Regional development impacts of digital health care and social care

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A Nordic project

— *Healthcare and care through distance spanning solutions* (2018-2020)
  - Vård och Omsorg På Distans (VOPD)
  - Initiated and funded by the Swedish chairmanship program of the Nordic Council of Ministers (called *An inclusive, innovative and safe Nordic region*)
  - Managed by the Centre for Rural Medicine - Region Västerbotten
  - https://www.healthcareatdistance.com/

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Nordregio study

— Focus on the impacts of digitalization on regional development and economic, social and environmental sustainability in seven Nordic case study regions

— Conducted by a large team of researchers from Nordregio
  • Project manager: Anna Lundgren (PhD)

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Digital Health Care and Social Care

Regional development impacts in the Nordic countries

Anna Lundgren,
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Overview of the study

— **Theoretically** based on Institutional framework within which regional development effects take place (Williamson 2005, Lundgren 2017)

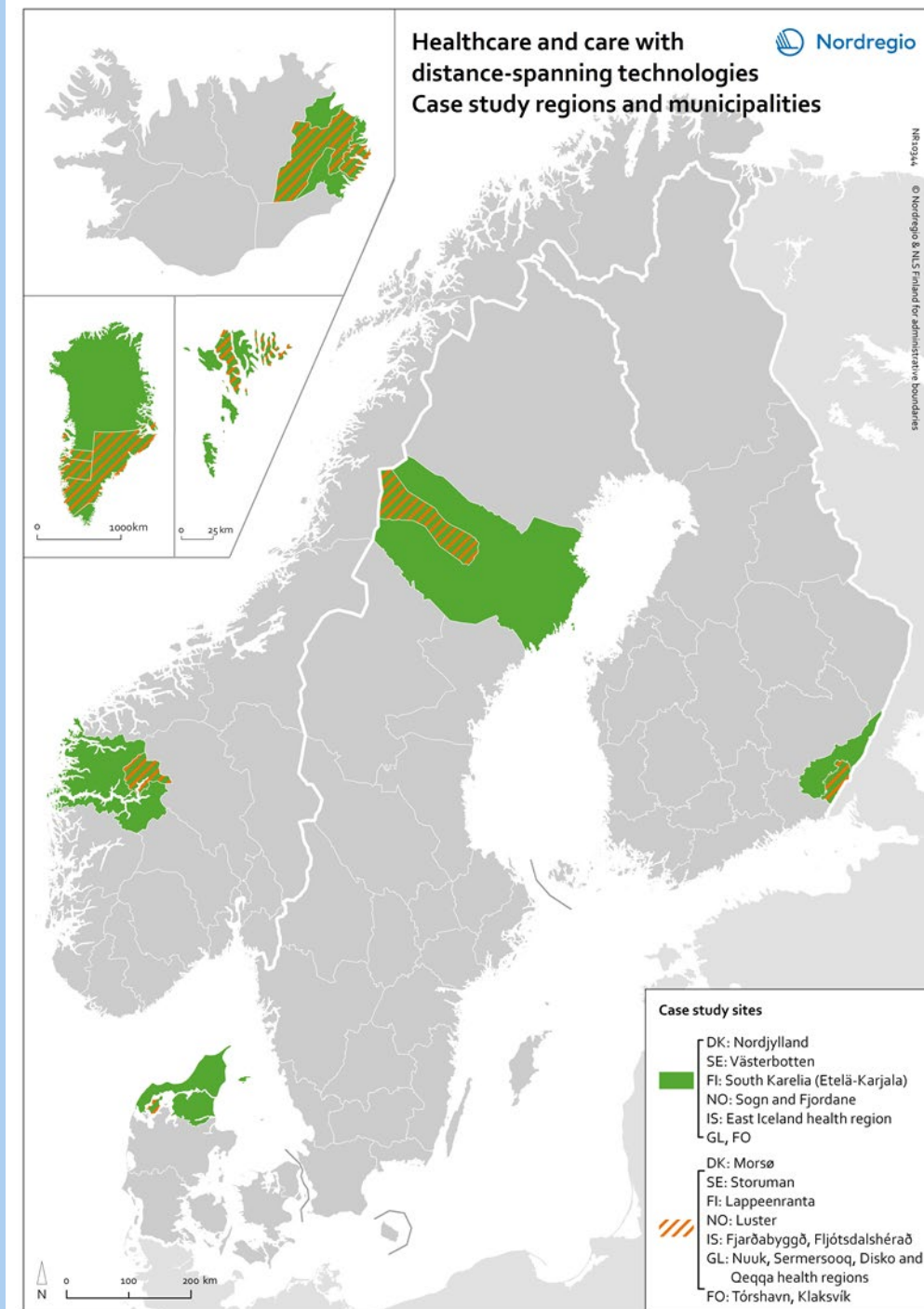| Institutional levels	Time frame of change
Level 1: Institutional embeddedness / Culture	100–1,000 years
Level 2: Institutional environment /Government	10-100 years
Level 3: Governance / Policy	1–10 years
Level 4: Resource allocation / Practice	Continuous

— **Reflexive approach** allowing theory and empirical observations interact to improve understanding of a phenomenon

— **Research questions:**
1. What are the **regional development effects** of implementing digital solutions in health care and social care?
2. What are the **obstacles** of implementing digital solutions in health care and social care?
3. What are the **potentials** of implementing digital solutions in health care and social care from a regional development perspective?
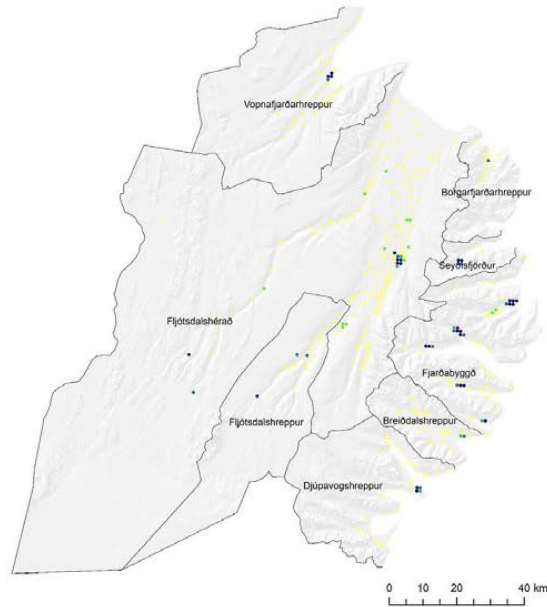
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Methods

— **Case studies:**
- Sogn and Fjordane: Luster (Norway)
- East Iceland: Fjarðabyggð and Fljótsdalshéraði (Iceland)
- Västerbotten: Storuman (Sweden)
- Nordjylland: Morsø (Denmark)
- South Karelia: Lappeenranta (Finland)
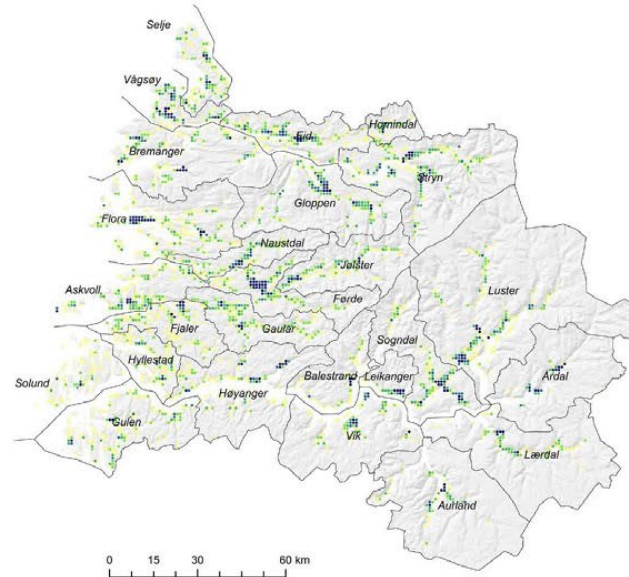- Faroe Islands and Greenland

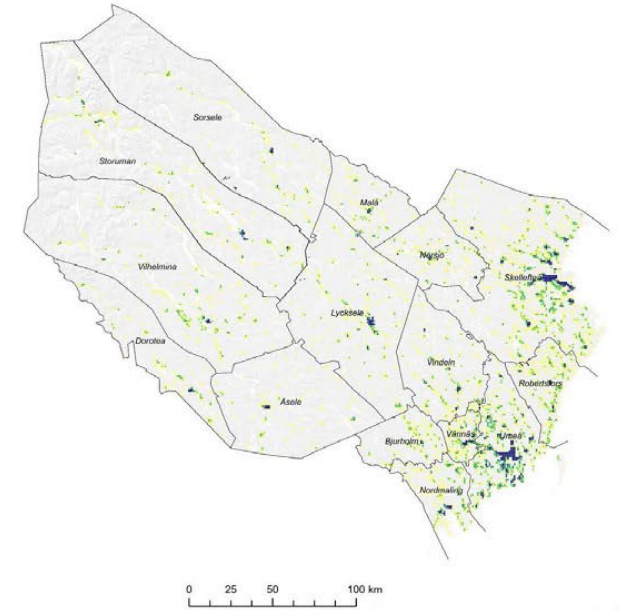— Desk studies, field studies, interviews and an accessibility study in GIS

Healthcare and care with distance-spanning technologies
Case study regions and municipalities

Case study sites

DK: Nordjylland
SE: Västerbotten
FI: South Karelia (Etelä-Karjala)
NO: Sogn and Fjordane
IS: East Iceland health region
GL, FO

DK: Morsø
SE: Storuman
FI: Lappeenranta
NO: Luster
IS: Fjarðabyggð, Fljótsdalshérað
GL: Nuuk, Sermersooq, Disko and Qeqqa health regions
FO: Tórshavn, Klaksvík

Austurland

Sogn og Fjordane

Västerbotten

Population per km2

- 1 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- >100
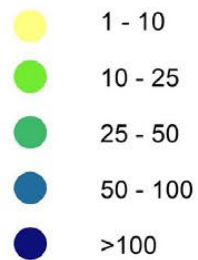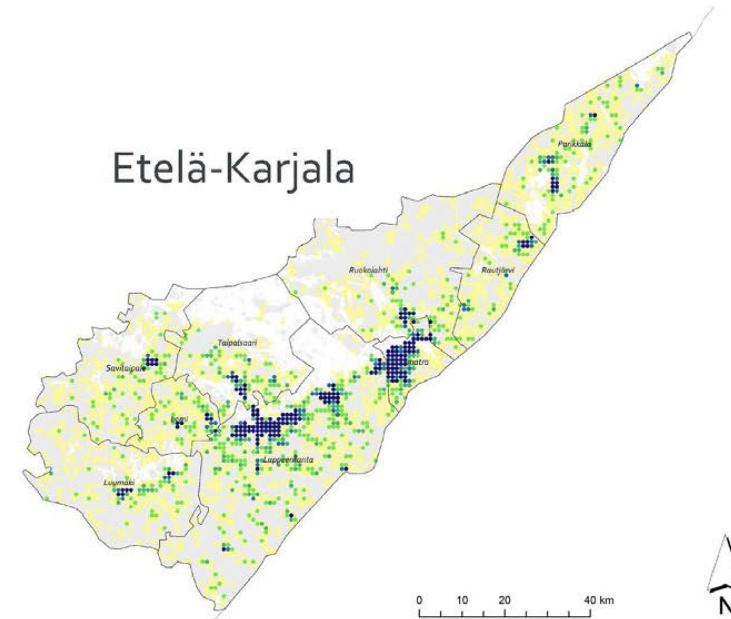
Nordjylland

Etelä-Karjala

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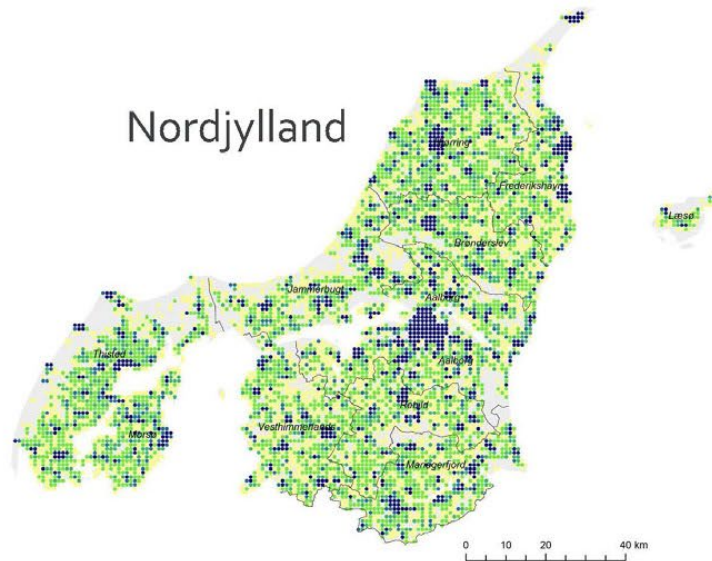
Examples of effects

— **Quality:** Increased safety and quality of life, increased quality in the provision of health care, spatially-distanced medical consultations

— **Efficiency:** Shared information and data, adaptation to individual needs, cost saving potentials, improved flexibility, improved ability to recruit

— **Inclusion:** Involvement of patients, facilitated dialogue

— **Accessibility:** Increased accessibility for inhabitants and professionals, remote video consultations

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Table 5.1. Examples of effects and potentials from case study regions.

	Norway	Finland	Sweden	Denmark	Iceland	Greenland	Faroe Islands
Quality (incl. safety and flexibility)	Improved quality of health care and social care through sharing of data.	Increased quality and safety in home care. E.g. GPS, sensors and safety alarms.	Increased quality of life. E.g. elderly can live longer at home.	Improved flexibility for patients. E.g. medical consultation at distance.	Increased quality and availability of care. E.g. decision support for health care professionals. Improved flexibility for patients and health care staff.	Improved quality of health care through access to specialised health care. E.g. through consultations with specialists at hospitals abroad.	Improved safety for patients through access to external expertise.
Efficiency (incl. staff, organisation)	Improved cost effectiveness. E.g. Reduced costs for administration, no shows to medical appointments and transports.	Reduced economic costs. E.g. Health care and social care services adapted to individual needs.	Reduced economic costs for health care sector. E.g. Reduced time in hospitals.	Increased attractivity possibilities to recruit health care staff in remote areas. E.g. general practitioners.	Increased possibilities to offer quality health care services in remote areas Better access to professionals. Increased competence building of professionals. Shorter distances for patients and staff. Economic savings.	Improved quality of health care through access to specialised health care. E.g. through consultations with specialists at hospitals abroad.	Improved efficiency through shared data among staff in home care.
Inclusion	Increased inclusion through easier interaction and closer follow up between health care professionals and patients, ex. COPD patients.	Increased inclusion through more frequent attendance of elderly in home care.	Increased participation and patients' involvement in own treatment.	Facilitated dialogue between health care staff, patient and relatives.	Higher flexibility and more alternatives for citizens in the health care system. Facilitated dialogue between health care staff, more competence building.		Facilitated dialogue between different professions in health care.
Accessibility	Improved accessibility to health care expertise. E.g. digitalised ambulances.	Increased accessibility for patients to health care services. E.g. digitalised moving laboratories.	Increased accessibility for patients to health care. E.g. virtual health rooms.	Improved accessibility to shared data. E.g. Health care meetings with different health care professionals.	Increased accessibility and availability of health care. E.g. video consultations with health care professionals.	Increased accessibility to health care. E.g. through Pipaluk.	Increased accessibility for health care professionals to expertise network.

Examples of obstacles

— **Governance:** Lack of change management, skills development and coordination among different stakeholders

— **Technical:** Lack of integration, interoperability and user-friendly solutions

— **Legislative:** Data security, patient data, laws accommodating digital tools change too slowly

— **Economic:** Lack of economic resources

— **Cultural:** Health care ethics, lack of interest and incentive among doctors, language barriers

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Table 5.2. Examples of obstacles in implementing digital solutions in health care and social care in the case study regions.

	Norway	Finland	Sweden	Denmark	Iceland	Greenland	Faroe Islands
Governance challenges	Lack of change management and skills development	Difficult to receive EU funding for new projects. Some devices too expensive to be introduced.	Lack of change management	Lack of coordination among different stakeholders Lack of change management	Central government responsible for health care. Contracts with specialist doctors include no obligation of placement of services.	Recruitment of skilled health care staff	Lack of sense of urgency among health care workers
Technical challenges	Lack of integrated data systems Lack of user-friendly digital solutions	Lack of integration and interoperability between data systems	Lack of integrated data systems	Lack of integrated data systems Lack of user-friendly digital solutions	Too little focus on usability of technology, not used to full potential.	Internet access (via cable, satellite and radio)	Lack of user-friendly digital solutions
Legislative challenges	Data security and patient data	Development of data security and AI	Not updated regulations hamper development	Risk management and resilience	Data security and integrity standards are high.		Data security and patient data
Economic challenges	Lack of economic resources (incl. time) for training Lack of economic incentives	Difficult to receive EU funding for new projects. Some devices too expensive to be introduced.	Lack of long-term economic resources	Lack of economic incentives	Reimbursement system for medical doctors, limited incentive to participate in eHealth. Limited funding to train/operate staff to use technology.	Lack of economic resources	Lack of economic incentives
Cultural challenges	Health care ethics and trust in technology in elderly care	Lack of interest among doctors and general attitude towards innovation and new ideas	What is health care ethics at distance?	Health care ethics	Lack of interest and incentive among medical doctors to change practices, have a strong professional culture	Language barriers and need for translation	Health care and social care ethics at distance

Results

— Significant potential for enhancing health and wellbeing across the Nordic Region

— Boosted regional development and contributed to economic (incl. jobs), social (e.g., spatial justice) and environmental sustainability (e.g., reduced transportation)

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Table 5.3. Potentials from digital in health care and social care contributing to regional development.
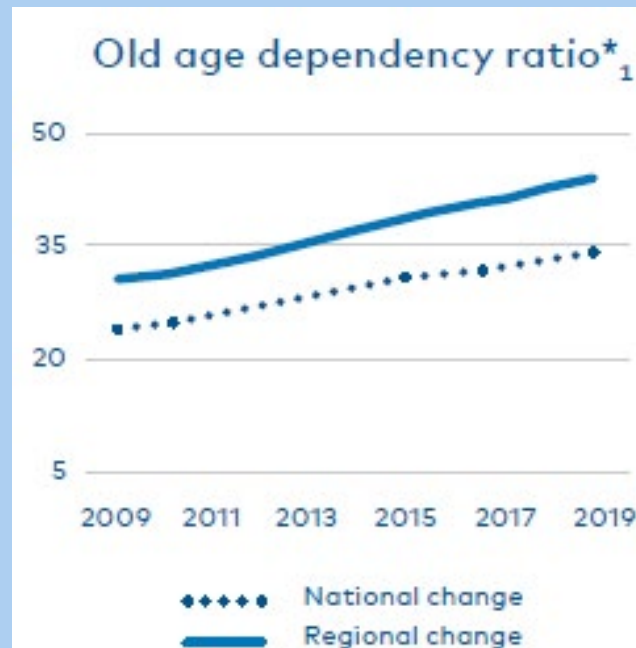
Change in different time frames	... to improve quality of services, efficiency and contribute to regional economic development	... to improve health, quality of life, inclusion and contribute to regional social development	... to improve accessibility and contribute to regional environmental development
Institutional embeddedness/ Culture *Change in 100 + years*	Involve health care professionals in discussions about digitalisation and health care and social care ethics. Foster research and broad discussion on the implications of digitalisation in society.	Involve health care professionals in discussions about digitalisation and health care and social care ethics. Foster research and broad discussion on the implications of digitalisation in society.	Foster research and broad discussion on the implications of digitalisation in society.
Institutional environment/ Government *Change in 10–100 years*	Adapt government and governance structures to a digitalised era. Improve broadband access and mobile infrastructure. Adapt legislation to a digitalised era. Allocate long-term financial resources for a digital transformation.	Adapt government and governance structures to a digitalised era. Improve broadband access and mobile infrastructure. Adapt legislation to a digitalised era. Allocate long term financial resources for a digital transformation.	Improve broadband access and mobile infrastructure. Adapt government and governance structures to a digitalised era. Adapt legislation to a digitalised era. Allocate long term financial resources for a digital transformation.
Governance/ Policy *Change in 1–10 years*	Activate leadership and change management. Adapt economic incentives and reimbursement models. Increase comprehensive research on implications of digitalisation related to quality of services and efficiency.	Activate leadership and change management. Increase comprehensive research on implications of digitalisation related to quality of life, inclusion and social development.	Activate leadership and change management. Increase comprehensive research on implications of digitalisation related to accessibility and spatial justice.
Resource allocation/ Practise *Continuous change*	Improve digitalisation skills among professionals. Improve digitalisation skills among citizens.	Improve digitalisation skills among citizens.	Improve digitalisation skills among professionals. Improve digitalisation skills among citizens.

# Some case study results…

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South Karelia, Finland

— Ongoing demographic change due to decreasing and ageing population

— Hospital district of *Eksote* established in 2010

- The urge to organize health care and social welfare services in an integrated manner, with the focus on a customer's perspective
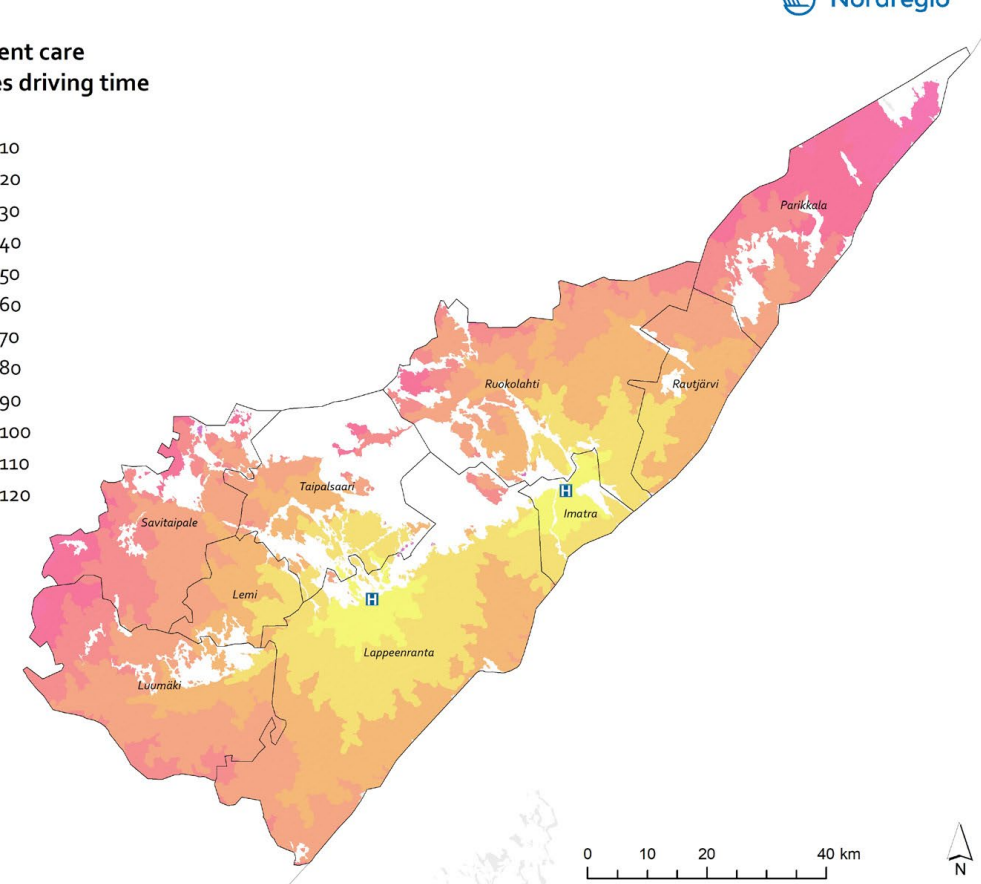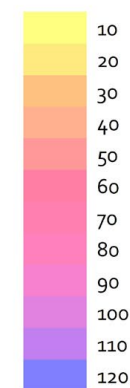
Old age dependency ratio*[1]

Year	
50	
35	
20	
5	

2009 2011 2013 2015 2017 2019

•••• National change
—— Regional change

Total population 2019*[1]	128,756
Population change 2009–2019*[1]	–3.66%
Life expectancy at birth*[1]	Females 83.8 Males 77.9

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Accessibility study


Out-patient primary care
Minutes driving time
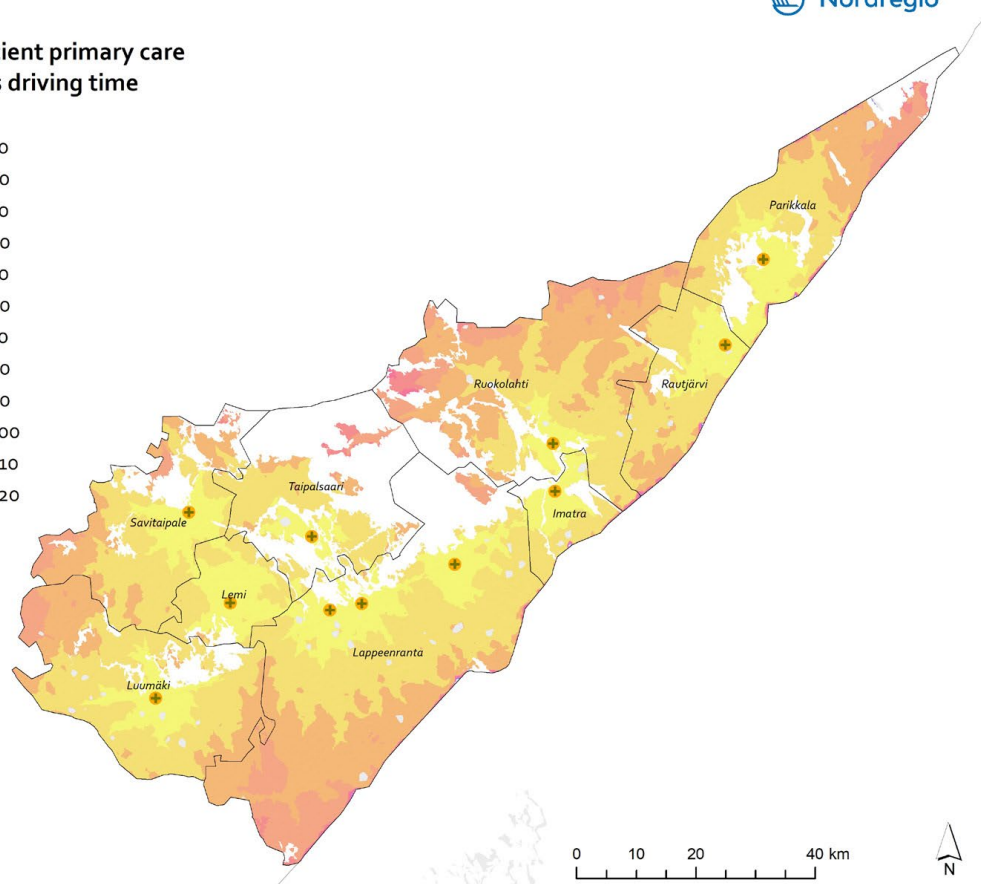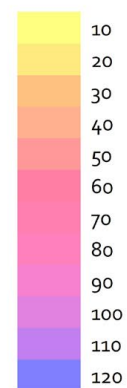
In-patient care
Minutes driving time

Digital solutions

— **Remote treatment:** Home care visits by using a video connection, telephone consultations, remote treatment vehicles (*Mallu*, *Malla* and EMS home mobile clinics)

— **Remote monitoring:** Safety alarms (*Navigil*), electronic medicine dispensers (*Aksitare*), automated meal systems (*Menumatti*)

— **New solutions:** Digital communication, online platforms, Artificial Intelligence

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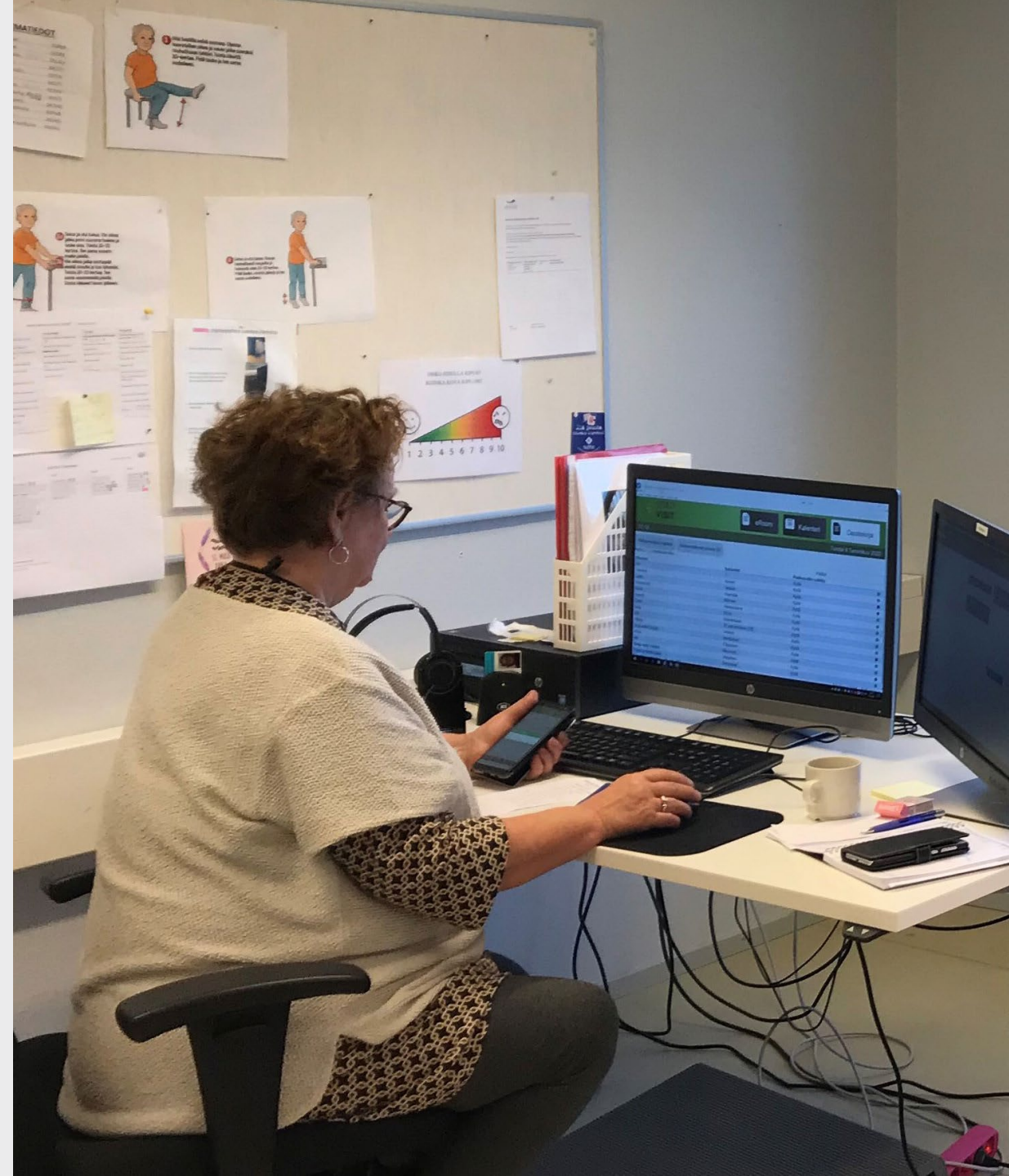
Effects and potentials

— Reduced environmental impacts

— More flexible solutions and increased access to care

— Increased quality of care

— Avoided expenditures

— Increased quality of life of patients and relatives

Future potentials

— The future use of Artificial Intelligence is considered to possess huge potential
  - Forecasting future changes in a customer's health status would enable a more efficient use of preventive care services
  - Activity sensors could be used in a more efficient way within the home care

— Creating a holistic customer data management system

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Thank you!

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