



Transforming the Nordic Welfare Regime – Tracing Friction in Introducing Welfare Technology

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Abstract

Based on a thematic content analysis of 63 key policy documents from the five Nordic countries, we discuss national strategies about introducing welfare technology to care for older persons. We argue that the Nordic care regime is a central research context in two senses: 1) the tradition of strong states and extensive social rights, and 2) the transformation of welfare states through marketisation and digitalisation, which also underpin welfare technology policies. We contribute to care policy research by contrasting the Nordic strategies and definitions and by identifying friction emerging within and across them. Our analysis shows that, while the overall image of WT policy is rather similar between the Nordic countries, the Danish, Finnish and Norwegian policy documents show signs of the earliest implementation. While the rest of the countries have implemented pilot-based, regional approaches, Denmark has seen a more centrally driven development. Our analysis also identifies friction in the welfare technology policies, portrayed as overly optimistic expectations; contested national rollouts; and financial resources designated for pilots and acquisition but not for maintenance costs. We argue that the notion of friction may support inter-stakeholder communication by providing cues to and making sense of the complexity of welfare technology innovation.

Practical Relevance

- The overall image of WT policy is rather similar in all five Nordic countries.
- National-level rollouts of WTs in Denmark stand in contrast with the more regional policy implementation in the other Nordic countries.
- National and cross-country frictions have emerged when introducing WT, including excessive optimism, contested national rollouts, financial support for acquisition of WT but not of its maintenance costs.
- The analytic notion of frictions may support inter-stakeholder communication by providing cues to and making sense of the complexity of WT innovation – especially in a rush for AI-enhanced technologisation.

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Introduction

In Denmark, Finland, Iceland, Norway, and Sweden (alphabetical order), as in many other parts of the world, the population is ageing. The demographic change will reach its peak in the coming decades and bring about many challenges, including an increased pressure on social and healthcare services. The scenario projected through policy papers and public reports across the Nordic countries is of a coming crisis in health and social care delivery, caused partly by increased demands for services, but also by a lack of personnel. Different measures have been launched to meet these challenges. Older people are, for example, expected to live longer at home and take more responsibility for their own health and illness and thus reduce the need for services.

As part of this shift in healthcare service delivery, technology plays an increasingly significant role. The concept of ‘welfare technology’ (WT) was introduced in the Nordic countries at the beginning of 2010s, encompassing a range of different digital and technical service solutions with a primary target-group being old persons in need of care services. A common feature of WT is that they enable care at a distance, i.e. services such as medicine handling, control of a person’s whereabouts, safety or follow-up of chronic illness from a remote location (Mort et al., 2003; Oudshoorn, 2009; Pols, 2012). Telemonitoring refers to digital devices to collect and transmit patient health data to healthcare providers from a distance. This allows for ongoing health management, especially for chronic conditions like COPD (Nickelsen & Pols, 2024). International literature discusses similar services in terms of assistive technology (Bryant et al., 2010), telecare (Procter et al., 2016), telehealth (Doughty et al., 2007), and e-health (Ahern et al., 2006).

The purpose of this article is to compare the Nordic countries' WT policies by clarifying (a) *what WT definitions and strategies have been implemented in the Nordic countries* and (b) *what friction emerges in relation to these strategies*.

In Nordic care policy, WT is often envisioned to lead to a new and better form of retrenchment, promising care quality, empowerment of care receivers, and a good working environment for informal and formal care for older people. As a political answer to increasing care needs, WT has become a “new mantra for reforming the Nordic public health and social care” (Kamp et al., 2019, p. 1), referring to a “digital transformation and system-wide approach beyond a single assistive technology” (Frennert & Baudin, 2021, p. 1220). WTs are imagined to mitigate the widening gap between a growing population in need of care and the limitations of human and financial capacity of the welfare states. In an editorial article, Kamp et al. (2019) discuss WT as it appears in the Scandinavian countries. Predominantly from a Danish perspective, they conclude that the differences in imaginaries and strategies for WT will have noticeable implications for care work. Together with other reform initiatives like coproduction, rehabilitation, and user-involvement, WTs aim at enabling a change in the role of the clients/patients, stressing their resourcefulness and potentials and encouraging individual responsibility and self-care. Moreover, in a recent broader report, The Nordic Welfare Centre compares the WT strategies in the Nordic countries (Lindberg, 2023). Drawing on interviews with managers and politicians and analysis of national policy papers, the report states that in four Nordic countries the state has accelerated the introduction of WTs especially in care for older people through economic initiatives between 2017–2020. In terms of national investment, Iceland is the exception. However, currently development work is underway in Iceland as well (Iceland's Parliament, 2023).

While the aforementioned literature has illuminated and compared aspects of Nordic WT policies, comprehensive research on WT definitions covering all five Nordic countries' policies from their early phases is lacking, as well as a deeper analysis focusing on what friction Nordic WT policies implicate. Through an integrated and comparative analysis of Nordic WT policy documents, our article aims to fill this gap. We argue that highlighting friction can both support inter-stakeholder communication and function as an important analytical contribution about the hitherto inertia of WT adoption of the Nordic countries.

In the following, we will first give a background for the socio-political development that has accommodated the turn to WT in care for older people: the Nordic welfare state and its transforming care regime and care ideals. After that, we will discuss our analytical approach to WT policies. Our analysis first outlines definitions of WT and national strategies for introducing WTs across the Nordic countries. Second, we discuss friction regarding Nordic WT policy about WT definitions, hype and optimistic expectations, centralised versus decentralised approaches, the role of maintenance costs and care workers' voice.

The Context of the Study: Transforming the Nordic Care Regime and Its Ideals Through Digitalisation

The Nordic care regime

Policies rallying for digitalised health and care services are common in European countries (Valokivi et al., 2023). The digitalisation of public services in the Nordic countries is the most extensive in Europe, with Denmark, Finland, Norway, and Sweden repeatedly ranking the highest (European Commission, 2022). This is due to “digital first” (Olsson & Viscovi, 2023) and “digital by default” (Schou & Pors, 2019) policies prioritising and relying on digital services in care provision with an aim to increase the efficiency, transparency, flexibility and availability of care services, and to tackle challenges brought by demographic ageing (Neven & Peine, 2017).

Recent WT policies in the Nordic countries may not be fully understood without understanding the changes in the Nordic welfare state, both through the idea of a Nordic care regime and through the transformation of its ideals. The most central characteristic of the Nordic care regime has been the principle of universality: equal inclusion based on legislated rights, public (tax-based) funding, public provision and comprehensive and needs-based usage of care services. Equal access to efficient care services has been a universal social right, and “a public good among other tax-financed services” (Anttonen & Karsio, 2017, p. 232). Universalism has led to an extensive system of public care services, which family ties and close relations only complement (Bettio & Plantenga, 2004; Dahl, 2012).

Although sharing the ideal of universality, the Nordic countries are also subject to differences, which has raised the question of whether there exists a unified Nordic care regime. For example, in Finland, there is today a mixed system of public, private, third sector and individual care providers with exceptionally high client fees (Aidukaite et al., 2022; Zechner et al., 2022). While Denmark and Norway exemplify universality with a tax-financed long-term care system, in Finland and Sweden there have been substantial reforms towards decentralising social and healthcare, with an increase of private actors in care provision and a weakening of the universalist principles in care services (Aidukaite et al., 2022). In general, Since the 1980s–1990s, the Nordic countries’ care policies have emphasised order – executer models, consumer choice, competition between services, outsourcing from the public to the private sector, infiltration of market logics to the public sector and commodification of care (Aidukaite et al., 2022; Anttonen & Karsio, 2017; Anttonen & Meagher, 2013; Moberg, 2017). Furthermore, in the public sector, “marketisation of care” (Brennan et al., 2012; Szebehely & Meagher, 2018) has been connected with promises of increasing efficiency and service user empowerment.

The shifts in the Nordic care regime in the 21st century are related to the growing significance of WTs in care policy. Digitalisation and care regime reforms have worked in tandem, as vast digitalisation processes started in the 1990s (Schou & Pors, 2019). The entwinement of the transforming welfare state and digitalisation can be examined from social and health policy as well as user perspectives, both of which highlight how digitalisation is not separate from marketisation, rather one forces the other, since different WTs rely on digital services and infrastructures. For example, medicine dispensers and surveillance systems do not function without reliable access to wireless internet networks. Thus, marketisation is connected to digitalisation, as public service providers rely on private, entrepreneurial actors who develop and sustain WT. This cooperation has led to the Nordic states being the collectors, providers and users of health-related data in the international health data economy (Tupasela et al., 2020).

Therefore, the Nordic care regime is central as background for examining and comparing WT policy in two senses. On the one hand, the tradition of strong states and extensive social rights is to the point of WT policy. On the other hand, the transformations of welfare states, such as marketisation and digitalisation, affect and push forward WT policies.

Welfare technology, care ideals and the welfare state

Several studies have focused on the in-practice implementation and use of WTs, especially from ethical perspectives. WT is expected to realise many different and sometimes conflicting values and ideals (Lydahl & Davidsson, 2024; Nickelsen & Pols, 2024). While research concludes that older persons might be able to attain a feeling of togetherness and affection via WTs (Åkerlind, 2017), other research warns that core values are at risk when introducing WTs into care practices (Frennert & Östlund, 2018; Hämäläinen, 2024). WTs may, for example, embrace attractive alternative dependency situations for both care providers and care receivers (Nickelsen & Simonsen Abildgaard, 2022). Also, research shows that the use of social alarm WTs may enhance independence and safety while neglecting other key values such as the aspiration for a stress-free working environment and functionality through design bias that excludes possible users (Lydahl, 2023). This mismatch of values and aspirations is possible due to the ways in which different actors (dis)involved in the design, implementation and use of WT have different views and perspectives influenced by their respective professional norms and knowledge traditions (Hasselblad, 2021). WT integration is thus inherently complex, as using WTs is based on the care workers' situational and personal interpretation of the technology and the quality of care (Chang et al., 2022), which also increases the temporal complexity of caring (Hämäläinen et al., 2024; la Cour & Højlund, 2019).

From the service user perspective, WT policy may enforce the principles of welfare states by securing access to public services in loosely populated rural areas, and thus equal services in line with the universality principle (Valokivi et al., 2023). Nevertheless, digital divides related to access, usage and outcomes persevere in WT services (Nasjonal kommunikasjonsmyndighet, 2023; Olsson & Viscovi, 2023), thus undermining the universalistic principles of the Nordic care regime. Digital divides may sustain a 'choice-universalistic' care model that emphasises individual choice and freedom, but also individualised responsibilities in the digitalised care provision system (Moberg, 2017). Emerging divides may lead to further exclusion of citizens "at the fringes of the welfare system" (Schou & Pors, 2019, p. 465), possibly meaning that those who are neither able to pay for private services nor have informal or familial resources to respond to their care needs may be excluded (Szebehely & Meagher, 2018; Valokivi et al., 2023).

Data and Methodology

The *primary data* consists of 63 policy papers and governmental reports from Denmark (13), Finland (13), Iceland (11), Norway (13), and Sweden (13) (see appendix 1). The data were chosen for analysis based on their overall relevance and representativeness of each country's WT policy. We focused on documents published by key governmental institutions such as ministries, regional authorities, and government-led research institutions in the different Nordic Countries between 2008 and 2023. This timespan reflects that these were the formative years for defining the first WT policy and shaping the adoption and use in care practice in all five Nordic countries. The documents were analysed by conducting data-driven thematic content analyses (Braun & Clarke, 2006), paying attention to WT definitions, overall policy progress and friction.

This paper is also the outcome of a Nordic network funded by NOS-HS called "Reassembling Care for Older People (RECOPE)". The network consists of early career and senior researchers from all Nordic countries. To gain diverse insight into each country's WT practices, RECOPE hosted three workshops under the topics of automatisisation of care (Copenhagen, May 2023), care relations (Reykjavik, September 2023), and the home as site of care (Jyväskylä, May 2024). Notes from discussions at the workshops provided *secondary data* with which we were able to support and deepen our analysis of friction concerning Nordic WT policies, adoption, and use

in care practice. An important aim of the workshops was to get insight into the role of WT in care services for older people, from various perspectives. This involved taking a broad approach, inviting not just researchers in the field but also several affected stakeholders. Altogether, more than 100 stakeholders attended the workshops, representing groups such as care providers, care home managers, physio- and occupational therapists, nurses, technology developers, representatives from user organisations, family carers and researchers. Since care services differ across the five countries, as do applied WTs, we debated not only differences among care practices but ultimately among welfare models. Between the workshops, the authors went through National policy papers and seminal articles and explored both grey and peer-reviewed literature concerning national WT strategies.

In our analysis, we first focused on how WTs are defined in the national policies and how WT policies have proceeded and progressed in each country during the 2010s and 2020s. Additionally, we concentrated on friction with regard to WT policies with a comparative angle between countries. Anthropologist Anna Tsing defines friction as a dynamic force:

Rubbing two sticks together produces heat and light; one stick alone is just a stick. As a metaphor, friction reminds us that heterogeneous and unequal encounters can lead to new arrangements of culture and power (Tsing, 2005, p. 5).

Scholars in Science and Technology Studies (STS), further emphasise friction as “places where dominant images lose their smoothness and become multiple” (Downey & Zuiderent-Jerak, 2017, p. 227), or when “projects with universal aspirations encounter actors and institutions with different ideals and practices” (Nielsen & Jensen, 2013, p. 64). STS often highlights these “frictions that dominant images of science and technology hide” (Downey & Zuiderent-Jerak, 2017, p. 227). When science, technology, and policy are tense, or transferred across different contexts, the friction tends to become more visible. Correspondingly, we directed our attention to friction both while analysing the documents in between workshops and during stakeholder discussions at the three workshops.

Results

Definitions and strategies of WT policy

Despite its 15-year history, the concept of WT is ambiguous and loosely defined, as exemplified by The Nordic Welfare Centre (2024):

[welfare technology is] all technology which in one way or another improves the lives of those who need it. The [welfare] technology is used to maintain or increase security, activity, participation or independence for people with a disability or the elderly [sic].

However, there are important similarities, path dependencies and differences among the Nordic countries’ definitions, governance and ways of adopting WT.

In *Denmark*, WT is defined as technological services and products aimed at the social and health sector that can free up labour, lighten the workload for staff and increase quality and safety for patients and citizens (Kommunernes Landsforening, 2020). The term (velfærdsteknologi) appeared for the first time in September 2007 (Højland, 2007). The notion of WT was mentioned several times in the government basis for the new social democratic led government in 2011 (Regeringen, 2011). The Welfare Technological Fund was established the same year to drive the demonstration and dissemination of WT. Since then, there have been many policy papers on the use of welfare technology in Denmark (Lunde et al., 2017; Teknologisk Institut, 2023). The municipalities’ financial agreement for 2014 launched a joint effort for national dissemination of ‘mature’ WTs (Regeringen & KL, 2013). In 2014 KL established ‘Centre for Welfare Technology’ with the task to provide yearly reports and outcome measures in regard to the dissemination of these four technologies on a national scale 1) lifting technologies, 2) washing toilets, 3) eating robots and 4) diverse aids (a residual category of various hitherto less used technologies) (Kommunernes Landsforening, 2018). Additionally, a large-scale project Telecare Nord was initiated to advance digital monitoring of measurements from a distance, for citizens with chronic obstructive pulmonary disease (COPD) (Christensen, 2018; Hæsum, 2015; Lilholt, 2016; Udsen, 2016). A national rollout of COPD telemonitoring was decided by the Danish government in 2018. Data security and political controversies related

to financing, however, implied that this solution is still not in operation. Correspondingly, there have been several major aims of rollout in all the municipalities in Denmark. This proactive Danish approach differs from what we see in the other Nordic countries. Nevertheless, the use of WT in the Danish municipalities include WTs used in the other countries.

In *Finland*, WTs became visible in *Quality Recommendation on Older People's Services (QR)* issued by the Ministry of Social Affairs and Health (STM) in 2008, recommending safety bracelets and surveillance technologies (STM, 2008). However, in contrast with other Nordic countries, the term WT has not been consistently used. Instead, terms such as “health technology”, “care technology” or “gerontechnology” have been used. In Finnish WT translates into “hyvinvointiteknologia”. “Hyvinvointi”, which connotes “wellness” rather than the word “welfare”, thereby easily refers to, for instance, activity bracelets and massage chairs. This incoherency may also reflect a history of more ambiguous policy steering in Finland (Pekkarinen and Melkas, 2019, p. 13). Nevertheless, during the 2010s, the Finnish WT policy has been implemented on an extensive level typical of the other Nordic countries. Although, in contrast with Denmark, and similar to the other Nordic countries, Finnish WT implementation has varied significantly by region (Hammar et al. 2018). Finnish WT policy has aimed for “citizens' active involvement in their own wellbeing through technology use” (STM, 2015), controlling the increase in public expenditure and creating new opportunities in business and export (STM 2018). Similar to the other four countries, reducing labour costs has been a driving force, since technologies may support logistics, safety and demanding tasks (STM, 2017, 2020). Frequently used technologies in Finnish care of older persons include video calls, electric patient lifts, safety alarm bracelet systems, safety phones and movement sensors (Karhinen et al. 2021). In recent years, the emphasis has been on “digital self-care” and supporting home-dwelling as long as possible with medicine reminders, video calls, movement sensors and safety floors (STM, 2017; 2020; 2024; THL, 2023). There have also been policy initiatives aiming for extensive utilisation of AI and robotics in the care of older persons (STM 2018, DigiFinland 2025).

In *Iceland*, the concept WT (velferðartækni) also emerged around 2015 when the government published a document under the title Innovation and Technology in Social Services (Ministry of Welfare, 2015) in addition to focusing on e-health technology (Ministry of Welfare, 2016; 2018). Like Sweden, Iceland's policy from 2015 provided a vision of WT as enhancing independence, active participation, ability and quality of life among older persons, while also supporting caregivers (Gudmundsson, 2015). In subsequent policy documents, WT encompasses technologies designed to support independence, daily activities and safety (Ministry of Health, 2018; Ministry of Welfare, 2016; 2018; 2020; Parliamentary decision, 2019). Although WT was new, social alarms had been used in Iceland for over 20 years, reimbursed by Iceland Health, a state-run organisation that covers various healthcare costs. The government has not promoted the adoption of any particular WT but has supported start-up firms and the municipalities in their projects, often small-scale pilots (Reykjavik Welfare services, 2022). In recent years, the emphasis has been on the introduction of medicine dispensers and tablets used for video consultation. Recent policy documents reflect ambitious plans to introduce WT in the coming years in caring for older people (Ministry of Health, 2019; 2021;) and Ministry of Health and Social Affairs (2023).

In *Norway*, the notion of WT was introduced through the report “Innovation in the care services” (Ministry of Health and Care Services, 2011). It says: “WT refers to technological assistance that contributes to increased safety, security, social participation, mobility, and physical and cultural activity” (NOU 11:2011, p. 99, translation by author H.T.). Subsequently, a state-financed National Program for WT implementation (Nasjonal velferdsteknologiprogram/NWTP) was announced in 2013, targeting older persons receiving home-based services. The NWTP was a cooperation between the Directorate of Health, the Norwegian Association of Local and Regional Authorities (KS) and the Directorate of e-health. NWTP funds were allocated to follow-up research aiming to “document gains”, resulting in three “Gains realisation reports” (Gevinstrealiseringsrapport) in 2015, 2017 and 2021. The reports pointed out several gains in relation to “expenses saved” and “better services” for the

service providers, and to experiences of “better quality of life” and “increased safety” for service recipients and family carers. Moving from pilot projects to care practice has however proved difficult. 90 out of 357 municipalities have still not implemented any WT except for safety alarms (Helsedirektoratet, 2022). The same statistics show that the total number of persons using WT (including safety alarms) as a part of municipal service provision has increased from 99 616 in 2018 to 125 286 in 2022. In 2023, a new Health-technology program (HTP) was launched. This new program replaced the NWTP and entailed a slight change in focus from WT implementation to also include digital home monitoring services and electronic journal systems. The main target user group of HTP is persons with chronic illness living at home and entails new forms of collaboration between specialist health care services, GPs and municipality services.

In *Sweden*, the aim of introducing and using WT is to “improve the quality of life for older people and people with disabilities in various ways so they can participate in the democratic society and benefit from society’s support in order to experience security, participation and independence, participation in society” (Socialstyrelsen, 2024). The Norwegian and Swedish definitions are similar in the sense that they are broad and do not specify certain technologies as WT technologies. In Sweden, the Ministry of Health and Social Affairs, along with the Ministry of Enterprise and Innovation, oversee the development, coordination, and implementation of WT. Leading this effort are the National Board of Health and Welfare and the Swedish Agency for Participation, responsible for monitoring and guiding WT advancements. Since 2014, they have published annual reports on e-health and WT usage in municipalities. Initially, in 2010, the government allocated stimulus funds for eHealth and welfare services without specifically mentioning WT. By 2012, this support doubled to SEK 40 million, aiding in regional coordination, technical infrastructure development, and national information structures. Stimulus funds have steadily increased, with SEK 350 million allocated to municipalities in 2018. In January 2020, a new agreement between the government and the Swedish Association of Local Authorities and Regions provided an additional SEK 168.7 million to enhance digital care services for older people. Consequently, WTs have seen increased utilisation in Swedish care services for older people. Unlike Denmark, Sweden has not promoted the adoption of certain technologies. Instead, like in Finland, Iceland and Norway, municipalities are autonomous in deciding which technologies to implement. WTs are procured at the municipal level and prescribed to individual users by social workers. The most used WT is the social alarm, installed in users’ homes or in special houses offering twenty-four-seven care, to call for help in emergencies. Other commonly used WTs include digital supervision technologies like security cameras, sensor alarms for fall prevention.

Comparison of Friction Based on WT Policies

Next, we will identify some similarities and differences among the Nordic countries’ WT strategies and plans, whose development we have sketched throughout the last 10-15 years. In the following, we will focus on the friction about definitions, hype, and ambiguity of rollouts. We will also focus on the role of maintenance costs and how the care providers’ perspective has been included in the policy.

Friction about definitions

The definitions of WT are broad in the Nordic countries, of which Denmark’s and Norway’s policies are good examples. WT simultaneously refers to both services and products in the social and health care sector. The overall goals of WT introduction are widely shared in the Nordic countries. The goals are improving care services, while also decreasing their demand, freeing up labor, mitigating the workload of care providers, providing security and independence and even active citizenship (Nickelsen, 2019b).

Defining WT resembles the ageing-and-innovation discourse identified by Neven and Peine (2017) and its troubles. This discourse builds on the rhetoric of a ‘triple win’, and on the claim that society wins when problems in care provision are solved, the economy wins when technology companies flourish, and care receivers win when they can live at home safely and

longer with WTs. This triple win is also evident in the Nordic definitions of WT. However, the ageing-and-innovation discourse has three problems: first, the discourse legitimises investment in technology in general and thus gives limited space for distinguishing between useful and useless technologies. Second, it presupposes a negative understanding of ageing, where care receivers are depicted as “vulnerable old people who need our help”, in contrast with the positive view of ageing that is held by many older people themselves (Neven & Peine, 2017, p. 8). Third, the discourse generates a strong rhetorical device and moral focus that makes it difficult for critics to speak up. The ageing-and-innovation discourse thus risks hampering the provision of useful WTs that fit into the daily lives of older people (Neven & Peine, 2017, p. 1).

Another friction related to definitions is the ways in which WTs cover both older people and people with disabilities. This produces some conflicts in the national policies. In Denmark and Norway, WT is not exclusively for older people; however, it is in relation to this group the WT agenda has found a foothold (Fredskild & Dalkjær, 2017; Nielsen et al., 2016). The boundary between WT and technical aids is not sharp, as some technologies can be prescribed to the individual both as WT after a decision by the Social Services Act in Sweden and as a technical aid by the Health and Medical Care Act. The same is the case in Denmark, while in Iceland both technical aids and WT are funded by Iceland Health, based on governmental regulations. In Norway, technical aids are provided by a state-financed system which is separated from WT allocation. While WTs may be service solutions, technical aids are, in many cases, provided without being linked to service provision, except for Iceland. For example, when you need help with medication, you get an electronic medicine dispenser (WT) instead of having the home care nurses come several times a day. The medicine dispenser becomes the service that the municipality provides to the older person (Thygesen, 2019, p. 27). For technical aids it is different. Many technical aids (as also with WTs) need individual adjustments (such as wheelchairs) to function, but they are not services as such in themselves. In Finland, the situation is like that of the Scandinavian countries, however, the Finnish legislation guarantees the right to receive care-related technical aids through the Disability Services Act, which limits the legal right to technical aids such as wheelchairs and walkers for people with disabilities. In part, the WT policies exemplify how the boundaries between disability and age-related care needs are becoming increasingly blurred (Era, 2021). This has implications regarding who has rights and access to WT and who pays for them. Additionally, Finnish WT policy has been implemented by regional allocation of funds for, for instance, safety alarm bracelets and systems, monitoring solutions, video calls, electric bed lifts, and so on. Therefore, access to WT varies regionally but is based on home care or residential care clientship and filling RAI (resident assessment instrument) assessed needs criteria throughout the country.

Hype and optimistic expectations

Broad definitions of technology also tend to produce high expectations, which is evidenced by the centrality of hype in WT policies. A recent analysis concerning Finland shows that policy documents on ageing and care present WT as overly positive (Sjögren et al., 2023). Risks associated with the rapid and widespread introduction of WT are not addressed, and increased ethnic diversity and other minorities among older people are largely overlooked. Moreover, in the Nordic countries, there is a distinctive and troubling regime of hype in WT policymaking (Jaakola, 2023; Kamp et al., 2019), which implies uncritical promises and exaggeration of opportunities and assets as well as the circulation of unrealistic expectations. The focus on gains realisation in Norway’s policy assessment is a good example. The focus on hype blurs the ways in which the introduction of WTs can also cause ethical dilemmas and contradictions (Frennert, 2018; Greubel et al., 2021; Jaakola, 2023; Lydahl, 2023; Nickelsen & Simonsen Abildgaard, 2022).

The presence of high expectations in Nordic WT policies has to do with the fact that hype is important for policymakers, technology start-ups and entrepreneurs in gaining public attention and attracting investments. A good example of hype is the government led diffusion of feeding robots in Denmark. These robots passed quantitative and qualitative trials carried out at Danish Technological Institute. Correspondingly they were recommended by the authorities to be purchased by all Danish municipalities (Gaedt, 2013). Soon after, they appeared to be useful

only for very few clients/patients (Nickelsen, 2013, 2019a). In line with this, the Ministry of Health and Social Affairs in Finland (STM, 2017) recommended the extensive utilisation of care robots in 2017 without any empirical evidence on their benefits. These kinds of robots are currently hardly commercially available or feasible. Rather, they ought to be seen as prototypes that have been in the making for decades without significant and convincing advances (Van Aerschot & Parviainen, 2020).

Contested national rollouts

Hype puts the focus on saved expenses, improvement of services and increasing health benefits, but not on the contradictions that WT can raise and certainly not on the care values that they downplay. Despite the hype, there are, as mentioned, difficulties in the utilisation of WTs in municipalities and other regional governing bodies. In general, there is a strong focus on WT implementation in all the Nordic countries. In Finland, Norway, Iceland and Sweden, the implementation and funding has been delegated to regional or municipal bodies, while Denmark has adopted national rollouts of selected WTs although it is important to notice that it is Local Government Denmark, i.e. the municipalities' own interest organization, that drives this process to improve and streamline their own services. Two major national initiatives have driven this Danish strategy: the local government Denmark's mandate for the dissemination of four robust technologies across all municipalities, and the nationwide, cross-sector rollout of COPD telemonitoring on a common platform. However, this approach appears to have been overly optimistic about achieving consensus among central government agencies, municipalities, and hospitals. It seems to have overestimated the capabilities of the technology while underestimating the potential controversies and differing values and accountability systems among institutions and professionals.

While the central Danish institutions and municipalities believe that WT can help the labour shortage and provide financial savings; an increasing number of municipalities are troubled by the fact that financing and resources hamper adopting and developing relevant WT services. This is documented by the 2023 edition of the annual survey of the municipalities' use of WT (Teknologisk Institut, 2023). Thus, the Danish approach may be characterised by an enthusiastic start and a few national rollouts experiments to avoid time-consuming pilot projects, tests and trials. These rollouts have however not exactly been successful. Washing toilets and eating robots are only used sporadically (Dahler, 2018; Nickelsen & Simonsen Abildgaard, 2022). Similarly, in both Norway and Sweden the use of WT is much lower than anticipated, despite the extra funding for 10 years (Regeringen et al., 2022). The governments in Finland, Sweden and Iceland have not as actively promoted the introduction of specific WTs. This has meant long-winded testing and trials with many results but without an overarching vision. As a response to this challenge (and others), Finland recently implemented a structural reform by shifting the governance of social and healthcare from over 200 municipalities into 21 Welfare Services Counties, expecting that they are more apt to also take on the challenge of governing, prioritising and providing the resources that WT implementation takes. Accordingly, in Iceland, Norway and Denmark, smaller municipalities struggle with making progress in relation to WT implementation due to a lack of employees and financial resources. COPD telemonitoring is for instance expensive and thus difficult to maintain in a municipality where perhaps 20-40 citizens request this service.

No coverage of maintenance costs

In contrast with the Danish national rollout strategy, various obstacles have hindered moving from restricted pilot projects to full-scale, continuous operations in other Nordic countries. For example, in Sweden, government stimulus funds are limited to covering the initial purchase of WTs, excluding long-term costs such as maintenance, operating expenses, and ongoing training. As a result, a large proportion of WTs in Swedish municipalities remains stuck in the pilot phase, slowing broader implementation (Socialstyrelsen, 2021, p. 14). Some argue that this is due to stimulus funds being restricted to technology purchases without addressing the associated long-term management costs (Socialstyrelsen, 2023, p. 11). This problem is linked to policy assumptions embedded in the definition of WT, which promises more efficient services. As this

efficiency is taken for granted, funds for operational costs are often overlooked in several Nordic countries, creating a significant barrier to sustaining continuous WT operations. Since 2017, Norway's national program aimed to transition from testing solutions in pilot projects to integrating them into everyday care within municipalities. However, this shift has been more challenging than anticipated, particularly for smaller municipalities. These municipalities often have only a few users of certain WT, raising the question of how much they should invest in developing services for such a limited user base (Directorate of Health, 2020). In Denmark, despite considerable efforts, the transition from WT pilot projects to implementation in everyday operation has been difficult due to conflicting goals across the healthcare sector. Different institutions and sectors have varying aims, care values, and accountability systems. For instance, while Danish municipalities are highly motivated to develop app-based services for chronically ill citizens to reduce extensive costs for hospitalisation, private practitioners lack this incentive. They are compensated with a lump sum on a per-patient basis, giving them little incentive to do more than required. This discrepancy in performance systems creates challenges and remains a key obstacle to the successful integration of WT across institutions and sectors.

Care workers and their perspectives

The estimates of replacing care workers with WT are argued to be too optimistic (Wright, 2023). There are indications that the ongoing digitalisation of care practices for older people in the Nordic countries has led to an increase in the time spent focusing on technology and thus time has been taken away from traditional care work (Frennert et al., 2023; Lipp, 2019). This relates to the view that core ethical values of care for older people are at risk if WT is applied uncritically and in a top-down manner (Chevallier, 2023; Hämäläinen, 2024). This appears however to be in contrast with the development in Iceland, where the public discussion around the benefits and possible shortcomings of WT has been minimal, and by scrutinising policy documents, we were not able to identify frictions.

In Sweden, WT policies lack an employee perspective. The Swedish Municipal Workers Union highlighted this in 2018, and the National Board of Health and Welfare acknowledged it in 2019. In 2020, they further specified that WTs may be divided into two distinct areas: technologies for safety and independence for the individual, and technologies providing support to staff and caregivers. Yet, the Swedish governmental report published in 2020 did not include an employee perspective in its definition of WT. This is different among the Nordic countries. In Denmark, aims of working environment improvement for the care providers have been probated from the beginning as part of what is sometimes argued to be the quadrable win connected to WT; that is quality of care, efficiency, working environment for care providers and developing a new industry and business around WT (Aaen et al., 2018). In Finland, research shows an increase in the amount of time spent with technology in care work related to older persons, which is experienced as a burden by the care workers (Karhinen et al., 2021; Rytönen, 2018). The two major care professionals' unions in Finland, The Finnish Union of Practical Nurses (SuPer) and The Union of Health and Social Care Professionals in Finland (Tehy) have expressed their concerns about technologisation of care of older persons, however, care technologisation is often experienced by care professionals as being inflicted in a top-down manner (Rytönen, 2018).

Conclusion

In this paper, we have analysed definitions, strategies, and frictions concerning WT policy in the Nordic countries. Our comparative analysis makes two key contributions.

Our first contribution is the systematic comparison of WT definitions and strategies as portrayed in each of the five Nordic countries' policy documents in a way that both confirms and extends past research on Nordic WT policy. For example, we reassert Kamp et al's (2019) overview concerning the three Scandinavian countries that Denmark and Norway have been early proponents of WT policy and implementation, and that the Danish WT policy has been centralized in the sense that the municipalities' own interest organisation (Local Government Denmark) has consistently argued that all municipalities ought to adopt the same technologies

at the same time to learn and succeed. However, our analysis arrives at a more comprehensive outlook, both methodologically and by including Finland and Iceland in the analysis. Regarding the comparative study on Nordic WT policy by Lindberg et al. (2023), we covered a broader temporal scope of Nordic WT policy to include the early definitions and strategies, as well as friction as a deeper analytical lens through which to assess WT policy.

Therefore, we present an extensive outlook on Nordic WT policy in the first decades of the 21st century. Our analysis suggests that WT is imagined as a solution to three problems concerning the care of older people in the Nordic countries. First, as a solution to secure the activity, participation and independence of older people who need or are at risk of needing healthcare services. This can be categorised as a citizen challenge. WT policy aims to secure older citizens' rights to be active, independent and to participate in their own care as well as in social activities. However, individual empowerment through WT implementation also plays into shifting care responsibilities from professionals situated in the formal care sector to older persons themselves, as well as their next of kin and other informal actors. Second, WT is imagined as a solution to an efficiency challenge. WT is imagined to enhance care services for older people by optimising resource utilisation, improving quality and efficiency, and promoting sustainable management of human resources through better work conditions (Kohlen, 2011). Third, WT is imagined as a solution to a care challenge by freeing up labor and mitigating the workload for staff. By letting WTs perform routine tasks, the expectation is that care workers will have more time for social relations, although the research has yielded ambiguous results with regard to this issue (Karhinen et al, 2021).

However, there are also significant differences in approaches between countries, which are partly related to differences in post-expansive welfare state trajectories. For instance, Denmark's ideas of simultaneous rollouts differ substantially from the more scattered and regional approaches in the other four countries. Therefore, we call for future research concerning both the quantitative and qualitative comparative research settings aimed at investigating the impacts of such differences for care work and for older persons' everyday experiences.

Our second contribution is that thinking about WT policy and implementation in terms of friction can support inter-stakeholder communication by providing cues to make sense of the complexity of WT innovation. We share the view that WT is best approached as an umbrella concept (Rostad & Stokke, 2021) that refers to services, products and technologies related to care. However, we also want to highlight the importance of understanding the friction caused by ambiguity of WT definitions, as WT can refer to technologies ranging from robots to safety alarms to rather simple assistive technology. For instance, while different safety alarms have been used for decades in the Nordic countries, eating robots are WTs promised to be fully available for service use only soon. These, along with a plethora of other WTs, are not very similar technically, practically or in terms of their everyday and ethical implications. Thus, by referring to both the practical and the speculative at the same time, current WT policies may produce both ambiguous and unrealistic expectations.

Concerning friction, the challenges of developing, upscaling, and sustaining emerging WTs pose a significant threat to the vision of digital transformation of welfare service delivery in caring for older people in the Nordic countries. Over-optimism regarding what WTs can achieve, and under-estimation of the complexity of WT implementation and diffusion are common themes across all the Nordic countries and strategies. This has crucial implications because it creates unrealistic expectations, not least in cases where significant amount of money is spent on technologies that may not end up in broad use in the long run. The policy document data, as well as the stakeholder workshop discussions, revealed rather fragmented policy developments characterised by unresolved discussions and implications for practice. The friction manifest in top-down directed WT policy also runs a risk of neglecting care professionals' profound everyday insight on aspects of good care, thereby also neglecting older people's needs (Östlund, 2015). Therefore, we propose that a stronger focus on friction may generate ideas for possible interventions within policy, as innovation processes continue in health and social care in all of the Nordic countries.

Conflicts of Interest

There are no conflicts of interests.

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References

- Aaen J, Nielsen, J A & Elmholdt K T (2018). 10 år med velfærdsteknologi: Strategi og praksis. *Samfundslederskab i Skandinavien* 33(3), 236–259.
<https://doi.org/10.22439/sis.v33i3.5552>
- Ahern D K, Kreslake J M & Phalen J M (2006). What is eHealth (6): perspectives on the evolution of eHealth research. *Journal of medical Internet research* 8(1).
<https://doi.org/10.2196/jmir.8.1.e4>
- Aidukaite J, Hort S & Ainsaar M (2022). Current trends in social welfare policies toward the older people in the Baltic and Nordic countries: an explorative study. *Journal of Baltic Studies* 53(2), 147–167. <https://doi.org/10.1080/01629778.2021.1998166>
- Anttonen, A & Karsio O (2017) How marketisation is changing the Nordic model of care for older people. In Martinelli F, Anttonen A and Mätzke M (eds), *Social Services Disrupted*. Cheltenham: Edward Elgar Publishing, 219–238.
<https://doi.org/10.4337/9781786432117.00020>
- Anttonen A & Meagher G (2013) Mapping marketisation: concepts and goals. In Meagher G and Szebehely M (eds), *Marketisation in Nordic Eldercare*. Stockholm: Stockholm University, 13–22.
- Bettio F & Plantenga J (2004) Comparing care regimes in Europe. *Feminist Economics* 10(1), 85–113. <https://doi.org/10.1080/1354570042000198245>
- Braun V & Clarke V (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology* 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Brennan D, Cass B, Himmelweit S & Szebehely M (2012) The marketisation of care: Rationales and consequences in Nordic and liberal care regimes. *Journal of European social policy* 22(4), 377–391. <https://doi.org/10.1177/0958928712449772>
- Bryant B R, Bryant D P, Shih M & Seok S (2010) Assistive technology and supports provision: A selective review of the literature and proposed areas of application. *Exceptionality* 18(4), 203–213. <https://doi.org/10.1080/09362835.2010.513925>
- Chang F, Kuoppamäki S & Östlund B (2022) Technology scripts in care practice: A case study of assistant nurses’ use of a social alarm system in Swedish nursing homes. *Digital Health* 8, 20552076221089077. <https://doi.org/10.1177/20552076221089077>
- Chevallier, M (2023) Staging Paro: The care of making robot(s) care. *Social Studies of Science* 53(5), 635–659. <https://doi.org/10.1177/03063127221126148>
- Christensen, J K B (2018) The emergence and unfolding of telemonitoring practices in different healthcare organizations. *International Journal of Environmental Research and Public Health* 15(1), 61. <https://doi.org/10.3390/ijerph15010061>
- Dahl H M (2012) Neo-liberalism meets the Nordic welfare state—Gaps and silences. *NORA-Nordic Journal of Feminist and Gender Research* 20(4), 283–288.
<https://doi.org/10.1080/08038740.2012.747790>
- Dahler A M (2018) Welfare technologies and ageing bodies: Various ways of practising autonomy. *Rehabilitation Research and Practice*. <https://doi.org/10.1155/2018/3096405>
- Doughty K, Monk A, Bayliss C, Brown S, Dewsbury L, Dunk B, Gallagher V, Grafham K, Jones M & Lowe C (2007) Telecare, telehealth and assistive technologies—do we know what we're talking about? *Journal of Assistive Technologies* 1(2), 6–10.
<https://doi.org/10.1108/17549450200700012>

- DigiFinland (2025) Tekoäly hyvinvointialueilla: sosiaali- ja terveydenhuollon käytötapa-
ukset ja kansallinen edistäminen. Esiselvitystyön loppuraportti, maaliskuu 2024.
https://digifinland.fi/wp-content/uploads/2024/03/DigiFinland_tekoaly_loppuraportti_210324.pdf, accessed 9.10.2025
- Directorate of Health (Helsedirektoratet), 2020. «Omsorg 2020. Årsrapport».
<https://www.helsedirektoratet.no/rapporter/omsorg-2020--arsrapport-2020/statistikk/bruk-av-velferdsteknologi>, accessed 10.10.2025
- Downey G L & Zuiderent-Jerak T (2017) Making and doing: Engagement and reflexive learning in STS. In Felt U, Fouché R, Miller C A & Smith-Doerr L (eds), *Handbook of Science and Technology Studies*. Cambridge: MIT Press, 223–250.
- European Commission (2022) Digital Economy and Society Index (DESI) 2022. Available at <https://digital-strategy.ec.europa.eu/en/library/digital-economy-and-society-index-desi-2022> (accessed 28 January 2025).
- Era S (2021) Equality according to whom? Debating an age-related restriction in the upcoming disability legislation reform in Finland. *Journal of Aging Studies* 58, 100953.
<https://doi.org/10.1016/j.jaging.2021.100953>
- Fredskild, T U & Dalkjær D (2017) Velfærdsteknologi i sundhedsvæsenet (2. udgave. 1. oplag. ed.). Gad.
- Frennert S (2018) Lost in digitalization? Municipality employment of welfare technologies. *Disability and Rehabilitation: Assistive Technology* 14(6), 635–642.
<https://doi.org/10.1080/17483107.2018.1496362>
- Frennert S & Baudin K (2021) The concept of welfare technology in Swedish municipal eldercare. *Disability and Rehabilitation* 43, 1220–1227.
<https://doi.org/10.1080/09638288.2019.1661035>
- Frennert S, Petersson L & Erlingsdottir G (2023) “More” work for nurses: the ironies of eHealth. *BMC Health Services Research* 23(1), 411. <https://doi.org/10.1186/s12913-023-09418-3>
- Frennert S & Östlund B (2018) Narrative Review: Technologies in Eldercare. *Nordic Journal of Science and Technology Studies* 6(1), 21–34. <https://doi.org/10.5324/njsts.v6i1.2518>
- Gædt L (2013) Spiserobot til borgere med fysisk handicap. Velfærdsteknologi vurdering i Socialstyrelsens ABT projekt.
- Greubel C, Moors E H & Peine A (2021) From mattering to mattering more: ‘Goods’ and ‘bads’ in ageing and innovation policy discourses. *International Journal of Environmental Research and Public Health* 18(14), 7596. <https://doi.org/10.3390/ijerph18147596>
- Gudmundsson H and Thorarinsson T (2015) Innovation and welfare [Nýsköpun og velferð]. <https://www.visir.is/g/2015151008750/nyskopun-og-velferdartaekniisir>
- Hammar T, Alastalo H & Mielikäinen L (2018). *Teknologia tukee kotihoidon asiakkaiden omatoimisuutta ja turvallisuutta-eroja käyttöönnotossa maakuntien välillä*. Helsinki: Terveyden ja hyvinvoinnin laitos.
- Hasselblad A (2021) Values behind welfare technology and their possible realization: Creation of a technology evaluation method for care practices. Mid Sweden University.
- Helsedirektoratet (2022) Omsorg 2022. Årsrapport - velfærdsteknologi i omsorgstjenesten. Available at <https://www.helsedirektoratet.no/rapporter/omsorg-2022--arsrapport-velferdsteknologi-i-omsorgstjenesten/statistikk-for-bruk-av-velferdsteknologi-i-den-kommunale-helse-og-omsorgstjenesten> (accessed 28 January 2025).
- Hämäläinen, A. (2024). Encountering the other – care ethics and the technologisation of care of older persons [Doctoral dissertation]. University of Jyväskylä. JYU Dissertations, 782.
- Hämäläinen A, Leinonen E & Era S (2024) Attunement as a practice of encountering dementia time in long-term eldercare work. *Time & Society* 33(2), 170–190.
<https://doi.org/10.1177/0961463x231215945>
- Hæsum L K E (2015) Health literacy and the use of telehomecare technology – An exploration of both sides of the interaction. Aalborg Universitetsforlag.
- Højland N (2007). Teknologi afløser menneskelig pleje. Jyllands-Posten, 13. september 2007.

- Iceland's Parliament (2023). Tillaga til þingsályktunar um aðgerðaáætlun um þjónustu við eldra fólk fyrir árin 2023–2027 [Action plan related to services for older people in the years 2023–2027]. <https://www.althingi.is/altext/153/s/1761.html>
- Jaakola J (2023) *Welfare Technologies in Finland: An Ethico-politics of Hype, Hope and Experimentation*. Turku: University of Turku.
- Kamp A, Obstfelder A & Andersson K (2019) Welfare technologies in care work. *Nordic Journal of Working Life Studies* 9(S5), 1. <https://doi.org/10.18291/njwls.v9is5.112692>
- Karhinen J, Oinas T, Tammelin M, Hämäläinen A, Hirvonen H, Mustola V, Rantala E & Taipale S (2021) *Vanhustyö ja teknologia. Jyväskylän yliopiston vanhustyön kyselytutkimus 2021: Katsaus tutkimusaineistoon*. Jyväskylä: University of Jyväskylä.
- Kohlen H (2011) Care transformations: Attentiveness, professional ethics and thoughts towards differentiation. *Nursing Ethics* 18(2), 258–261. <https://doi.org/10.1177/0969733010396818>
- Kommunernes Landsforening (2018) Center for Velfærdsteknologi. Statusrapport 2018. Afsluttende rapport. <https://www.kl.dk/media/17891/statusrapport-2018.pdf>
- Kommunernes Landsforening (2020) Velfærdsteknologi i kommunerne - status på anvendelsen af velfærdsteknologier på socialområdet og sundheds- og ældreområdet.
- Nasjonal kommunikasjonsmyndighet (2023) Digital inkludering - ekomtjenester for alle. Rambøll.
- la Cour A & Højlund H (2019) Untimely welfare technologies. *Nordic Journal of Working Life Studies* 9(S5), 69–87. <https://doi.org/10.18291/njwls.v9is5.112688>
- Lilholt P H (2016) *Evaluation of a Telehealthcare Intervention for Patients with COPD: health- and patient-related evaluation of the Danish telecare north trial*. Aalborg Universitetsforlag.
- Lindberg D (2023) Valfærdsteknologi i de nordiska länderna: En kartläggning av statliga satsningar(978-91-89787-02-5(ISBN)). <http://urn.kb.se/resolve?urn=urn:nbn:se:norden:org:diva-12932>
- Lipp B M (2019) *Interfacing RobotCare - On the Techno-Politics of Innovation*. Munich: Technische Universität München.
- Lunde A, Drachmann A L & Christiansen K (2017) Sygeplejerskers arbejde med telemedicin i en tværsektoriel kontekst. *Klinisk Sygepleje* 31(2), 80–95. <https://doi.org/10.18261/issn.1903-2285-2017-02-02>
- Lydahl D (2023) Good care and adverse effects: Exploring the use of social alarms in care for older people in Sweden. *Health* 28(4), 559–577. <https://doi.org/10.1177/13634593231185260>
- Lydahl D & Davidsson A (2024) Values of welfare technologies: a qualitative study of how employees in Swedish care for older adults understand and justify the use of new technology. *BMC Health Services Research* 24(1), 1–17. <https://doi.org/10.1186/s12913-024-12053-1>
- Ministry of Health (2019) Heilbrigðisstefna Stefna fyrir íslenska heilbrigðisþjónustu til ársins 2030 [Health Policy: A policy for Iceland's health services until 2030]. https://www.stjornarradid.is/library/04-Raduneytin/Heilbrigdisraduneytid/ymsar-skrar/Heilbrigdisstefna_4.juli.pdf
- Ministry of Health (2020). Aðgerðaáætlun um þjónustu við einstaklinga með heilabilun [Action plan for services for people with dementia]. <https://www.stjornarradid.is/library/04-Raduneytin/Heilbrigdisraduneytid/ymsar-skrar/A%C3%B0ger%C3%B0a%C3%A1%C3%A6tlun%20um%20%C3%BEj%C3%B3nustu%20vi%C3%B0%20einstaklinga%20me%C3%B0%20heilabilun.pdf>
- Ministry of Health (2021). Virðing og reism. Samþætt heilbrigðis- og félagsþjónusta fyrir eldra fólk [Dignity and respect: Integrated health and social services for the care of older people – A strategic plan]. <https://www.stjornarradid.is/gogn/rit-og-skyrslur/stakt-rit/2021/06/30/Virding-og-reism.-Samthaett-heilbrigdis-og-felagsthjonusta-fyrir-eldra-folk/>
- Ministry of Health and Care Services (2011). NOU 2011: 11 Innvasjon i omsorg.

- Ministry of Health and Ministry of Social Affairs (2023). Gott að eldast: Aðgerðaáætlun um þjónustu við eldra fólk 2023–2027 [It is good to grow old: Policy plan in relation to services for older people]. https://www.stjornarradid.is/library/02-Rit--skyrslur-og-skrar/Gottadeldast_Adgerdaaetlun.pdf.
- Ministry of Welfare (2015). Policy around innovation and technology in welfare services. [Stefna í nýsköpun og tækni á sviði velferðarþjónustu]. https://www.stjornarradid.is/media/velferdarraduneytimedia/media/rit-og-skyrslur-2015/Stefna_i_nyskopun_og_tækni_28092015.pdf
- Ministry of Welfare (2016). E-health services [Fjarheilbrigðisþjónusta - Efling fjarheilbrigðisþjónustu Skýrsla starfshóps]. Ministry of Welfare. <https://www.stjornarradid.is/gogn/rit-og-skyrslur/stakt-rit/2016/10/27/Efling-fjarheilbrigdisthjonustu-skyrsla-starfshops/>
- Ministry of Welfare (2018). E-health services [Fjarheilbrigðisþjónusta - Í takt við nýja tíma]. Ministry of Welfare. <https://www.stjornarradid.is/gogn/rit-og-skyrslur/stakt-rit/2018/09/19/Fjarheilbrigdisthjonusta-i-takt-vid-nyja-tima/>
- Moberg L (2017) *Marketization in Swedish eldercare: Implications for users, professionals, and the state*. Uppsala: Uppsala University.
- Mort M, May C R & Tracy W (2003) Remote doctors and absent patients; acting at a distance in telemedicine? *Science, Technology and Human Values* 28(2), 274–295. <https://doi.org/10.1177/0162243902250907>
- Neven L & Peine A (2017) From triple win to triple sin: How a problematic future discourse is shaping the way people age with technology. *Societies* 7(3), 26. <https://doi.org/10.3390/soc7030026>
- Nickelsen, N. C. M. (2013) Criteria of implementing feeding assistance robots in disability care: a sociomaterial perspective. *Journal of comparative social work*, 8(2), 1–29.
- Nickelsen, N. C. M. (2019a) Imagining and tinkering with assistive robotics in care for the disabled. *Paladyn, Journal of Behavioral Robotics*, 10(1), 128–139. <https://doi.org/10.1515/pjbr-2019-0009>
- Nickelsen, N. C. M. (2019b). Active citizenship and feeding assistive robotics – a crumbling story? In C. Hasse & D. M. Sondergaard (eds.) *Designing Robots – Designing Humans* (pp. 73–87). Abingdon: Routledge.
- Nickelsen N C M & Pols J (2024) Enacting different stories - what does telemonitoring become in chronic ill persons lives? *STS Encounters - Research papers from DASTS* 16(3), 20.
- Nickelsen N C M & Simonsen Abildgaard J (2022) The entwinement of policy, design and care scripts: Providing alternative choice-dependency situations with care robots. *Sociology of Health & Illness* 44(2), 451–468. <https://doi.org/10.1111/1467-9566.13434>
- Nielsen A J & Jensen C B (2013) Travelling frictions: Global disease self-management, local comparisons and emergent patients. *Science & Technology Studies* 26(2), 61–79. <https://doi.org/10.23987/sts.55299>
- Nielsen J A, Andersen K N & Sigh A (2016) Robots conquering local government services: A case study of eldercare in Denmark. *Information polity* 21(2), 139–151. <https://doi.org/10.3233/ip-160381>
- Nordic Welfare Centre (2024). Welfare Technology. Available at <https://nordicwelfare.org/en/welfare-policy/welfaretech/> (accessed January 28, 2025).
- Olsson T & Viscovi D (2023) Digitalised welfare: Access, usage, and outcomes among older adults. *Media and Communication* 11(3), 18–28. <https://doi.org/10.17645/mac.v11i3.6694>
- Oudshoorn N (2009) Physical and digital proximity: emerging ways of health care in face-to-face and telemonitoring of heart-failure patients. *Sociology of Health and Illness* 31(3), 390–405. <https://doi.org/10.1111/j.1467-9566.2008.01141.x>
- Pols J (2012). *Care at a Distance: On the Closeness of Technology*. Amsterdam: Amsterdam University Press. https://doi.org/10.26530/oapen_413032
- Procter R, Wherton J, Greenhalgh T, Sugarhood P, Rouncefield M & Hinder S (2016) Telecare call centre work and ageing in place. *Computer Supported Cooperative Work (CSCW)* 25, 79–105. <https://doi.org/10.1007/s10606-015-9242-5>

- Pekkarinen S & Melkas H (2019) Welfare state transition in the making: Focus on the niche-regime interaction in Finnish elderly care services. *Technological Forecasting and Social Change* 145, 240–253. <https://doi.org/10.1016/j.techfore.2018.09.015>
- Regeringen (2011) Et Danmark der står sammen, Regeringsgrundlaget.
- Regeringen & KL (2013) Aftale om kommunernes økonomi for 2014.
- Regeringen, KL & Regioner D (2022) Digitalisering der løfter samfundet - Den fællesoffentlige digitaliseringsstrategi 2022–2025.
- Reykjavík Welfare Services (2022). Stefna velferðarsviðs Reykjavíkurborgar á sviði velferðartækni 2022-2026 [City of Reykjavik Policy ein relation to Welfare Technology 2022-2026]. <https://reykjavik.is/sites/default/files/2022-04/Dr%C3%B6g-Stefna-Velfer%C3%B0arsvi%C3%B0s-um-velfer%C3%B0art%C3%A6kni-2022-2026.pdf>
- Rostad H M & Stokke R (2021) Integrating Welfare Technology in Long-term Care Services: Nationwide Cross-sectional Survey Study. *Journal of Medical Internet Research* 23(8), e22316-e22316. <https://doi.org/10.2196/22316>
- Rytönen A (2018) *Hoivatyöntekijöiden työn kuormittavuus ja teknologian käyttö vanhustyössä*. Tampere: Tampere University.
- Schou J & Pors A S (2019) Digital by default? A qualitative study of exclusion in digitalised welfare. *Social policy & administration* 53(3), 464–477. <https://doi.org/10.1111/spol.12470>
- Sjögren H, Niemistö C, Hearn J & Viallon M (2023) *What's the problem with older people? A policy analysis of selected Finnish reports and documents on ageing, care and digitalisation*. Hanken School of Economics Working Papers: 567. Helsinki: Hanken School of Economics.
- Socialstyrelsen (2021) E-hälsa och välfärdsteknik i kommunerna 2021: uppföljning av den digitala utvecklingen i socialtjänsten och den kommunala hälso- och sjukvården.
- Socialstyrelsen (2023) E-hälsa och välfärdsteknik i kommunerna 2023: uppföljning av den digitala utvecklingen i socialtjänsten och den kommunala hälso- och sjukvården. Socialstyrelsen.
- Socialstyrelsen (2024) E-hälsa och välfärdsteknik i kommunerna 2024. Uppföljning av den digitala utvecklingen i socialtjänst och kommunal hälso- och sjukvård.
- Sosiaali- ja terveysministeriö (STM) (2008) Ikäihmisten palvelujen laatusuositus [Quality recommendation on services of older persons.] Sosiaali- ja terveysministeriön julkaisuja 2008:3.
- Sosiaali- ja terveysministeriö (STM) (2015) Information to support well-being and service renewal: eHealth and eSocial Strategy 2020. Sosiaali- ja terveysministeriö.
- Sosiaali- ja terveysministeriö (STM) (2017) Laatusuositus hyvän ikääntymisen turvaamiseksi ja palvelujen parantamiseksi 2017–2019 [Quality recommendation to guarantee a good quality of life and improved services for older persons 2017–2019.] Sosiaali- ja terveysministeriön julkaisuja 2017:6.
- Sosiaali- ja terveysministeriö (STM) (2018) Hyvinvoinnin AiRo-ohjelma #hyteairo. [AiRo program for Welfare #hyteairo.] Helsinki: Sosiaali- ja terveysministeriö.
- Sosiaali- ja terveysministeriö (STM) (2020) Laatusuositus hyvän ikääntymisen turvaamiseksi ja palvelujen parantamiseksi 2020–2023. [Quality recommendation to guarantee a good quality of life and improved services for older persons 2020–2023.] Sosiaali- ja terveysministeriön julkaisuja 2020:29.
- Sosiaali- ja terveysministeriö (STM) (2024) Laatusuositus aktiivisen ja toimintakykyisen ikääntymisen ja kestävien palvelujen turvaamiseksi 2024–2027 [Quality recommendation to guarantee a active and capable ageing and sustainable services 2024–2027]. Sosiaali- ja terveysministeriön julkaisuja 2024: 4.
- Szebehely M & Meagher G (2018) Nordic eldercare—weak universalism becoming weaker? *Journal of European social policy* 28(3), 294–308. <https://doi.org/10.1177/0958928717735062>
- Teknologisk Institut (2023) Velfærdsteknologi i de danske kommuner 2023. Undersøgelse af danske kommuners anvendelse af velfærdsteknologi.

- Terveyden ja hyvinvoinnin laitos (THL) (2023) Kotihoidon uudet ratkaisut – kotona asumisen teknologiat ikäihmisille – KATI-ohjelman 2020–2023 loppuraportti. [Technology Supporting Smart Ageing and Care at Home Programme 2020–2023, final report].
- Thygesen H (2019) Velferdsteknologi og nye tjenesteløsninger: definisjoner, kategorier, bakgrunn og etikk. In Moser I (ed), *Velferdsteknologi - en ressursbok*. Cappelen Damm akademisk.
- Tsing A L (2005) *Friction: An Ethnography of Global Connection*. Princeton University Press. <https://doi.org/10.1515/9780691263526>
- Tupasela A, Snell K & Tarkkala H (2020) The Nordic data imaginary. *Big Data & Society* 7(1), 2053951720907107. <https://doi.org/10.1177/2053951720907107>
- Udsen F W (2016) *Health Economic Evaluation of Telehealthcare : Can we include “why” and “under what circumstances” telehealthcare is cost-effective in health economic evaluation?* Aalborg Universitetsforlag. <https://doi.org/https://doi.org/10.5278/VBN.PHD.SOCSCI.00064>
- Valokivi H, Carlo S, Kvist E & Outila M (2023) Digital ageing in Europe: A comparative analysis of Italian, Finnish and Swedish national policies on eHealth. *Ageing & Society* 43, 835–856. <https://doi.org/10.1017/s0144686x21000945>
- Van Aerschoot L & Parviainen J (2020) Robots responding to care needs? A multitasking care robot pursued for 25 years, available products offer simple entertainment and instrumental assistance. *Ethics and Information Technology* 22(3), 247–256. <https://doi.org/10.1007/s10676-020-09536-0>
- Wright J (2023) *Robots Won't Save Japan: An Ethnography of Eldercare Automation*. Ithaca: Cornell University Press. <https://doi.org/10.7591/cornell/9781501768040.001.0001>
- Zechner M, Näre L, Karsio O, Olakivi A, Sointu L, Hoppania H-K & Vaitinen T (2022) *The Politics of Ailment: A New Approach to Care*. Bristol: Policy Press. <https://doi.org/10.2307/j.ctv2rh2c16>
- Åkerlind C (2017) *eHomecare-For Safety and Communication in Everyday Life: The Perspectives of Older Users, Relatives and Care Managers*. Mälardalen: Mälardalen University.
- Östlund B (2015) The benefits of involving older people in the design process. In Human Aspects of IT for the Aged Population. Design for Aging: First International Conference, ITAP 2015, Held as Part of HCI International 2015, Los Angeles, CA, USA, August 2-7, 2015. Proceedings, Part I 1 (pp. 3-14). Springer International Publishing.