årsand, Eirik; Wynn, Rolf.
Engaging Social Media Users with Health Education and Physical Activity Promotion. *Studies in Health Technology and Informatics* 2021 ;Volum 281. s.789-793
UNN UiT

Gabarron, Elia; Rivera-Romero, Octavio; Miron-Shatz, Talya; Grainger, Rebecca; Denecke, Kerstin.
Role of Participatory Health Informatics in Detecting and Managing Pandemics: Literature Review. *Yearbook of Medical Informatics* 2021 ;Volum 30.(1) s.200-209 UNN

Gabarron Hortal, Elia Dolores; Oyeyemi, Sunday Oluwafemi; Wynn, Rolf.
Covid-19-related misinformation on social media: a systematic review. *Bulletin of the World Health Organization* 2021 ;Volum 99.(6) s.455-463A UNN UiT

Giunti, Guido; Claes, Mäelick; Zubiete, Enrique Dorronzoro; Rivera-Romero, Octavio; Gabarron, Elia.
Impact of COVID-19 on Multiple Sclerosis Topic Discussion on Twitter. *Studies in Health Technology and Informatics* 2021 ;Volum 281. s.865-869 UNN

Giunti, Guido; Isomursu, Minna; Gabarron, Elia; Solad, Yauheni.
Designing Depression Screening Chatbots. *Studies in Health Technology and Informatics* 2021 ;Volum 284. s.259-263
UNN

Goodall, Gemma; André, Lara; Taraldsen, Kristin; Serrano, J Artur.
Supporting identity and relationships amongst people with dementia through the use of technology: a qualitative interview study. *International Journal of Qualitative Studies on Health and Well-being* 2021 ;Volum 16.(1) s.1-26
NTNU UNN

Gullstett, Monika Knudsen; Kristiansen, Eli; Nilsen, Etty Ragnhild.
Therapists' experience of video consultation in specialized mental health services during the COVID-19 pandemic: Qualitative interview study. *JMIR Human Factors* 2021 ;Volum 8.(3) s.1-12
UNN UiT

Hansen, Anne Helen; Wangberg, Silje C.; Årsand, Eirik.
Lifestyle changes among people with type 2 diabetes are associated with participation in online groups and time since diagnosis. *BMC Health Services Research* 2021 ;Volum 21.(1) s.1-9
UiT UNN

Hansen, Elisabeth Holm; Sandvik, Berit Margrethe; Teige, Anne-May; Antypas, Konstantinos; Guttormsen, Linn Stokke; Næss, Kari-Anne Bottegård.
Tidlig identifisering av barn som stammer- en spørreundersøkelse av helsesykepleieres vurderinger. *Sykepleien Forskning* 2021 ;Volum 16. s.1-21 SINTEF USN UiO UNN

Ismail, Leila; Materwala, Huned; Tayefi, Maryam; Ngo, Phuong; Karduck, Achim P..
Type 2 Diabetes with Artificial Intelligence Machine Learning: Methods and Evaluation. *Archives of Computational Methods in Engineering* 2021 UNN

Johnsen, Tor Magne; Norberg, Børge Lønnebakke; Kristiansen, Eli; Zanaboni, Paolo; Austad, Bjarne; Helgetun Krogh, Frode; Getz, Linn Okkenhaug.
Suitability of Video Consultations During the COVID-19 Pandemic Lockdown: Cross-sectional Survey Among Norwegian General Practitioners. *Journal of Medical Internet Research* 2021 ;Volum 23.(2) Suppl. e26433.
UNN NTNU UiT

Jøsendal, Anette Vik; Bergmo, Trine Strand.

From Paper to E-Prescribing of Multidose Drug Dispensing: A Qualitative Study of Workflow in a Community Care Setting. *Pharmacy* 2021 ;Volum 9.(1) s.1-12 UiT UNN UiO

Jøsendal, Anette Vik; Bergmo, Trine Strand; Granås, Anne Gerd.

Implementation of a shared medication list in primary care - a controlled pre-post study of medication discrepancies. *BMC Health Services Research* 2021 ;Volum 21:1315. s.1-9

UiO UNN UiT

Jøsendal, Anette Vik; Bergmo, Trine Strand; Granås, Anne Gerd.

The Practice Guidelines for Multidose Drug Dispensing Need Revision—An Investigation of Prescription Problems and Interventions. *Pharmacy* 2021 ;Volum 9.(1)

UiO UiT UNN

Larbi, Dillys; Gabarron, Elia; Denecke, Kerstin.

Social media chatbot for increasing physical activity: usability study. *Studies in Health Technology and Informatics* 2021 ;Volum 285. s.227-232

HIOF UNN

Le, Thanh P.; Moscardini, Emma; Cowan, Tovah; Elvevåg, Brita; Holmlund, Terje Bektesevic; Foltz, Peter W.; Tucker, Raymond P.; Schwartz, Elana K.; Cohen, Alex S..

Predicting self-injurious thoughts in daily life using ambulatory assessment of state cognition. *Journal of Psychiatric Research* 2021 ;Volum 138. s.335-341 UiT UNN

Malaguti, Carla; Holland, Anne E.; McDonald, Christine F.; Mahal, Ajay; Alison, Jennifer A.; Hill, Catherine J.; Zanaboni, Paolo; O'Halloran, Paul; Bondarenko, Janet; Macdonald, Heather; Barker, Kathryn; Crute, Hayley; Mellerick, Christie; Wageck, Bruna; Boursinos, Helen; Lahham, Aroub; Nichols, Amanda; Czupryn, Pawel; Burge, Angela T.; Cox, Narelle S..

Community Participation by People with Chronic Obstructive Pulmonary Disease. *COPD: Journal of Chronic Obstructive Pulmonary Disease* 2021

UNN UiT

Manskow, Unn Sollid; Kristiansen, Truls Tunby.

Challenges Faced by Health Professionals in Obtaining Correct Medication Information in the Absence of a Shared Digital Medication List. *Pharmacy* 2021 ;Volum 9.(46)

UNN

Moen, Anne; Chronaki, Catherine; Petelos, Elena; Voulgaraki, Despina; Turk, Eva; Névéol, Aurélie.

Diversity in Health Informatics: Mentoring and Leadership. *Studies in Health Technology and Informatics* 2021 ;Volum 281. s.1031-1035

UNN UiO

Mulac, Alma; Hagesæther, Ellen; Granås, Anne Gerd.

Medication dose calculation errors and other numeracy mishaps in hospitals: Analysis of the nature and enablers of incident reports. *Journal of Advanced Nursing* 2021 ;Volum 78.(1) s.224-238

UiO OSLOMET UNN

Nost, Torunn Hatlen; Woodhouse, Astrid; Dale, Lars-Oskar; Hara, Karen Walseth; Steinsbekk, Aslak.

Participants' experiences from group-based treatment at multidisciplinary pain centres-a qualitative study. *Scandinavian Journal of Pain* 2021 s.1-9 NTNU STO UNN

Nøst, Torunn Hatlen; Faxvaag, Arild; Steinsbekk, Aslak.

Participants' views and experiences from setting up a shared patient portal for primary and specialist health services- a qualitative study. *BMC Health Services Research* 2021 ;Volum 21.

STO NTNU

Pektas, Omer; Koseoglu, M; Muzny, Miroslav; Hartvigsen, Gunnar; Årsand, Eirik.

Design of an Android Wear Smartwatch Application as a Wearable Interface to the Diabetes Diary Application. *Academic Platform Journal of Engineering and Science – APJES* 2021 ;Volum 9.(1) s.126-133

UNN UiT

Pettersen, Mona Skjeklesæther; Moen, Anne; Børøund, Elin; Wilberg, Theresa.

Therapists' experiences with mentalization-based treatment for avoidant personality disorder. *European Journal for Qualitative Research in Psychotherapy (EJQRP)* 2021 ;Volum 11. s.143-159

OUS UiO UNN

Remmer, Sonja; Lamproudis, Anastasios; Dalianis, Hercules.

Multi-label Diagnosis Classification of Swedish Discharge Summaries – ICD-10 Code Assignment Using KB-BERT. *International conference: Recent Advances in Natural Language Processing (RANLP)* 2021 s.1162-1170

UNN

Saberi-Karimian, Maryam; Ghazizadeh, Hamideh; Kabirian, Marzieh; Barati, Elham; Andalibi, Mohammad Sobhan Sheikh; Khakpour, Smaneh; Safari, Mina; Baghshani, Mohammad Reza; Parizadeh, Seyed Mostafa; Tayefi, Maryam; Ferns, Gordon A.; Ghayour-Mobarhan, Majid.

Association of healthy eating index and the alternative healthy eating index with the cell blood count indices. *Acta Biomedica* 2021 ;Volum 92.(2)

UNN

Sahebi, Reza; Ghazizadeh, Hamideh; Avan, Amir; Tayefi, Maryam; Saffar-Soflaei, Sara; Mouhebati, Mohsen; Esmaily, Habibollah; Ferns, Gordon A.; Hashemzadeh-Chaleshtori, Morteza; Ghayour-Mobarhan, Majid; Farrokhi, Effat.

Association between a genetic variant in scavenger receptor class B type 1 and its role on codon usage bias with increased risk of developing coronary artery disease. *Clinical Biochemistry* 2021 ;Volum 95. s.60-65

UNN

Sharifan, Payam; Yaghooti-Khorasani, Mahdiyeh; Asadi, Zahra; Darroudi, Susan; Rezaie, Mitra; Safarian, Mohamad; Vatanparast, Hassan; Eslami, Saeid; Tayefi, Maryam; Pourrahim, Elham; Mahmoudi, Elham; Mohammadi-Bajgiran, Maryam; Khorasanchi, Zahra; Ghazizadeh, Hamideh; Bagherniya, Mohammad; Ferns, Gordon; Esmaily, Habibollah; Ghayour Mobarhan, Majid.

Association of dietary patterns with serum vitamin D concentration among Iranian adults with abdominal obesity. *Nutrition Journal* 2021

UNN

Sharifan, Payam; Ziaee, Amirhosein; Darroudi, Susan; Rezaie, Mitra; Safarian, Mohamad; Eslami, Saeid; Khadem-Rezaian, Majid; Tayefi, Maryam; Bajgiran, Maryam Mohammadi; Ghazizadeh, Hamideh; Khorasanchi, Zahra; Bagherniya, Mohammad; Sardar, Mohammad Ali; Ferns, Gordon A.; Vatanparast, Hassan; Ghayour-Mobarhan, Majid.

Effect of low-fat dairy products fortified with 1500IU nano encapsulated vitamin D3 on cardiometabolic indicators in adults with abdominal obesity: a total blinded randomized controlled trial. *Current Medical Research and Opinion* 2021 ;Volum 37.(4) s.579-588

UNN

Silsand, Line; Severinsen, Gro-Hilde; Berntsen, Gro.

Preservation of person-centered care through videoconferencing for patient follow-up during the covid-19 pandemic:case study of a multidisciplinary care team. *JMIR Formative Research* 2021 ;Volum 5.(3)

UNN UiT

Silsand, Line; Severinsen, Gro-Hilde; Pedersen, Rune.

Structuring the Electronic Patient Record; an Easy Way to Improve Data Usability?. *Reports of the European Society for Socially Embedded Technologies* 2021

UNN

Skafle, Ingjerd; Gabarron, Elia; Dechsling, Anders; Nordahl-Hansen, Anders Johan.

Online Attitudes and Information-Seeking Behavior on Autism, Asperger Syndrome, and Greta Thunberg.. *International Journal of Environmental Research and Public Health (IJERPH)* 2021 ;Volum 18.(9) s.4981

HIOF UNN

Smaradottir, Berglind; Severinsen, Gro-Hilde; Steinsbekk, Aslak; Berntsen, Gro Karine Rosvold.

User-centred Design of a Digital Care Plan for Patients and Professionals in Cross-organisational Teams. *Studies in Health Technology and Informatics* 2021 ;Volum 281. s.901-905

UIA NTNU UNN UiT

Trondsen, Marianne Vibeke; Manskow, Unn Sollid.

Å være terapeut i en unntakstilstand: samtaleterapi på nett under koronapandemien til unge som har foreldre med rusproblemer. *Tidsskrift for psykisk helsearbeid* 2021 ;Volum 18.(02) s.125-137 UNN

Cox, Narelle S.; Dal Corso, Simone; Hansen, Henrik; McDonald, Christine F.; Hill, Catherine J.; Zanaboni, Paolo; Alison, Jennifer A.; O'Halloran, Paul; MacDonald, Heather; Holland, Anne E..

Telerehabilitation for chronic respiratory disease. *Cochrane Database of Systematic Reviews* 2021 ;Volum 1.

UIT UNN

Denecke, Kerstin; Gabarron Hortal, Elia Dolores; Petersen, Carolyn; Merolli, Mark.

Defining participatory health informatics – a scoping review. *Informatics for Health and Social Care* 2021

UNN

Furukawa, Toshi A.; Sukanuma, Aya; Ostinelli, Edoardo; Andersson, Gerhard; Beevers, Christopher G; Shumake, Jason; Berger, Thomas; Boele, Florian W; Buntrock, Claudia; Carlbring, Per; Choi, Isabella; Christensen, Helen; Mackinnon, Andrew; Dahne, Jennifer; Huibers, Marcus J H; Ebert, David; Farrer, Louise; Forand, Nicholas; Strunk, Daniel R.; Ezawa, Iony; Forsell, Erik; Kaldo, Viktor; Geraedts, Anna; Gilbody, Simon; Littlewood, Elizabeth; Brabyn, Sally; Hadjistavropoulos, Heather; Schneider, Luke; Johansson, Robert; Kenter, Robin; Kivi, Marie; Björkelund, Cecilia; Kleiboer, Annet; Riper, Heleen; Klein, Jan Philipp; Schröder, Johanna; Meyer, Björn; Moritz, Steffen; Bücken, Lara; Lintvedt, Ove; Johansson, Peter; Lundgren, Johan; Milgrom, Jeannette; Gemmill, Alan W.; Mohr, David C.; Montero-Marin, Jesus; Garcia-Campayo, Javier; Nobis, Stephanie; Zarski, Anna Carlotta; O'Moore, Kathleen; Williams, Alishia D.; Newby, Jill M.; Perini, Sarah; Phillips, Rachel; Schneider, Justine; Pots, Wendy; Pugh, Nicole; Richards, Derek; Rosso, Isabelle M.; Rauch, Scott; Sheeber, Lisa B.; Smith, Jessica; Spek, Viola; Pop, Victor; Unlü, Bürcin; Van Bastelaar, Kim; van Luenen, Sanne; Garnefski, Nadia; Kraaij, Vivian; Vernmark, Kristofer; Warmerdam, Lisanne; Van Straten, Annemieke; Zagorscak, Pavle; Knaevelsrud, Christine; Heinrich, Manuel; Miguel, Clara; Cipriani, Andrea; Efthimiou, Orestis; Karyotaki, Eirini; Cuijpers, Pim.

Dismantling, optimising, and personalising internet cognitive behavioural therapy for depression: a systematic review and component network

meta-analysis using individual participant data. *The Lancet Psychiatry* 2021 ;Volum 8.(6) s.500-511

UNN UiB

Jenssen, Marit Dagny Kristine; Bakkevoll, Per Atle; Ngo, Phuong; Budrionis, Andrius; Fagerlund, Asbjørn Johansen; Tayefi, Maryam; Bellika, Johan Gustav; Godtlielsen, Fred.

Machine Learning in Chronic Pain Research: A Scoping Review. *Applied Sciences* 2021 ;Volum 11.(7)

UIT UNN

Karyotaki, Eirini; Efthimiou, Orestis; Miguel, Clara; BERPpohl, Frederic; Furukawa, Toshi A.; Cuijpers, Pim; Riper, Heleen; Patel, Vikram; Mira, Adriana; Gemmill, Alan W.; Yeung, Albert; Lange, Alfred; Williams, Alishia D.; Geraedts, Anna; Mackinnon, Andrew; van Straten, Annemieke; Meyer, Björn; Björkelund, Cecilia; Knaevelsrud, Christine; Beevers, Christopher G; Botella, Christina; Strunk, Daniel R.; Mohr, David C.; Ebert, David; Kessler, David; Richards, Derek; Littlewood, Elizabeth; Forsell, Erik; Feng, Fan; Wang, Fang; Andersson, Gerhard; Hadjistavropoulos, Heather; Christensen, Heleen; Ezawa, Iony; Choi, Isabella; Rosso, Isabelle M.; Klein, Jan Philipp; Shumake, Jason; Garcia-Campayo, Javier; Milgrom, Jeannette; Smith, Jessica; Montero-Marin, Jesus; Newby, Jill M.; Breton-Lopez, Juana; Schneider, Justine; Vernmark, Kristofer; Bücken, Lara; Sheeber, Lisa B.; Warmerdam, Lisanne; Farrer, Louise; Heinrich, Manuel; Huibers, Marcus J H; Kivi, Marie; Kraepelien, Martin; Forand, Nicholas; Pugh, Nicky; Lindefors, Nils; Lintvedt, Ove; Zagorscak, Pavle; Carlbring, Per; Phillips, Rachel; Johansson, Robert; Kessler, Ronald C.; Brabyn, Sally; Perini, Sarah; Rauch, Scott; Gilbody, Simon; Moritz, Steffen; Berger, Thomas; Pop, Victor; Kaldo, Viktor; Spek, Viola; Forsell, Yvonne.

Internet-Based Cognitive Behavioral Therapy for Depression: A Systematic Review and Individual Patient Data Network Meta-analysis.

JAMA

psychiatry 2021

UNN

Saberi-Karimian, Maryam; Khorasanchi, Zahra; Ghazizadeh, Hamideh; Tayefi, Maryam; Saffar, Sara; Ferns, Gordon A.; Ghayour-Mobarhan, Majid.

Potential value and impact of data mining and machine learning in clinical diagnostics. *Critical reviews in clinical laboratory sciences* 2021 s.1-22

UNN

Tayefi, Maryam; Ngo, Phuong; Chomutare, Taridzo; Dalianis, Hercules; Salvi, Elisa; Budrionis, Andrius; Godtlielsen, Fred.

Challenges and opportunities beyond structured data in analysis of electronic health records. *Wiley Interdisciplinary Reviews: Computational*

Statistics 2021

s.1-19

UNN UIT

Reports

Breivik, Elin; Rotvold, Gunn Hilde; Michalsen, Kamilla; Steen Lindseth, Lene; Bjørvig, Siri.

Kunnskapsoppsummering om effekter av trygghets- og mestringsteknologi. Tromsø: Nasjonalt senter for e-helseforskning 2021 (ISBN 978-82-8242-102-7) 21 s. NSE-rapport(02-2021)

UNN

Kristiansen, Eli; Breivik, Elin; Bergmo, Trine Strand; Johansen, Monika Alise; Zanaboni, Paolo.

E-konsultasjon og sykmelding - Undersøkelse av erfaringer med unntak fra krav til personlig fremmøte under covid-19-pandemien. Tromsø: Nasjonalt senter for e-helseforskning 2021 74 s. NSE-rapport(03-2021)

UNN

Linstad, Line Helen; Ekeland, Anne G.

Kunnskapsoppsummering om styring og ledelse i e-helse. Tromsø: Nasjonalt senter for e-helseforskning 2021 (ISBN 978-82-8242-101-0) 21 s. NSE-rapport(01-2021)

UNN

Lundberg, Lene; Lind, Karianne Fredenfeldt; Berntsen, Gro Karine Rosvold; Dedeu, Toni.

Use of Ehealth Tools in Primary Health Care during the Covid-19 Pandemic. World Health Organization Europe 2021 7 s.

UNN UiT

Nordheim, Espen Solbakken; Dyb, Kari; Berntsen, Gro Karine Rosvold.

Gode pasientforløp - en midtveisevaluering. Tromsø: Nasjonalt senter for e-helseforskning 2021 (ISBN 978-82-8242-104-1) 41 s. NSE-rapport(04-2021)

UNN

Part of book

Chomutare, Taridzo; Yigzaw, Kassaye Yitbarek; Delgado Olabarriaga, Silvia; Makhlysheva, Alexandra; de Oliveira, Marcela Tuler; Silsand, Line; Krefting, Dagmar; Penzel, Thomas; Hillen, Christiaan; Bellika, Johan Gustav.

Healthcare and data privacy requirements for e-health cloud: A qualitative analysis of clinician perspectives. I: *2020 IEEE International Conference on E-health Networking, Application & Services (HEALTHCOM)*. IEEE conference proceedings 2021 ISBN 978-1-7281-6267-6.

UiT UNN

Conference contributions

Dyb, Kari; Warth, Line Lundvoll.

Electronic medicines management - introduksjon. Kick off eMM; 2021-11-29 - 2021-11-30
UiT UNN

Dyb, Kari; Warth, Line Lundvoll.

eMM- electronic medicines management : lokale profesjonsfellesskap 1. Workshop; 2021-11-15 - 2021-11-16
UiT UNN

Engzelius, Jan Morten; Kydland, Øystein; Sævild, Anita; Andresen, Hanne; Moen, Anne.

Pasientenes egeninnsats ved bruk av egne helsedata. EHiN 2021; 2021-11-08 - 2021-11-09
UiO UNN

Fagerlund, Asbjørn Johansen; Smaradottir, Berglind; Salvi, Elisa; Fredeng, Aina; Bellika, Johan Gustav.

How to Retain Participants in User-centered Design? Towards Recommendations for Minimizing Dropouts. MedInfo 2021; 2021-10-02 - 2021-10-04
UNN UIA

Gullslett, Monika Knudsen.

Emestring - Psykisk helse på nett tilbyr asynkron behandling for angst og depresjon.. Facebook, informasjonsrettede video; 2021-09-01 - 2021-09-01
USN UNN

Gullslett, Monika Knudsen.

Forskningssenter for Digitale Psykiske Helsetjenester. Presentasjon av prosjektet for studenter ved master i digitalisering og innovasjon i helse og velferdstjenester ved Universitetet i Sørøst-Norge (USN); 2021-09-21 - 2021-09-21
USN UNN

Gullslett, Monika Knudsen.

Linn Nathalie Størme forsker på forbedring av helsetjenester hos Forhelse. . Facebook, informasjonsrettede video; 2021-09-01 - 2021-09-01
USN UNN

Gullslett, Monika Knudsen.

Mamma Mia, en app om å bli mamma.. Facebook, informasjonsrettede video; 2021-09-01 - 2021-09-01
UNN USN

Gullslett, Monika Knudsen.

Senterleder Tine Nordgreen presenterer Forhelse, som er et senter for forskningsdrevet innovasjon.. Facebook, informasjonsrettede video; 2021-09-01 - 2021-09-01
UNN USN

Gullslett, Monika Knudsen.

Use of video consultation in specialized mental health services: a qualitative study of therapists' experiences of video consultations during the period of Covid-19 restrictions.. HTAI; 2021-06-23 - 2021-06-23
UNN USN

Johansen, Monika Alise.

Health Professionals' and Patients Experience with Patients Accessing their Electronic Health Record in Norway. Vitalis 2021; 2021-05-18 - 2021-05-20
UNN

Knarvik, Undine.

Muligheter og utfordringer med velferdsteknologi for barn og unge med funksjonsnedsettelse. NNFF, 9.forskningskonferanse; 2021-06-07 - 2021-06-08
UNN

Knarvik, Undine.

Velferdsteknologi for barn og unge med funksjonsnedsettelse - Brukererfaringer. Workshop AP5 - Velferdsteknologi til barn og unge med nedsatt funksjonsevne; 2021-06-14 - 2021-06-14

UNN

Knarvik, Undine.

Velferdsteknologi for barn og unge med funksjonsnedsettelse - 5 års forskning og utredning. Teknologi i helse og omsorg (THOM) konferanse; 2021-05-11 - 2021-05-11

UNN

Kristiansen, Eli; Breivik, Elin; Bergmo, Trine Strand; Johansen, Monika Alise.

E-konsultasjon og sykmelding: Undersøkelse av erfaringer med unntak fra krav til personlig fremmøte under covid-19-pandemien. Presentasjon for Arbeids- og sosialdep, HOD, Helsedir og Arbeids- og velferdsdir.; 2021-09-08 - 2021-09-08

UNN

Kristiansen, Eli; Johnsen, Tor Magne.

Videokonsultasjoner på fastlegekontoret under pandemien. Legeforeningens kurs for helsepolitikk; 2021-04-27 - 2021-04-27

NTNU UNN

Kristiansen, Eli; Norberg, Børge Lønnebakke; Johnsen, Tor Magne.

Videokonsultasjoner med fastlegen under pandemien. Webinarserie Digital Hjemmeoppfølging; 2021-09-24 - 2021-09-24

NTNU UNN

Kristiansen, Eli; Norberg, Børge Lønnebakke; Zanaboni, Paolo.

E-konsultasjon og andre digitale tjenester med fastlegen: erfaringer og effekter for pasienter og helsetjenesten. Presentasjon for den Allmennt medisinske forskningsenheten v/UiT; 2021-05-27 - 2021-05-27

NTNU UNN

56

Kristiansen, Eli; Norberg, Børge Lønnebakke; Zanaboni, Paolo.

Norske erfaringer med videokonsultasjoner med fastlegen under pandemien. Lunchwebinar; 2021-03-19 - 2021-03-19

UNN NTNU

Kristiansen, Truls Tunby; Linstad, Line Helen.

Helsefellesskap - høring og rasjonalitetskonflikt. NEON 2021; 2021-11-24 - 2021-11-26

UiT UNN

Lauvhaug Nybakke, Henriette.

Videokonsultasjon for unge innen psykisk helsevern. EHiN 2021; 2021-11-09 - 2021-11-09

UNN

Lundberg, Lene.

WHO Collaborating Centre for Digital Health and Telemedicine. WHO Collaborating Centres Regional Meeting: United Action for Better Health in Europe; 2021-11-02 - 2021-11-03

UNN

Moen, Anne.

Citizen Engagement in Digital Health. Hospital Italiano annual conference; 2021-11-16 - 2021-11-16

UiO UNN

Moen, Anne.

INNSIKT - nettverkserfaringer og oppsummering. Slutt-webinar - <https://play.quickchannel.com/play/6pkqfgp>; 2021-12-01 - 2021-12-01

UiO UNN

Moen, Anne.

Tilrettelagt medisinformasjon - Gravitare-Health prosjektet.. Webinar, Digitalisering på legemiddelfeltet.; 2021-01-27 - 2021-01-27

UiO UNN

Norberg, Børge Lønnebakke.

E-helse i fremtiden. EHiN 2021; 2021-11-09 - 2021-11-10
UNN NTNU

Norberg, Børge Lønnebakke.

Forberedelse doktorgrad - artikkelsskriving. PhD-konferanse; 2021-04-08 - 2021-04-09
NTNU UNN

Norberg, Børge Lønnebakke; Kristiansen, Eli.

Videokonsultasjoner. NAFALM - Norsk Allmennmedisinsk Forening Forskerskole; 2021-09-17 - 2021-09-17
NTNU UNN

Rotvold, Gunn Hilde.

Introduction of Welfare Technology in Norwegian Municipalities_PhD-study. Nordisk forskningsseminar for PROTECT-prosjektet;
2021-09-16 -2021-09-17 UNN

Rødseth, Eirin.

PN30: Experiences from the clinic - The University Hospital of North Norway's reaction to the pandemic: A rapid shift and tempo change of earlier tedious processes. HTAi 2021; 2021-06-19 - 2021-06-23
UNN

Schopf, Thomas Roger Griesbeck.

E-health in Norway, Before and after the Covid-19 pandemic. 9th World Congress of Tele dermatology, Imaging and AI for Skin Diseases;
2021-12-09 - 2021-12-10 UNN

Schopf, Thomas Roger Griesbeck.

Managing atopic eczema in society and the health care system. Utdanning for pasienter med eksem; 2021-11-27 - 2021-11-27
UNN

Schopf, Thomas Roger Griesbeck.

Telemedisin før og etter korona. Årsmøte Norsk forening for dermatologi og venerologi; 2021-04-16 - 2021-04-16
UNN

Smaradottir, Berglind; Severinsen, Gro-Hilde; Steinsbekk, Aslak; Berntsen, Gro Karine Rosvold.

User-centred Design of a Digital Care Plan for Patients and Professionals in Cross-organisational Teams. Medical Informatics Europe
2021; 2021-05-29 - 2021-05-31
UIA NTNU UNN UiT

Trondsen, Marianne Vibeke.

Digital kommunikasjon med barn og unge som er pårørende. Masteremne: Barn som pårørende når foreldre eller søsken er alvorleg sjuke eller dør; 2021-04-20 - 2021-04-20
UNN

Trondsen, Marianne Vibeke.

Velferdsteknologi for barn og unge med funksjonsnedsettelse: Muligheter og utfordringer. Webinar:Velferdsteknologi som en integrert del av kommunale helse- og omsorgstjenester, fortsatt utfordringer og muligheter; 2021-10-06 - 2021-10-06
UNN

Trondsen, Marianne Vibeke.

10 år med forskernettverket i BarnsBeste: Å gjøre hverandre gode. 10-års jubileumskonferanse for forskernettverket i BarnsBeste;
2021-11-16 -2021-11-16 UNN

Trondsen, Marianne Vibeke; Manskow, Unn Sollid.

Videobasert terapi på nett for unge som har foreldre med rusproblemer.. Brukerrådskonferanse i Blå Kors Kompasset; 2021-10-23 - 2021-10-23
UNN

Trondsen, Marianne Vibeke; Rødseth, Eirin.

Videobaserte verktøy til samtaler med barn og unge.. Fagseminar Statens Barnehus; 2021-02-02 - 2021-02-02

UNN

Trondsen, Marianne Vibeke; Saus, Merete.

FoU-styrets synspunkter og forventninger til SANKS nå og fremover. Dialogmøte i Samisk nasjonal kompetansetjeneste – psykisk helsevern og rus (SANKS); 2021-11-02 - 2021-11-03

UNN UiT

Warth, Line Lundvoll.

eMM-prosjektpresentasjon. Strategisamling - parallellsesjon; 2021-10-12 - 2021-10-12

UNN UiT

Årsand, Eirik.

Status on patient-gathered health data using mHealth in diabetes. Integrating mobile health data in health service value chains; 2021-04-29

UiT UNN

Media contributions

Bellika, Johan Gustav; Halvorsen, Peder Andreas; Nilsen, Lisbeth.

Slik kan du sammenligne praksisen din med fastlegekolleger – uten å bli identifisert. Legeforeningen.no - Forskningsnytt [Internett] 2021-05-24 UiT UNN

Bellika, Johan Gustav; Tømmerbakke, Siri Gulliksen.

Nytt verktøy gjør at fastleger kan sammenligne seg med andre – helt anonymt. Dagens Medisin [Internett] 2021-05-31 UNN

Bellika, Johan Gustav; Yigzaw, Kassaye Yitbarek; Halvorsen, Peder Andreas; Johnsen, Oddny.

New tool makes it possible to do research on patient records without seeing sensitive information. ScienceNorway.no [Internett] 2021-01-24 UNN UiT

Berntsen, Gro Karine Rosvold; Aasen, Johanne; Landanger, Martine; Mårdalen, Irene.

Personfokuset behandling hjelper skrøpelige eldre – slik gjør de det i Tromsø. Fysioterapeuten [Fagblad] 2021-12-07 UNN

Bønes, Erlend; Liljebakk, Emil; Nygård, Stig.

Forskjellige journalsystem skaper trøbbel for FACT-team. rop.no [Internett] 2021-05-05 UNN

Fagerlund, Asbjørn Johansen; Helmikstøl, Øystein.

«Journalen min er ingen kladdebok for behandlere». Tidsskrift for norsk psykologforening [Internett] 2021-05-03 UNN

Gabarron, Elia; Lundberg, Lene.

Can we stop misinformation about Covid-19?. ScienceNorway.no [Internett] 2021-06-20 UNN

Gabarron, Elia; Lundberg, Lene.

Hvordan stoppe feilinformasjon om covid-19?. Forskning.no [Internett] 2021-06-16 UNN

Johnsen, Tor Magne; Norberg, Børge Lønnebakke; Kristiansen, Eli; Nilsen, Lisbeth.

Videomøte med fastlegen var i halvparten av tilfellene like bra som time på legekontoret. Forskning.no [Internett] 2021-02-21 NTNU UNN

Johnsen, Tor Magne; Norberg, Børge Lønnebakke; Kristiansen, Eli; Nilsen, Lisbeth; Lundberg, Lene.

In half of the cases, a video meeting with the doctor was as good as meeting in person. ScienceNorway.no [Internett] 2021-04-25 NTNU UNN

Jøsendal, Anette Vik; Johnsen, Oddny.

Pasientsikkerhet: Ordningen med multidoser mangler retningslinjer. Forskning.no [Internett] 2021-07-30 UNN

Knoff, Atle Egil; Randine, Pietro; Årsand, Eirik.

Denne maskinen gir deg akkurat så mye juice som blodsukkeret ditt trenger. Diabetesforbundets websider [Internett] 2021-02-02 UNN UiT

Kristiansen, Eli; Lundberg, Lene; Zanaboni, Paolo; Johansen, Monika Alise.

Under pandemien: Pasienter fornøyde med å få sykmelding uten fysisk oppmøte. Forskning.no [Internett] 2021-08-25 UNN

Kristiansen, Eli; Olafsson, Kjartan; Zerener, Anders.

Lege advarer etter e-konsultasjon-studie: – Som å sammenligne epler og pærer. Dagens Medisin [Internett] 2021-08-19 UNN

Lauvhaug Nybakke, Henriette; Gullslett, Monika Knudsen; Frimand, Marte.

Foreslår digital vergetjeneste for dem som faller utenfor digitalt. rop.no [Internett] 2021-09-27

UNN

Lundberg, Lene; Lind, Karianne Fredenfeldt; Berntsen, Gro Karine Rosvold; Berntsen, Hasse.

WHO report highlights innovation in Norwegian primary health care. ScienceNorway.no [Internett] 2021-10-07

UNN

Lundberg, Lene; Lind, Karianne Fredenfeldt; Berntsen, Gro Karine Rosvold; Simonsen, Michael.

Rapporterte om digitale verktøy og pandemi til WHO. Dagens Medisin [Internett] 2021-07-15

UNN

Makhlysheva, Alexandra; Lundberg, Lene.

Grundigere analyser av helsedata kan gi pasienter bedre behandling. Forskning.no [Internett] 2021-02-23

UNN

Makhlysheva, Alexandra; Lundberg, Lene.

More thorough analyses of health data can boost patient care. ScienceNorway.no [Internett] 2021-03-11

UNN

Manskow, Unn Sollid; Kristiansen, Truls Tunby; Berntsen, Hasse.

Helsepersonell sliter med å få tak i informasjon om hvilke legemidler pasientene deres bruker. Forskning.no [Internett] 2021-05-26

UNN

Ngo, Phuong; Johnsen, Oddny.

Kunstig intelligens kan hjelpe diabetespasienter å trene trygt. Forskning.no [Internett] 2021-05-19

UNN

Norberg, Børge Lønnebakke; Kristiansen, Eli; Lundberg, Lene.

Møt legen på video. Pensjonisten [Tidsskrift] 2021-11-01

NTNU UNN

Skafle, Ingjerd; Gabarron, Elia; Berntsen, Hasse.

Greta Thunbergs diagnose gjør henne til både et forbilde og en hakkekylling. Forskning.no [Internett] 2021-07-16

HIOF UNN

Smaradottir, Berglind; Fagerlund, Asbjørn Johansen; Arnstad, Mali A..

Digital meetings sped up app development. ScienceNorway.no [Internett] 2021-01-14

UNN

Smaradottir, Berglind; Fagerlund, Asbjørn Johansen; Arnstad, Mali A..

Digitale møter fikk fart på utvikling av helseapp. Forskning.no [Internett] 2021-01-07

UNN

Tayefi, Maryam; Berntsen, Hasse.

Ustrukturerte data fra pasientjournaler kan gi bedre behandling. Forskning.no [Internett] 2021-04-23

UNN

Trondsen, Marianne Vibeke; Manskow, Unn Sollid; Berntsen, Hasse; Blixhavn, Anders.

Terapeutene opplevde overgangen fra fysisk- til digital terapi som brå, men bra. Forskning.no [Internett] 2021-07-28

UNN

Trondsen, Marianne Vibeke; Rotvold, Gunn Hilde; Knarvik, Undine; Johnsen, Oddny.

Bodø vil være landets beste oppvekstkommune. De lytter til barn og unge som trenger velferdsteknologi. Forskning.no [Internett] 2021-02-10 UNN

Zanaboni, Paolo; Manskow, Unn Sollid; Kræmer, Morten.

Folk i nord kan bli mer aktive med ONWARDS. Morrasendinga fra NRK i Troms [Radio] 2021-05-11

UNN



Norwegian Centre for
E-health Research

ehealthresearch.no