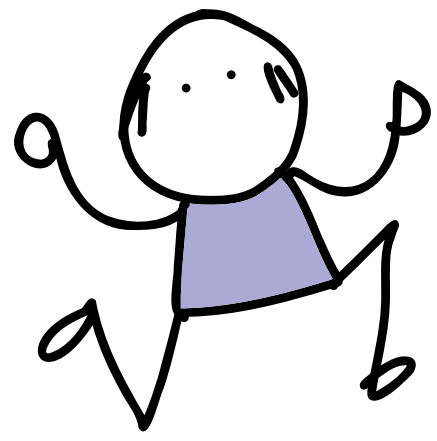


© Raquel Benmergui, Raakku

Proactive health and welfare technology for Nordic users and societies – A policy brief



What is health and welfare technology and who uses it?

The Nordic region has set the aim of becoming the world's most sustainable and integrated region by 2030. This ambitious vision consists of interlinked strategic priorities. An important part of its implementation is taking action towards social sustainability, such as contributing to good, equal and secure health and welfare for all as well as working to involve everyone living in the Nordic region in digital developments. The vision emphasises that good health and welfare are fundamental to people's ability to reach their full potential and contribute to societal development.

This policy brief focuses on use of health and welfare technology that – when skilfully implemented – can serve the realisation of the Nordic vision, for example, by improving access to health and welfare services and facilitating preventive measures that create conditions for good physical and mental health.

The concept of health and welfare technology covers a wide sphere of diverse appliances and solutions. Health technology and welfare technology are sometimes seen as separate and are sometimes used side by side, such as in this policy brief. Various definitions broadly emphasise technology, which in one way or another improves the lives of those who need it (Nordic Welfare Centre, 2023, on *welfare* technology), or the application of organised knowledge and skills in the forms of devices, medicines, vaccines, procedures and systems developed to solve a health problem and improve quality of life (WHO, 2023, on *health* technology). User groups are also seen differently: health and welfare technology can be used to maintain or increase security, activity, participation or independence for older people or those with a disability, or the focus may be on professional caregivers and improving their working conditions.

Diverse definitions may make it challenging to reach a sufficiently focused approach to discussing

health and welfare technology and its use. A few examples of health and welfare technology are safety alarm systems, remote care applications and care robotics. Thus, there are major differences between the technologies and their uses, which is important to keep in mind. In addition to practical help, these technologies can support, for example, social participation, independence, autonomy and communication. This policy brief also recognises that there are neighbouring concepts, such as telemedicine, e-health and gerontechnology, but a more detailed discussion of these is beyond its scope.

Current and potential users of health and welfare technology are diverse. Clients and patients are easy to identify; however, non-clients, people who are not clients of care services (yet) but might benefit from health and welfare technology, should not be forgotten. Informal caregivers' role in obtaining health and welfare technology, guiding its use, using it and reminding clients and patients about its use may be central, making them

a significant user group, too. All these people are different; they represent different age groups, health conditions, needs and preferences.

Old age is a long phase in life with different sub-phases, so it is vital to have a sufficiently nuanced understanding of this and not to see older people as one homogeneous group. People with disabilities are also very heterogeneous and are a primary user group in health and welfare technology. Professional caregivers represent different educational backgrounds and professions and work in distinctive environments, making them another heterogeneous user group.

It is easy to slip to an overly technology-based discussion that overlooks the diversity of (potential or actual) users. **The use of health and welfare technology is playing an increasingly important role** in diverse users' lives, in care work and its processes, and in Nordic societies as a whole. This is a phenomenon that can emerge from a broad range of needs and cause a broad

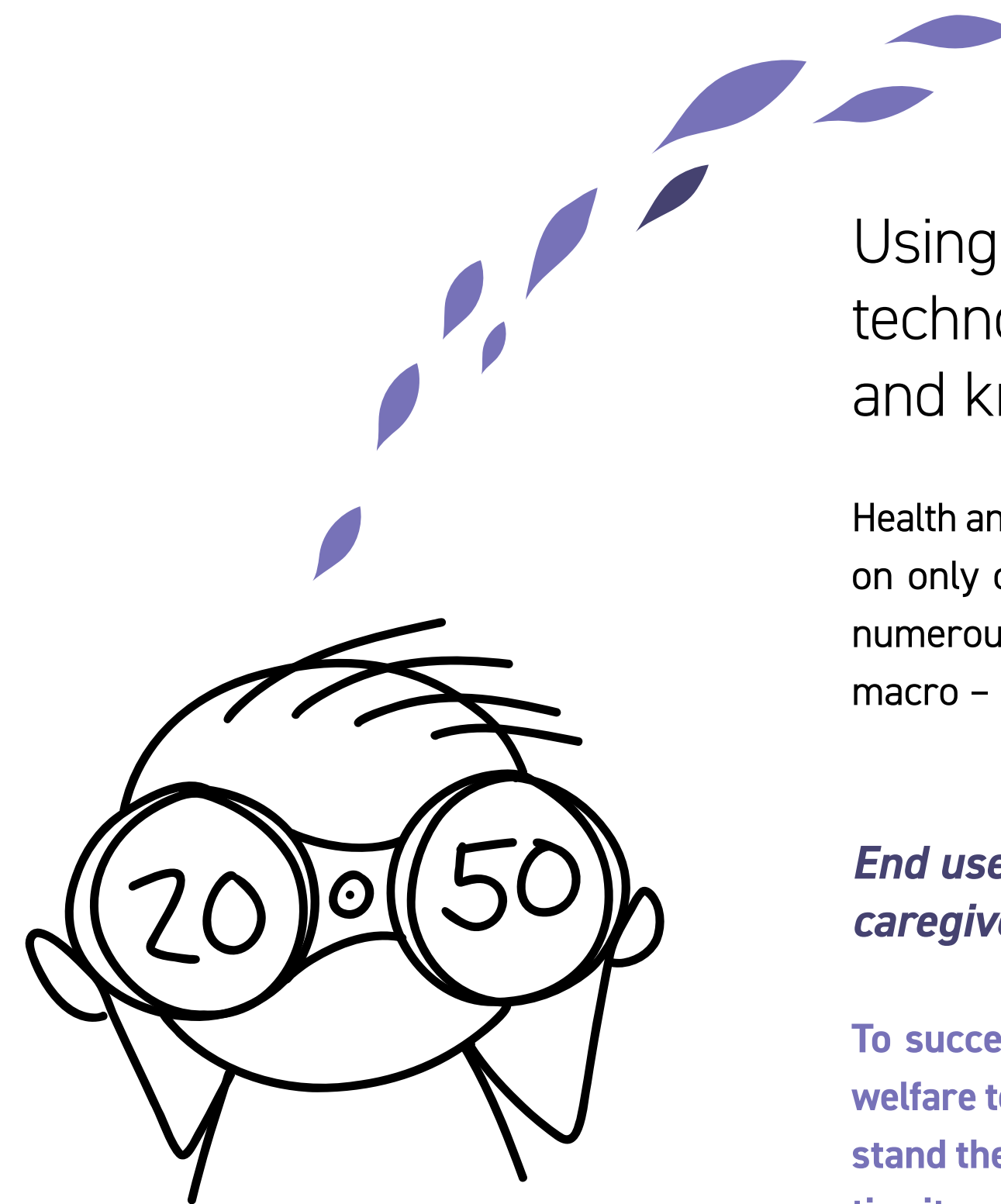
range of experiences, interacting at the individual, organisational, societal and technical levels.

The use of health and welfare technology can have social, economic, environmental and cultural impacts. Social impacts, for example, may be related to positive, negative or neutral impacts on clients or patients (e.g., on their health, independence, autonomy or loneliness) or on professional caregivers (e.g., on their coping at work, time use, competence needs or health).

This policy brief addresses the challenges and knowledge needs related to health and welfare technology use. It is particularly focused on Nordic countries because the research work was conducted there. However, the topic is relevant to other countries and regions, as the health and well-being of citizens and professional caregivers are important issues in all countries.

The policy brief is based on the results gained in the Nordic research networking project, Proactive health and welfare technology for Nordic users and societies (PROTECT), which arranged a workshop series to advance Nordic research-based knowledge of proactive health and welfare technology at three levels: (1) end users (older-age clients/patients and people with disabilities) and their informal caregivers (micro level); (2) the implementation level from the perspective of professional caregivers and organisations (meso level); and (3) the societal (macro) level.

Nearly 200 workshop participants, including researchers from many disciplines and a diverse array of stakeholders, contributed to hybrid participatory workshops that involved national sessions and international online collaboration, presentations and discussions.



Using health and welfare technology: Nordic challenges and knowledge needs

Health and welfare technology use does not occur on only one level. It affects (and is affected in numerous ways by) the three – micro, meso and macro – levels and their dynamics.

End users and their informal caregivers – micro level

To successfully support the use of health and welfare technology, it is necessary to first understand the challenges it faces and the opportunities it provides at the micro level. Knowledge is needed for such understanding to emerge.

A starting point is to acknowledge diversity and people's individual circumstances. One size does not fit all. In principle, anyone can be a health and welfare technology user. At the same time, users can have professional roles. Users have varying needs and may lack awareness of, access to or the ability to use technology or make sense of information related to health and welfare technology.



The main Nordic challenges, and thus knowledge needs, at the **micro level** (end users and informal caregivers) have been identified as follows:

Main micro-level challenges and knowledge needs	Examples of essential elements to consider
Digital exclusion	<ul style="list-style-type: none"> ▶ Sufficient support for technology use ▶ Ways to motivate non-users
User involvement	<ul style="list-style-type: none"> ▶ New methods to involve users
Implementation of technology	<ul style="list-style-type: none"> ▶ Management practices ▶ Training of professional caregivers (digital skills) ▶ Developing and advancing a shared language
Safety, security and ethical issues	<ul style="list-style-type: none"> ▶ Deep understanding of everyday life ▶ Prerequisites for meaningful technology use
Research methods	<ul style="list-style-type: none"> ▶ Multiple research methods ▶ Validated instruments and large studies ▶ Multi-disciplinarity

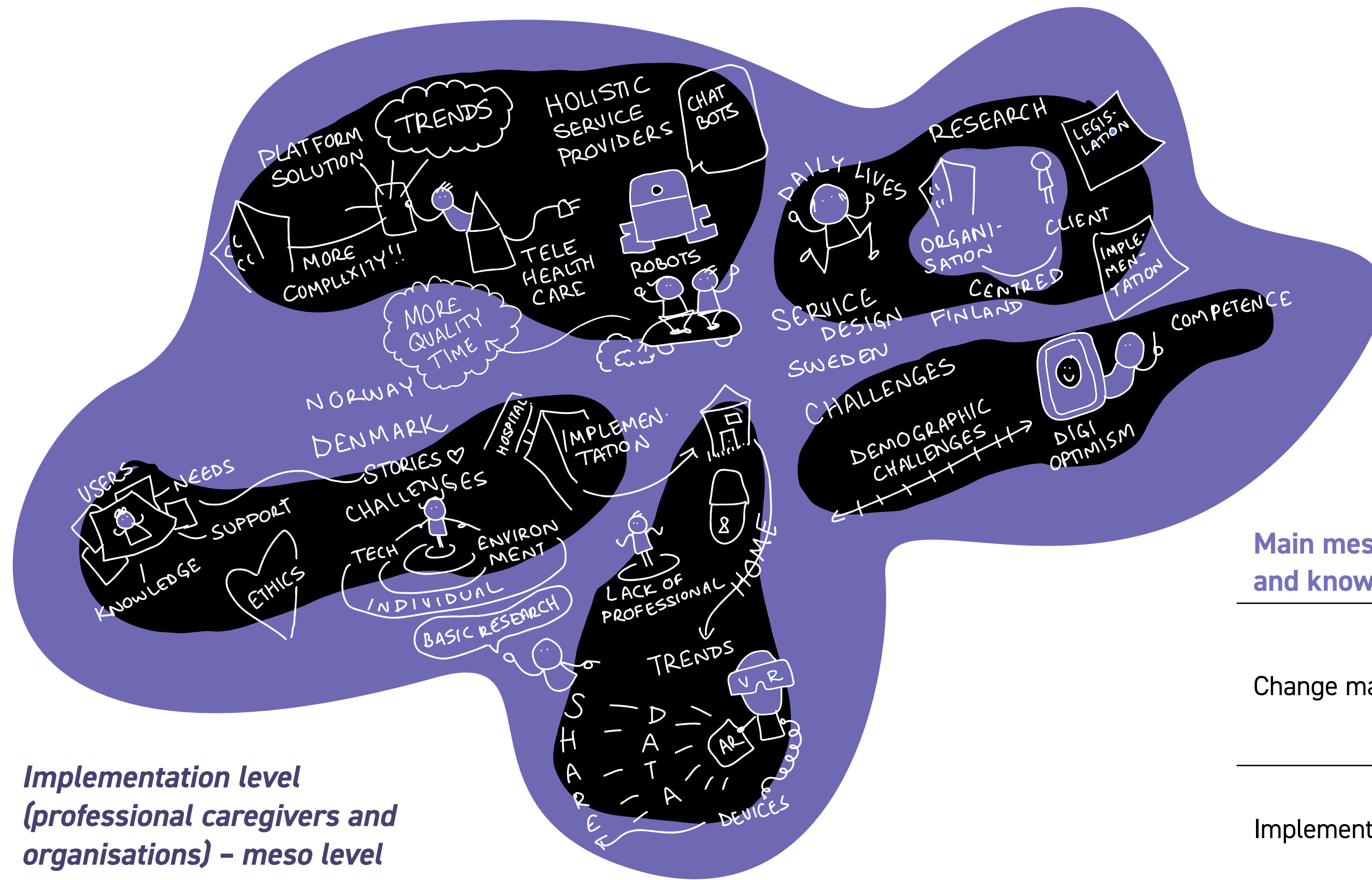
Digital exclusion can be a problem for older people, people with disabilities as well as many other citizens. Awareness of this problem and its risks is key, and a lot of support is needed to overcome digital exclusion. Essential questions to be pondered are, for example, what kind of active support and how much support is needed, and what is sufficient to decrease and hinder digital exclusion? Active work with digital inclusion is a way to move forward, while the process of digital transformation continues in healthcare and social care services.

Many people could benefit from the use of health and welfare technology but are not yet its users. It is essential to consider how to motivate such non-users. Involvement of current users during the planning, introduction, use and assessment of health and welfare technology brings important benefits in making its use smoother and more effective. It is not necessarily obvious what kinds of methods should be chosen to involve users of different types. The development and refinement

of new methods to involve users should be focused on. Overall, building knowledge about the micro level would benefit from the development of research methods and especially collaboration among different scientific disciplines.

In general, the implementation of technology is challenging and does not occur automatically or in a vacuum. Major efforts are required for truly successful implementation, such as those to develop management practices, train professional caregivers and find a shared language amongst all those concerned (i.e., different professional groups, managers, clients/patients and their informal caregivers and other stakeholders).

Safety, security and ethical issues are an integral part of health and welfare technology use. To deal with these issues, there should be a deep understanding of the everyday lives of health and welfare technology users, and the prerequisites for meaningful technology use should be carefully considered.



**Implementation level
(professional caregivers and organisations) – meso level**

Challenges and opportunities at the meso level depend on local characteristics, needs and prerequisites of the organisation, community, municipality or alike. One size does not necessarily fit all at the meso level, either. Each care organisation and its personnel, clients or patients differ; thus, their knowledge levels, implementation challenges and opportunities and needs for change management also vary.

The main Nordic challenges and thus knowledge needs at the **meso level** (implementation level: professional caregivers and organisations) have been identified as follows:

Main meso-level challenges and knowledge needs

Examples of essential elements to consider

Change management	<ul style="list-style-type: none"> ▶ Changed ways of giving care ▶ Piloting and testing (environments, practices) ▶ Work processes ▶ Intervention and impact studies
Implementation	<ul style="list-style-type: none"> ▶ Practical anchoring of implementation ▶ Prerequisites in the implementation process (time, money, knowledge and infrastructure)
Meaningfulness	<ul style="list-style-type: none"> ▶ Increased understanding of why technology is/could be/should be used ▶ Contextual understanding
Knowledge	<ul style="list-style-type: none"> ▶ Provision of insights, education, training and competence ▶ Availability, appropriateness and usefulness for diverse users
Impact studies and cost-effectiveness studies	<ul style="list-style-type: none"> ▶ Relevant methods for studying impacts and effectiveness of products and services

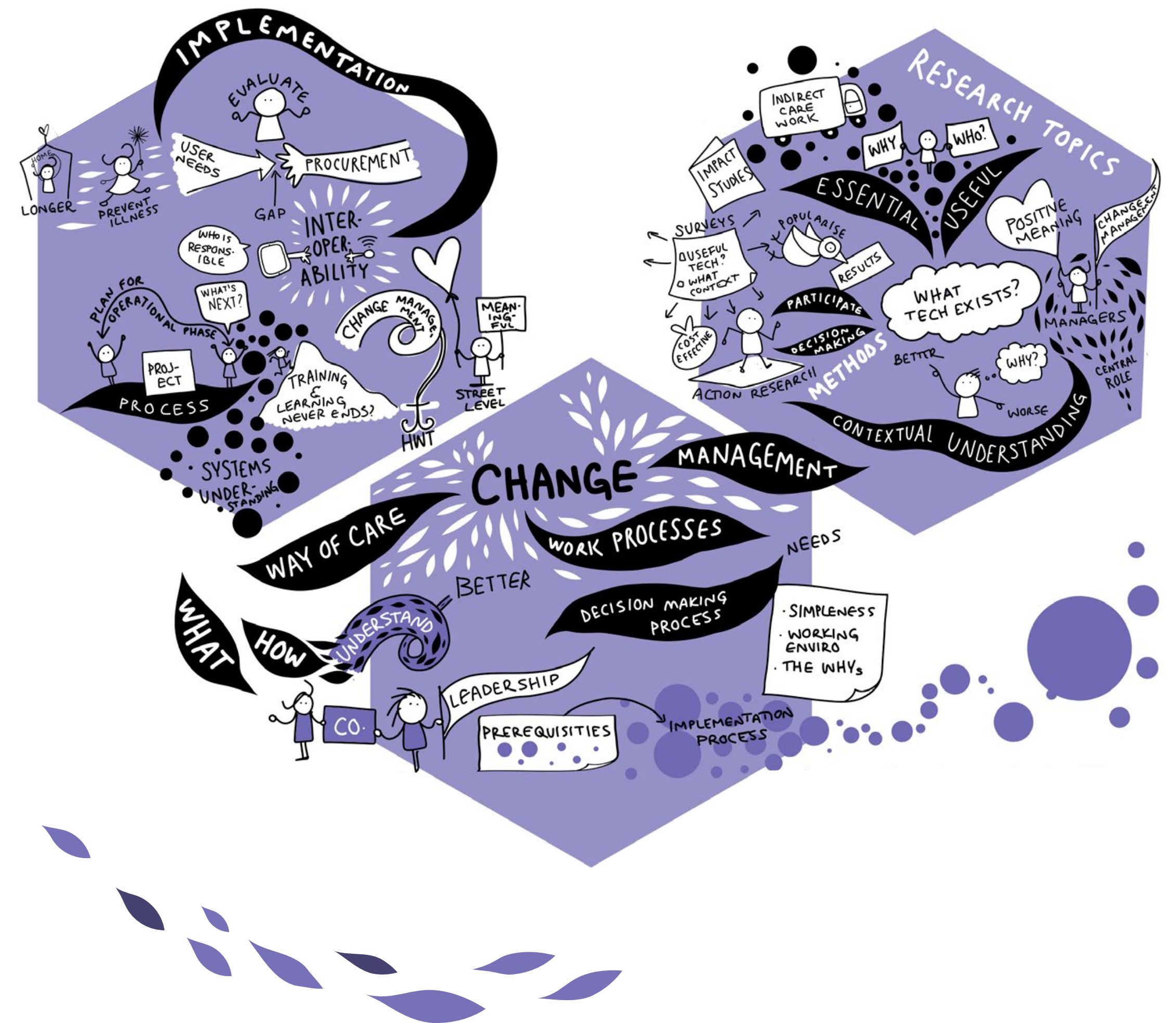


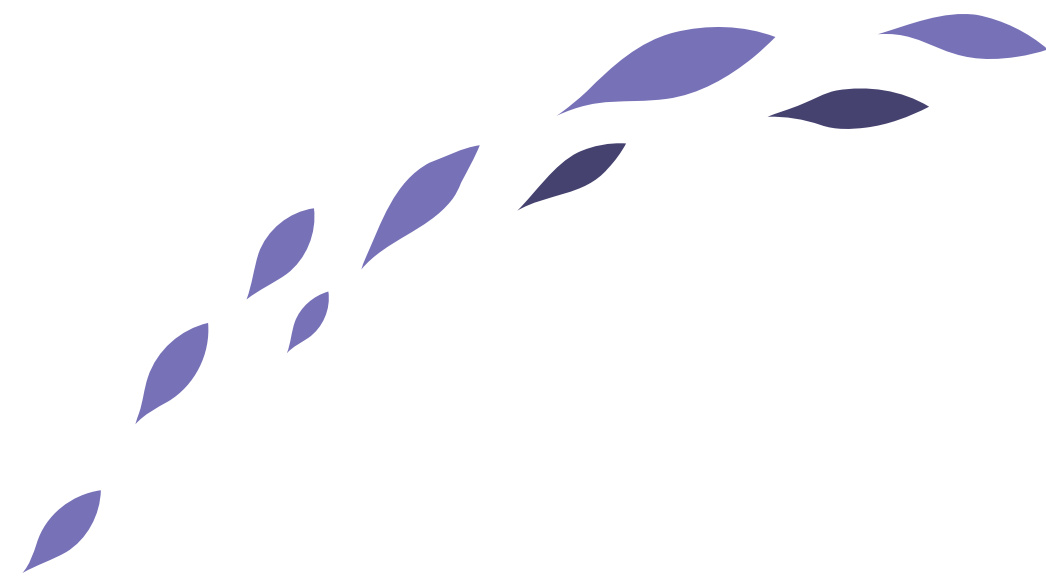
Similarities with micro-level knowledge needs are visible: meso-level results also concern management, implementation and meaningfulness. Care services, care processes and care itself change along with the introduction and use of health and welfare technology. Piloting and intervention studies can show appropriate paths forward and build knowledge of short-term impacts. Change management is needed at all levels and stages. As for implementation, anchoring of the implementation of health and welfare technology is key at the meso level. Prerequisites in the implementation process need to be known – in the organisation and service in question – and this concerns issues such as time, money, existing knowledge and infrastructure.

Along with the micro level, care personnel's and employers' contextual and systemic understanding of meaningful technology use also needs to be increased. Why would technology be used? What aims are there? From whose point of view? Can they be achieved with the planned technology? Such questions are closely related to knowledge

needs more generally. What technology should be used and how? What is available, essential and useful, and for whom? What kind of education, training or other competence-building are needed? For such types of knowledge to accumulate, multimethod research on impacts and effectiveness is vital.

Additional challenges and knowledge needs were brought up at the meso level as follows: decision-making processes and leadership were emphasised, along with participation, co-creation, collaboration and assessment of needs. Simplicity is also essential to keep in mind. There may be “low-hanging fruit” and win-win situations and opportunities for the simplification of processes. Related to decision-making, procurement and system administration require careful attention. Professional caregivers' user needs must be known, and the current gap between users' needs and procurement must be solved. Professional caregivers' working environment changes in line with the introduction of health and welfare technology, which requires planning, development





and assessment. Moreover, the education of professional caregivers should be developed so that expertise in health and welfare technology use forms an integral part of future studies.

The interoperability of digital products may be a challenge that requires understanding the broader infrastructure and its readiness to integrate new solutions. Responsibility for the functioning of technologies may remain unclear unless responsible persons are named. Proper familiarisation with this task is also important. From a user's viewpoint, the user journey requires attention, starting with considerations of when is an appropriate time to introduce technology to a user's life and what technology serves her or his needs.

The societal (macro) level

Decision-makers play an important systemic role in societal strategies and planning related to health and welfare technology use. They need sufficient knowledge and a systemic understanding of the broadness of the topic and its links to services and the entire service system.

While health and welfare technology use has increased across the Nordic countries, there is a lot to do in encouraging, promoting and even formalising the use via policies. Decision-makers will have a crucial role in consolidating this trend by establishing lines of action (and, where appropriate, strategies and regulations) that could be followed to improve conditions for health and welfare technology use. Health and welfare technology use is a multifaceted phenomenon in which the levels of use can be significantly influenced if appropriate policies are set in place.

The main Nordic challenges and thus knowledge needs at the **macro level** (decision-making) have been identified as follows:

Main macro-level challenges and knowledge needs	Examples of essential elements to consider
Impacts and costs of health and welfare technology	<ul style="list-style-type: none"> ▶ Methods to measure impacts (economic and other, such as impacts on people's well-being and exclusion) ▶ Validated instruments ▶ Broad effectiveness – not just of one solution
Systematic reviews of what we know	<ul style="list-style-type: none"> ▶ A clear categorisation of solutions ▶ Enabling systematic monitoring of for whom solutions are appropriate and how they affect people ▶ Identification of knowledge gaps
Proactiveness	<ul style="list-style-type: none"> ▶ Preventive care versus technology ▶ Clients/patients' own experiences (whatever the solution)



The macro-level results further confirm the importance of building knowledge on the impacts of health and welfare technology use. To find out about those – including economic perspectives such as costs – appropriate methods need to be considered carefully. It is often beneficial to combine, for example, quantitative and qualitative research when examining impacts so that impacts on people's well-being and possible digital exclusion can also be made visible.

Broad effectiveness should be aimed at; adopting and examining just one solution is not enough. For decision-makers, systematic reviews of what we know are essential. This means, for example, the need for a clear categorisation of solutions

that would enable systematic monitoring of the appropriateness of solutions for different types of users and of their impacts. It would also ease the identification of various knowledge gaps.

Additional knowledge needs were recognised at the macro level as follows: Various macro-level stakeholders should have the opportunity to participate in identifying research gaps concerning health and welfare technology and its use. Such identification requires understanding and focusing on the micro, meso and macro levels and decision-makers have an important role to play.

Decision-makers' role in supporting the implementation of change management is crucial.

They are the ones needed for national-level leadership in the health and welfare technology-related transition. Enabling proper change management at the organisational level should be part of this. The implementation of technology as part of care processes requires new knowledge and competences.

Scenario building and horizon scanning on health and welfare in the future can assist decision-makers in their tasks, and such foresight activities may also be of help at the organisational level. Overall, there should be large projects covering the entire national ecosystem, including sustainability (also environmental) aspects. Moreover, comparative studies are valuable – focusing on,

for example, municipalities' diversity and comparisons between countries.

The big picture of the economy of well-being was emphasised. How do good well-being and health advance the economic situation? Considerations related to health and welfare technology should take this into account. The central themes are digital exclusion or inclusion and digital literacy. Health and welfare technology use may prevent or mitigate digital exclusion, but this is not automatic. Digital inclusion is important to keep in mind – how can it be ensured so that the good potential of technology use is reached in practice? Digital literacy must not be taken for granted in any context but created, improved and maintained continuously.



Practical recommendations

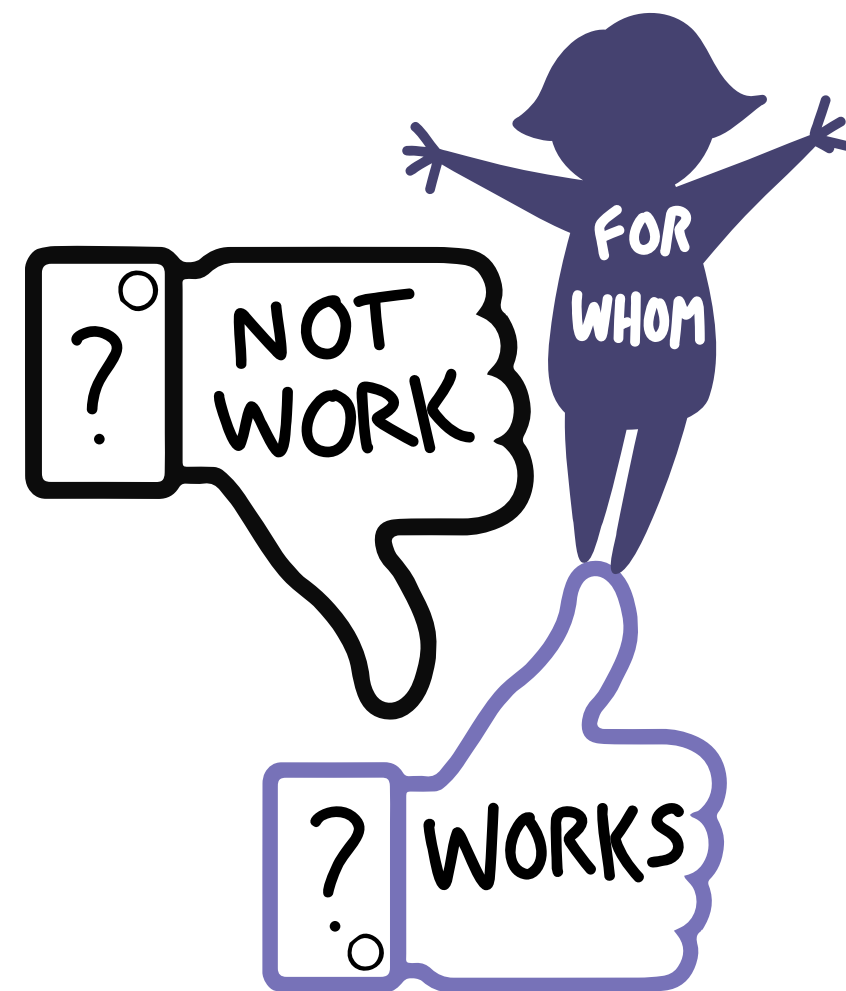
Across the different levels, a key question is how health and welfare technology use can support users towards increased and prolonged independence, health, social participation, security and safety (at home or work), and quality of life.

An understanding of micro-, meso- and macro-level perspectives on health and welfare technology use is essential. Significant information and details are hidden if these three levels are too separate. Improving policy interventions and innovations to enhance proactive and resilience-supporting health and welfare technology use and the quality of life and work of Nordic (or other) citizens and caregivers requires understanding each level and the dynamics between

the levels. Such a systemic understanding can be built through broad stakeholder collaboration and supported by research-based knowledge.

From a systemic perspective, collaboration partners when implementing health and welfare technology encompass a range of important stakeholders. Each of these stakeholders brings unique perspectives, resources and needs to the table, and effective collaboration requires close coordination and communication among all parties. The goal should be to create a cohesive and integrated system that leverages the strengths of each partner to achieve the best possible outcomes for clients/patients, their informal caregivers, professional caregivers and healthcare and social care organisations.

In addition to these stakeholders – ultimate users and beneficiaries of technology – central stakeholders are industry partners (technology companies, software developers and other businesses that provide the tools and resources necessary for the implementation), researchers (scientists who study and evaluate technology and its effectiveness) and decision-makers (e.g., government agencies, regulators and funders who help to set standards, provide funding and ensure the implementation of the technology).





While addressing the challenges and knowledge needs described in this policy brief, some key principles of action for decision-makers (in particular) are:

Embrace a collaborative approach: It is often misunderstood that health and welfare technology use is exclusive to individuals, notably clients or patients, and their homes or care environments. It should be a question of an all-encompassing *transdisciplinary* partnership, which may involve a broad range of people and communities, many types of organisations (care organisations, companies) and society (public, private and non-governmental sectors). Likewise, it should be a widely *multidisciplinary* undertaking, requiring diverse knowledge to develop an understanding of how to build favourable processes and conditions for meaningful health and welfare technology use. *Participatory processes* should be cherished. It is unlikely that top-down policies driven by technological evidence and markets alone will instigate collective (system-level or organisational) and

individual-level action; novel transition policies should have a bottom-up nature and be designed based on participatory processes within communities and organisations.

Provide orientative activities related to health and welfare technology and its use: The focus should be *expanded from mere training*—relatively narrow, often one-way, provision of information—to a more comprehensive understanding of *processes and actions* towards interactive knowledge building in this area as a prerequisite for reaping the benefits of health and welfare technology use. Such orientative activities are a key issue in societies, workplaces and homes. In addition to an introduction to technology use and its familiarisation, a *continuous co-creative process* is needed, including learning multifaceted knowledge and skills for

the technology's effective use. This social action should not be a one-time activity (when a device or solution is brought to use), and as a process, it should also be able to absorb critical views and questioning attitudes.

Acknowledge the diversity of users and their different needs, motivations and preferences: Not all users are the same, nor do they react the same way in response to similar stimuli. There are distinctive user groups with particular needs; one size does not fit all. Technology studies have traditionally been assumption-based and have explicitly omitted this important notion, which should be urgently formalised as a means to prevent digital exclusion and other negative phenomena.

Seek consensus around health and welfare technology-related concepts: The very nature and features of health and welfare technology and its use may be disputed and/or misunderstood and have not yet been fully clarified. In times of urgent action, this hampers the build-up of collective approaches. Decision-makers could have an important role in establishing sufficient and multifaceted consensus within the relevant stakeholders to clarify, even formalise, definitions and approaches that could serve the socio-technical transition related to health and welfare technology use.

Key messages

Collaboration

- ▶ Involve a diverse range of individuals and collectives in the user, organisational and societal spheres
- ▶ Take into account the multidisciplinary nature of health and welfare technology in collaborative knowledge-building
- ▶ Promote bottom-up, participatory and action-based policies in needs identification, implementation, assessment of impacts and effectiveness and knowledge-building

Orientative activities

- ▶ Provide more than training for health and welfare technology use – expand the focus to a more comprehensive and continuous co-creation process
- ▶ In addition to introduction to technology use and its familiarisation, take into account learning of multi-faceted knowledge and skills for the technology's effective use
- ▶ Ensure that this social action is not a one-time activity and that it also absorbs critical views and questioning attitudes

Consensus

- ▶ Embrace joint learning while creating new awareness regarding health and welfare technology use
- ▶ Contribute to clarify health and welfare technology concepts and features
- ▶ Design policy conventions in collaboration with key stakeholders

Diversity

- ▶ Acknowledge different user needs and user responses to technology and market-based (or other types of) stimuli
- ▶ Develop targeted and differentiated policies at the micro and meso levels
- ▶ Work actively towards digital inclusion while the process of digital transformation continues

Further reading

Nordic Welfare Centre (2022) Integrated Healthcare and Care through distance spanning solutions – for increased service accessibility. Authors: Eirin Rødseth, Annabelle-Jane Yabsley, Truls Tunby Kristiansen, Siri Bjørvig. https://nordicwelfare.org/wp-content/uploads/2022/09/Integrated-Healthcare-and-Care-through-distance-spanning-solutions_v4.pdf

Nordic Welfare Centre (2019) Healthcare and care through distance spanning solutions: 24 practical examples from the Nordic region. Editors: Bengt Andersson, Niclas Forsling, Sofia Berggren and Judit Hadnagy. <https://nordicwelfare.org/wp-content/uploads/2020/01/NWC-VOPD-EN-webb.pdf>

Nordic Welfare Centre (2019) Nordic Ambient Assisted Living – Welfare Technologies for Active and Independent Living at Home. Authors: Pall Thomas Finnson, Mona Truelsen, Bengt Andersson. https://nordicwelfare.org/wp-content/uploads/2019/06/Nordic-Ambient-assistive-Living_2019.pdf



Recent publications from the PROTECT project partners

Barbosa, A., Ferreira, A. R., Smits, C., Hegerath, F. M., Vollmar, H., Fernandes, L., Craven, M. P., Innes, A., Casey, D., Sezgin, D., Hopper, L., & Øksnebjerg, L. (2023). Use and uptake of technology by people with dementia and their supporters during the COVID-19 pandemic. *Aging & Mental Health*, 1–12. DOI: [10.1080/13607863.2022.2163375](https://doi.org/10.1080/13607863.2022.2163375)

Kristiansen, E., Atherton, H., Austad, B., Bergmo, T., Lønnebakke Norberg, B., & Zanaboni, P. (2023). Older patients' experiences of access to and use of e-consultations with the general practitioner in Norway: an interview study. *Scandinavian Journal of Primary Health Care*. DOI: [10.1080/02813432.2022.2161307](https://doi.org/10.1080/02813432.2022.2161307)

Saurio, R., Pekkarinen, S., Hennala, L., & Melkas, H. (2023). Exoskeletons – human-centred solutions to support care workers? In: Pfannstiel, M. A. (ed.) *Human-Centered Service Design for Healthcare Transformation: Development, Innovation, Change*. Springer.

Borg, J., Gustafsson, C., Landerdahl Stridsberg, S., & Zander, V. (2022). Implementation of welfare technology: a state-of-the-art review of knowledge gaps and research needs. *Journal of Medical Internet Research*, 18:2, 227–239. <https://doi.org/10.1080/17483107.2022.2120104>

Dyb, K., & Kvam, L. (2022). Beyond the Point of No Return: A Discourse Analysis of Healthcare Professionals' Perceptions of Digitally Supported Person Centred, Integrated, and Proactive Care. *International Journal of Integrated Care*, 22(3): 5, 1–9. DOI: <https://doi.org/10.5334/ijic.6446>

Johansson-Pajala, R-M., Zander, V., Gustafsson, C., & Gusdal, A. (2022). No thanks to humanized robots: attitudes to care robots in elder care services. *Home Health Care Services Quarterly*, 41(1), 40–53. <https://doi.org/10.1080/01621424.2022.2052221>

Zanaboni, Dinesen, Hoaas, Wootton, Burge, Philp, Oliveira, Bondarenko, Jensen, Miller, & Holland (2022). Long-Term Telerehabilitation or Unsupervised Training at Home for Patients with Chronic Obstructive Pulmonary Disease: A Randomized Controlled Trial. *American Journal of Respiratory and Critical Care Medicine*.

Zander, V., Gustafsson, C., Landerdahl Stridsberg, S., & Borg J. (2021). Implementation of welfare technology: a systematic review of barriers and facilitators. *Disability & Rehabilitation. Assistive technology*. DOI: [10.1080/17483107.2021.1938707](https://doi.org/10.1080/17483107.2021.1938707)

Melkas, H., Hennala, L., Pekkarinen, S., & Kyrki, V. (2020). Impacts of robot implementation on care

personnel and clients in elderly-care institutions. *International Journal of Medical Informatics*, 134. <https://doi.org/10.1016/j.ijmedinf.2019.104041>

Pekkarinen, S., Hennala, L., Tuisku, O., Gustafsson, C., Johansson-Pajala, R-M. Thommes, K., Hoppe, J. A., & Melkas, H. (2020). Embedding care robots into society and practice: Socio-technical considerations. *Futures*, 122, 102593.

Øksnebjerg, L., Woods, B., Ruth, K., Lauridsen, A., Kristiansen, S., Holst, H. D., & Waldemar, G. (2020). A tablet app supporting self-management for people with dementia: explorative study of adoption and use patterns. *JMIR mHealth and uHealth*, 8(1), e14694.

Øksnebjerg, L., Janbek, J., Woods, B., & Waldemar, G. (2019). Assistive technology designed to support self-management of people with dementia: user involvement, dissemination, and adoption. A scoping review. *International Psychogeriatrics*, 1–17.

Authors

- ▶ Helinä Melkas
LUT University & University of Agder
- ▶ Satu Pekkarinen
LUT University
- ▶ Riika Saurio
LUT University
- ▶ Christine Gustafsson
Mälardalen University & Sophiahemmet University
- ▶ Rose-Marie Johansson-Pajala
Mälardalen University
- ▶ Viktoria Zander
Mälardalen University
- ▶ Monika Knudsen Gullslett
Norwegian Centre for E-health Research & University of South-Eastern Norway
- ▶ Gunn Hilde Rotvold
Norwegian Centre for E-health Research
- ▶ Eirin Rødseth
Norwegian Centre for E-health Research
- ▶ Laila Øksnebjerg
Danish Dementia Research Centre
- ▶ *In collaboration with* Bengt Andersson
Nordic Welfare Centre

Illustrations: Raquel Benmergui, Raakku
Graphic design: Petri Hurme, Vinkeä Design Oy

Lappeenranta-Lahti
University of Technology LUT

LUT Scientific and Expertise Publications
Tutkimusraportit – Research Reports 150

ISBN 978-952-335-928-4 (PDF)

ISSN-L 2243-3376

ISSN 2243-3376

Lahti, Finland, 2023

The Nordic Research Network
on Health and Welfare Technology:
<https://nordicwelfare.org/en/welfare-policy/welfare-technology/hwtresearch/>

LUT University, Finland:
<https://www.lut.fi/en>

Mälardalen University,
Sweden: <https://www.mdu.se/en/malardalen-university>

Norwegian Centre for E-health Research,
Norway: <https://ehealthresearch.no/en/>

Danish Dementia Research Centre,
Denmark:
<https://videnscenterfordemens.dk/en>

Nordic Welfare Centre,
Sweden: <https://nordicwelfare.org/en/>



The knowledge-building process in a nutshell

This policy brief was produced in the Proactive health and welfare technology for Nordic users and societies (PROTECT) project. PROTECT was a Nordic research networking project, which arranged a workshop series to synthesise and advance Nordic research-based knowledge of proactive health and welfare technology (HWT) at three levels: (1) end users (older-age clients and patients and people with disabilities) and their informal caregivers (micro level), (2) the implementation level from the perspective of professional caregivers and organisations (meso level) and (3) the societal (macro) level.

PROTECT was funded by NOS-HS (The joint committee for Nordic research councils in the humanities and social sciences) via the Academy of Finland and NordForsk. It was coordinated by Lappeenranta-Lahti University of Technology LUT (Finland), and the partners were Mälardalen University (Sweden), the Norwegian Centre for E-health Research (Norway) and the Danish Dementia Research Centre (Denmark). The workshop series was supported by the Nordic Welfare Centre and [the Nordic Research Network on Health and Welfare Technology](https://nordicwelfare.org/en/welfare-policy/welfare-technology/hwtresearch/).

Discussions concerning all three levels enabled us to gain a broad picture. Contributions from the PROTECT workshops were built in collaboration between researchers from many disciplines and a diverse array of stakeholders, such as national, regional and local decision-makers and representatives of care organisations and labour market organisations. By bringing together a large group of Nordic researchers and stakeholders, PROTECT created a unique platform for developing novel frameworks and long-term collaborations. Nearly 200 workshop participants contributed to hybrid participatory workshops that involved national sessions and international online collaboration, presentations and discussions.

Sharing research-based knowledge about similarities and differences in proactive health and welfare technology services, implementation and policies – including challenges in proceeding from piloting to implementation – across Nordic societies enables a better overall understanding of the experiences and expectations of diverse users in individual countries and the region. This, in turn, will help improve policy interventions and innovations to enhance proactive and resilience-supporting health and welfare technology use and the quality of life and work of Nordic citizens and caregivers.