

Healthcare and care through distance spanning solutions

24 practical examples from the Nordic region





*Healthcare and care through distance-spanning solutions
– 24 practical examples from the Nordic region*

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Foreword

With an ageing population and sparsely populated areas throughout the Nordic region, digitalisation and remote solutions are important prerequisites for maintaining the quality of the Nordic welfare model. The need for distance-spanning solutions for healthcare and social care will increase as regions and municipalities in the Nordic region's sparsely populated areas often have strained economies. At the same time, the need for welfare services is increasing and will continue to increase in the future.

We have the technology and the knowledge, and the required infrastructure is in place. The Nordic region has a digitally aware population that wants to help develop the digital services offered within healthcare and social care. At the same time, forecasts indicate that there will be a shortage of staff within healthcare and social care, and that the Nordic countries face a particular challenge when it comes to being able to recruit staff in order for the healthcare and social care sector to continue to work well. On the positive side, the staff are digitally ready. Skills development and further training will be required, but the countries in the Nordic region have all the conditions in place for a successful transition thanks to their high degree of digital maturity.

Healthcare and care through distance-spanning solutions (also known by its Swedish abbreviation, VOPD) is a priority project for the Nordic Council of Ministers within the framework of Sweden's presidency in 2018. Centre for Rural Medicine within Region Västerbotten and the Nordic Welfare Centre are acting as project managers for the work, with the support of the Nordic research institute Nordregio.

In this publication, you can read about 24 digital solutions for healthcare and social care from all the Nordic countries. All the solutions are tried and tested, and are accessible to citizens in various regions and municipalities. By implementing a suitable combination of the 24 solutions you will find in this publication, you can create the conditions to generate High quality, local healthcare*.

The Centre for Rural Medicine and the Nordic Welfare Centre would particularly like to thank the participants in the project's working group, as well as the organisations in each country that have carried out surveys of the 24 digital solutions.

Eva Franzén, Director of the Nordic Welfare Centre

Peter Berggren, General Practitioner and Director of the South Lapland Healthcare Area in Region Västerbotten

* High quality, local health care – A primary care reform, SOU 2018:39

Healthcare and care through distance spanning solutions

This publication is part of the priority project entitled Healthcare and care through distance-spanning solutions, 2018–2020 (VOPD). The project was initiated as part of Sweden's Presidency Programme for the Nordic Council of Ministers in 2018, An inclusive, innovative and safe Nordic region.

The VOPD project is intended to improve the Nordic population's accessibility to good healthcare and social care, wherever they live, and to create the conditions for development and growth throughout the country, not just around our major cities. The description of the assignment from the Government Offices of Sweden provides the following background to the priority project:

"All geographical areas are affected by a number of challenges such as demographics, service, housing, infrastructure, attractiveness, education and employment. It is important to take advantage of the potential that exists in the Nordic countries and to combat increased regional imbalance, as well as to promote economic growth, population development and service. There is a need for innovative service solutions and models to address demographic challenges based on the different conditions affecting regions and communities, particularly in rural areas. New ways of delivering welfare services is one approach. There are good opportunities for joint learning in this area, at a national, regional and local level. The focus is on the benefit to the Nordic region."

VOPD will also present national strategies and methods, with associated tools, for the implementation of distance-spanning solutions. Through two invitations to tender, the project will select businesses to provide consultancy support for the structured implementation of distance-spanning solutions in Nordic municipalities and regions. The project's activities can be followed on the website: www.healthcareatdistance.com

The priority project also covers the sub-project ePrescription across country borders. This takes place under the management of the Swedish eHealth Agency.

Introduction

In this report, we describe 24 digital services for healthcare and care through distance-spanning solutions in the Nordic countries. The examples presented in the report have been selected by the project's Nordic working group. The working group has done this in collaboration with organisations in the respective country that have conducted surveys of digital services. These services are well established and are offered to the population in the region or the municipality in which they live. When selecting the examples, the working group has focused on those services that are considered to have the greatest impact on both citizens as well as the operation, region and municipality, based on the provision of quality health and social care embodying a high level of efficiency. The potential to implement the services in neighbouring countries is also of relevance – and in this respect the implementation methods are of particular importance.

If all the Nordic countries, their regions and municipalities implement the digital services presented in this publication in full, there is a good chance of meeting the demographic challenge facing our Nordic welfare model, above all in sparsely populated areas.

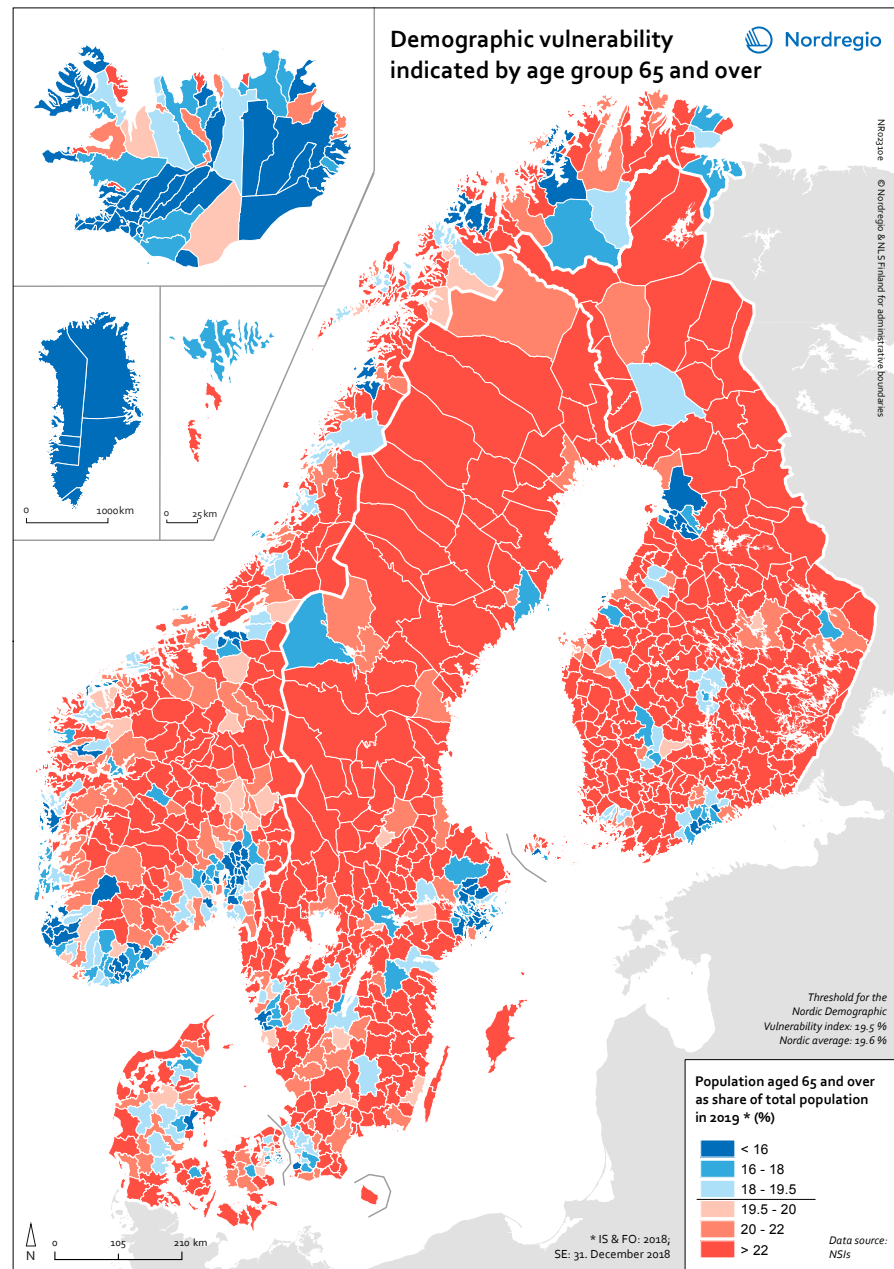
Background

The Nordic welfare model is central to the Nordic countries and provides a good standard of living, as well as offering publicly funded health and social care services of a high international quality. Our model has contributed to life expectancies that are among the highest in the world. However, Nordic countries are facing extraordinary challenges when it comes to providing effective healthcare services for a rapidly growing elderly population.

The ageing population is a global demographic challenge and countries all over the world are facing increased cost for caring for their elderly. The increased proportion of elderly people in the population is resulting in fewer taxpayers to fund healthcare services. At the same time, longer life expectancy is leading to an increase in the proportion of people living with chronic illnesses for longer periods of time. These demographic changes are placing significant demands on healthcare services.

The Nordic research institute Nordregio has developed a demographic vulnerability index indicated by the 65+ age group. The map below presents demographic vulnerability in the Nordic municipalities, based on the excess population in the 65+ age group. The map illustrates the population aged 65+ as a proportion of the total population in 2019. With this indicator,

a municipality is considered to be vulnerable when the proportion aged 65+ out of the total population exceeds 19.5 per cent. Municipalities above this threshold, and which are thereby considered to be vulnerable, are shown in red colours, while municipalities below the threshold are shown in blue colours. The proportion of the population in this age group is above the threshold in approximately 70% of Nordic municipalities. This primarily relates to municipalities in sparsely populated areas.



The above map has been taken from Nordregio's publication *Demographic vulnerability – A common challenge for municipalities along the national border between Sweden and Norway*, Working Paper 2019:1, ISBN: 978-91-87295-73-7,

All geographical areas are affected by a number of challenges, such as an ageing population, the need for services, housing, a lack of infrastructure, attractiveness, education and employment. It is important to take advantage of the potential that exists in the Nordic countries and to combat increased regional imbalance, as well as to promote economic growth, population development and service. There is a need for innovative service solutions and models to address demographic challenges based on the different conditions affecting regions and communities, particularly in sparsely populated areas. New ways of delivering welfare services are an important component.

Digital services for healthcare and social care at distance

Developments have progressed quickly in recent years and there are now a number of well-established services that are available to the whole population; for example, there has been a rapid increase in video meetings with doctors. Private online medical companies, particularly in Sweden, offer nationwide services. Public healthcare providers also have nationwide offers, such as Healthcare Guide 1177 in Sweden.

This publication does not aim to describe these nationwide systems, even though rapid developments are being witnessed in particular in the field of private online medical companies. Here we are describing services that local and regional healthcare providers offer their citizens and that, through digital support, move the point where healthcare and social care are provided into or as close to the home as possible.

The solutions are transferable between municipalities and regions, as well as between the Nordic countries. Working on the basis of sparsely populated areas, this publication mainly covers solutions for citizens with chronic diseases, which, in combination with old age, mean that the target group is often in contact with several healthcare and social care operations, such as specialist care, primary care, home care and home help. The target group often has a considerable need for contact with care, with continuity being an important quality factor.

The nationwide systems also play an important role in sparsely populated areas, for example with private online medical companies contributing to increased access to healthcare. There are also examples of solutions that combine nationwide services with regional and local offerings. At the same time, there is significant potential for innovation in terms of combining nationwide care services from the private and public sectors with local and regional offers to citizens. This is especially true in sparsely populated areas, which often have high vacancy levels within healthcare and social care.

The digital services for healthcare and social care at distance that are presented are all well established and are offered to the population in the region or municipality where they live. A number of the services are available with different local and regional variations in several Nordic countries.

In order to clarify the function of the services and their target group, the project has divided them into four different categories, each of which is presented in a separate chapter in this publication. The categories are:

1. **Distance treatment – treatment at distance.** This refers to telemedicine, treatment and advice through online tools and self-treatment. This mainly relates to healthcare.
2. **Distance monitoring – monitoring at distance.** This refers to sensors, cameras, reminders and data collection. This mainly relates to social care.
3. **Distance meetings – meetings at distance.** This refers to all kinds of meetings, both between professions and between citizens and professions.
4. **New digital services for healthcare and social care.** This category is based on finding innovative new solutions, in the form of both private and public collaborations, a new national infrastructure for digital services and new service models where citizens can also assume greater responsibility.

The categories are presented in greater detail in their respective chapters.

Working group and method

This section describes how the distance-spanning solutions presented in this publication have been selected, as well as how the work has been established through a working group and the priority project's steering committee.

The priority project's steering committee, which includes members from departments concerned and/or authorities in all the Nordic countries, appointed a working group made up of experts from Nordic authorities that are working on distance-spanning solutions for healthcare and social care. The working group, alongside the project management, the Centre for Rural Medicine and the Nordic Welfare Centre, appointed suitable organisations in the Nordic countries to conduct a survey of existing solutions for healthcare and social care at distance. The working group includes representatives from:

- The National Board of Social Services, Denmark
- The National Institute for Health and Welfare, Finland
- The Finnish Society for Telemedicine and eHealth
- The Ministry of Welfare, Iceland
- Norwegian Municipal Association (KS), Norway
- The National Board of Health and Welfare, Sweden
- The Swedish Agency for Participation, Sweden.

The description of the assignment from the Government Offices of Sweden states: "The project will gather experiences and good examples, as well as investigate whether there is a need for a long-term collaboration structure with relevant actors at both a local and a regional level in all Nordic countries."

The survey was based on local or regional solutions that are available to the citizens of our Nordic countries. In total, several hundred solutions were identified.

Both the working group and the organisations conducting the survey participated in a workshop on 14 March 2019 at the Nordic Council of Ministers in Copenhagen. Together, they prioritised the 24 solutions for this publication by applying the following selection criteria:

1. An open and accessible service for citizens, locally or regionally
2. Used in or suitable for use in sparsely populated areas
3. Increases opportunities for patient-centred healthcare or social care
4. The solution is capable of being implemented, with associated methodology
5. Contributes to an increased level of availability for the service
6. Contributes to an increased level of freedom for citizens through the service
7. Contributes to an increased level of security for citizens through the service
8. Other specific values, such as cost-effectiveness and increased capacity to act for citizens.

These 24 solutions, along with some 19 additional solutions, are also published in PDF format on the website for the priority project: www.healthcareatdistance.com.

This publication sorts the surveyed solutions into four different categories: distance treatment, distance monitoring, distance meetings and new digital services for healthcare and social care.



CATEGORY 1

Distance treatment

Solutions described in the distance treatment section are linked to advice via online tools with associated treatment or self-treatment. Most solutions relate to the healthcare sector, with online connection between patients and care services.

The solutions are examples of local care concepts and move the point where healthcare is provided closer to or into citizens' own homes. All solutions are available and constitute an open service for citizens within the geographical area in which they are implemented. All solutions are considered to be transferable between regions and between municipalities, as well as between Nordic countries.

The described solutions linked to the distance treatment category are a selection taken from a larger study of Nordic solutions for healthcare and social care at distance. Many of the solutions in this section have similar features, but have been described here on the basis of their more distinctive characteristics.



CATEGORY 2

Distance monitoring

Solutions described in the distance monitoring section cover both healthcare and social care, with the primary focus on digital supervision for safety and security for the elderly in municipal care. A number of the solutions can be described as distance social care using sensors, cameras and reminders. All solutions are available and constitute an open service for citizens within the geographical area in which they are implemented. The solutions are considered to be transferable between municipalities, as well as between Nordic countries.

The described solutions linked to the distance monitoring category are a selection taken from a larger study of Nordic solutions for distance healthcare and social care. Many of the solutions in this section have similar features, but have been described here on the basis of their more distinctive characteristics.



CATEGORY 3

Distance meetings

Solutions described in the distance meetings section are linked to various types of distance meetings between healthcare and social care. The target groups are care recipients and occasionally also their relatives.

The solutions are examples of local care concepts that move the point where healthcare is provided closer to or into citizens' own homes. Some of these solutions create opportunities to involve relatives in care meetings, even though they may be in a different geographical location. All solutions are available and constitute an open service for citizens within the geographical area in which they are implemented. We consider that solutions are transferable between regions and between municipalities, as well as between Nordic countries.

The described solutions linked to the distance meetings category are a selection taken from a larger study of Nordic solutions for healthcare and social care at distance. Some of the solutions have similar features, but have been described here on the basis of their more distinctive characteristics.



CATEGORY 4

New digital services for healthcare and social care

The solutions described in the section on new digital services for healthcare and social care cover innovative new solutions, a new national infrastructure for digital services, as well as service models where citizens can also assume greater responsibility.

The solutions are examples of concepts that move the point where healthcare and social care are provided closer to citizens. The solutions are available and constitute an open service for citizens within the geographical area in which they are implemented. We consider that solutions are transferable between regions and between municipalities, as well as between Nordic countries.

The described solutions linked to the category for new digital services for healthcare and social care are a selection taken from a larger study of Nordic solutions for healthcare and social care at distance.



Distance treatment



Sweden
Denmark

Virtual health rooms offer faster diagnosis and treatment

People living in sparsely populated areas usually have to travel long distances to obtain care or even just to have their blood pressure checked. For them, unmanned health rooms are one step closer to care, because they avoid long and costly journeys to health centres or hospitals. Virtual health rooms can be found in sparsely populated municipalities in Västerbotten County in Sweden and in the northern parts of Denmark.

As access to public transport is limited and the quality of the roads is sometimes poor, some groups in society do not seek medical help unless they have extremely urgent needs. This can result in both higher costs for the required treatment and a lower quality of life for the patient. The purpose of both the Swedish and the Danish services is to bring care closer to citizens.

The Swedish concept makes it possible for patients to monitor their own health by offering several different opportunities to provide samples, with or without help, in a location close to their home. The results of most of the tests are transferred directly to a database, without having to be entered manually into the system. Video consultations can be conducted between patients and healthcare professionals.

The Danish solution focuses more on distance consultation between patients and healthcare professionals in a hospital via a video conference system, with the potential to carry out basic test measurements. The cost of the solution depends on the type of equipment needed in the room. An approximate price for the installation in Västerbotten County is SEK 200,000. A similar, newer solution in Denmark cost DKK 190,000. Unmanned health rooms in sparsely populated communities reduce the need for travel, at the same time as allowing patients to monitor their own

health from home with easy-to-use medical equipment. Many types of care visits to a nurse or doctor can be performed through video communication. This can also help to relieve some of the load on municipal home care, as it will not be necessary to make as many trips to the area compared to an area where there are no unmanned health rooms.

The most common users of the unmanned health rooms are patients who need to undergo medical tests and patients in need of medical consultations that can be performed by means of a video call. Scheduled medical visits in a virtual health room are conducted in the same way as if the patient were visiting a hospital or health centre. The patient receives a letter with an invitation to an appointment



Benefits for the patient

- Increased access to health and medical care, making care fairer within the region.
- Shorter time until diagnosis and possible treatment.
- Fewer journeys, with a positive impact on finances, time and safety.
- The health rooms fulfil a social function as they can become a natural meeting place when staff are in the room.
- Patients do not need to buy their own medical equipment, such as blood pressure monitors. Instead, they can share the equipment with other members of the group.



Impact on the operation

- Patients with more serious health conditions can be offered more time, as other patients can monitor their own health to a greater extent.
- Lower costs for patient travel.



Benefits for society

- Positive impact on the environment due to fewer journeys.
- Other organisations can also make use of the room and the technical equipment.



Prerequisites for successful implementation

Telemedicine solutions in sparsely populated areas must be supported by the people who live in the area, as otherwise they will not be used. It is therefore important to involve the local community from an early stage of the process. There is also a need for good cross-sectoral cooperation between all the organisations involved in the process. Healthcare professi-

onals may need to get used to meeting their patients via a video link. Healthcare providers, both from the region and the municipalities, must reach agreement and collaborate with regard to implementation. The technical equipment in the room should be selected with care and must be extremely intuitive to use, even for beginners. However, some form of introduction may be required in order for people to be able to use the medical equipment. Video communication requires high-quality network access.



Follow-up and evaluation

Some evaluations of the unmanned health rooms have been carried out, but further evaluations are required. An evaluation framework has been drawn up and will be used in future studies.

Users' comments

"The first time I went to the virtual health room in Slussfors, I sat on a chair and we went through the initial tests. But you're diabetic, the nurse told me. What could I do, other than to say: Thank you for telling me. That's life."

Patient in Sweden

"I asked the questions I was expected to ask and changed the things I was expected to change. I have complete confidence that the system works, and I no longer needed to go to the health centre afterwards."

Patient in Denmark.

"For me, it makes no difference if the doctor is physically present or if we are communicating through a screen. The most important thing for me is that it is the same health professional who knows me, my illness and the course of my treatment."

Patient in Danmark



Conclusion

Unmanned health rooms are suitable for sparsely populated regions where the nearest health centre or hospital is far away. However, health rooms can also be established in more urban areas as a way of relieving the load on primary care or even on the casualty department in a hospital. Giving patients the opportunity to monitor their own health frees up more time for patients who really need physical visits.

Iceland

Lifeline can provide assistance in times of need when the distances are too large

In remote areas, situations can arise where immediate medical care is required to help and diagnose people in need. The Lifeline solution is a service that links the crews of offshore vessels with doctors at Akureyri Hospital, Iceland. On board there is equipment for performing ECGs, measuring oxygen saturation, blood pressure, blood glucose and temperature, as well as a remote-controlled camera with a large optical zoom function to enable the doctor to evaluate the situation visually in real time.

In remote areas, such as at sea, situations can arise where immediate medical care is required to help and diagnose patients. When there are no healthcare professionals on board, it can be difficult for the crew to describe the patient's condition at the same time as assessing whether the ship needs to return to shore, whether the healthcare situation can be handled on board or whether a helicopter is required to collect a patient.

The Lifeline solution employs an encrypted secure connection, with data collection directly to the national electronic health record (EHR) system. When it is used on board a ship, the system has been incorporated into the satellite network used by Icelandic shipping to provide a high priority and reliable connection. The solution can also be used in other remote locations with 3G/4G or xDSL services and with various cameras and other equipment for secure support. The service means that healthcare professionals have constant access to accurate data, enabling them to evaluate situations and make the right decisions. Remote specialists have a crucial role to play when it comes to making decisions on the basis of real data, at the same time as having a visual overview of the situation.

At present, Lifeline is mainly used by crews on offshore vessels and specialists at Akureyri Hospital. The solution must be implemented in full and there must be staff on board who have received training in how to use the equipment. The biggest challenge is being able to establish a network connection that is secure and free of faults.

The cost of the monitors, camera and computer for each location is approximately SEK 42,500. The variable costs have not been determined, but will in future form part of the vessel's communication costs..



Beneficial effects

- The solution makes it possible to achieve secure communication between patients and health professionals, as well as between health professionals.
- Data, including video data, can be gathered and saved directly in patients' electronic records.
- Lifeline can be used to improve the quality of healthcare in remote areas, as well as being introduced in areas where such care was previously absent.



Prerequisites for successful implementation

The solution must comply with laws and regulations governing the management of healthcare data. Once the solution has been approved as being secure, it can start to be used once an agreement has been entered into between the service provider (Siminn) and the healthcare institute. The solution may be used anywhere. All it requires is a stable and secure data connection.



Follow-up and evaluation

Preliminary data is available and a follow-up will be carried out by means of questionnaires that are sent to patients and health professionals working with the service.

Users' comments

"The crew members on these ships have shown considerable interest in conducting regular examinations and are very interested in this solution. Receiving support other than conventional phone calls is a big step for them. Previously, it was sometimes not even possible to make a call in the event of an emergency. These users are well aware of the distances and difficulties involved in accessing real help in an emergency. As a result, they really take their role in the project seriously."

Developer of the satellite network used on board

Iceland

AGNES – health clinic with telemedicine

Kirkjubæjarklaustur is a small town in southern Iceland with 600 inhabitants. The health clinic is responsible for a large, sparsely populated area, which is also visited by a large number of tourists each year. It has been difficult to recruit doctors to the municipality and short-term contracts have proven to be very costly. Since 2013, the health clinic in Kirkjubæjarklaustur has had access to special telemedical equipment.

Kirkjubæjarklaustur was looking for new ways to improve services and access to health care. The result was telemedicine. AGNES is an online telemedicine programme that makes it possible for remote healthcare providers to gather and share medical data and to exchange documents in real time, as well as to participate in video conferences. The clinic in Kirkjubæjarklaustur currently has one part-time doctor and one full-time nurse, as well as a secretary. When the doctor is not on site, the other staff members can contact the doctor by phone or using telemedical equipment. This has resulted in much more secure communication and consultations between the nurse and the doctor regarding individual cases.

The clinic at Kirkjubæjarklaustur has telemedical equipment in the form of digital HD cameras for examinations of the ears, throat and eyes. A vital signs monitor, an ECG, a respiratory monitor, a dermatology camera and a digital stethoscope are also part of the solution. The equipment makes it possible for the nurses at the clinic to contact a doctor for observation and diagnostic purposes. Local access to clinical specialists such as psychologists or medical sub-specialists is limited, and AGNES can help fill such gaps in patient care.

The health clinic previously had a full-time nurse during the daytime. A doctor was on call all year round, except when he or she was on holiday – at which point there were no contingencies for emergencies. In event of an accident or emergency after the end of the day shift, it was necessary to request assistance from the neighbouring region, some 70–130 km away.

The equipment was funded by local charities and has saved travel costs by allowing patients to be treated locally; previously, they had to be referred to the nearest hospital, 200 km away. The cost of the equipment varies between 3–5 million Icelandic krona. The cost of the training is negligible. It's easy to learn how to use the equipment.

It is mainly citizens and healthcare workers in the southern healthcare district who use AGNES. The equipment is used for all age groups.

AGNES is not yet part of the standard range of services in the care system. Matters relating to remuneration and some legislative issues remain to be resolved.



Benefits for the patient

- Increased access to health care that was not previously available.
- Fewer or shorter hospital stays.
- Reduced travel time and reduced need to take time off work.
- Reduced costs for travel and transport.



Impact on the operation

- Greater influence for healthcare workers in the district.
- Reduced costs for travel and transport for healthcare workers.
- Reduced costs for health care in general.
- Increased efficiency through better management of chronic diseases.
- Common health professionals.



Prerequisites for a successful implementation

Education and training should take place in an integrated development environment in order to change an established culture, both among health professionals and patients. Information, courses and teaching about the technology should be included in the medical syllabus to make it easier to change the general attitude of clinical specialists.

Changing the legislation and regulations is of the utmost importance in order to benefit from the technology. Data gathering must take place within the framework of the rules and regulations that apply in Iceland and in GDPR. The use of telemedicine must be integrated and coordinated. Each health clinic must itself decide on and agree to the implementation of eHealth services. In Iceland, the Ministry of Health has stressed the importance of implementing e-health solutions. The payment solution needs to

be designed so that it is possible to charge for the service. Icelandic law prohibits the collection of payment for telemedicine unless the patient visits the clinic.



Follow-up and evaluation

The project is still in progress, mainly due to various technical and security-related issues. This is groundbreaking work in Iceland, and has been presented to politicians and other health clinics in sparsely populated areas. There is an agreement between the southern and eastern health-care regions to extend the use of the solution.

Users' comments

"I want to use the new machine."

Patient



Conclusion

The increased quality and security for the patients is apparent. Greater influence for local healthcare professionals is also making it possible to achieve more efficient teamwork. Patients and residents have a very positive attitude towards IT solutions.

The equipment is user-friendly and can be managed easily after just a few days of training. Collected data is automatically sent to the national EHR system and is available in most healthcare institutes in the country. The solution can be easily used in all areas where 3G or 4G is available. Normal use of WiFi is not permitted for security reasons.

Trappa – an online speech therapy clinic

For a number of years, there has been a shortage when it comes to psychology and speech therapy specialists in Iceland's sparsely populated areas. Accessing these services has been a challenge. Since 2014, Trappa, a speech therapy clinic, has specialised in online services across the whole of Iceland. Trappa offers speech therapy, teaching, language learning assistance and consultation through the online Kara Connect solution.

Kara has been designed to meet the needs of specialists – bearing in mind that the services need to be accessible regardless of where the patients live. The target group for Kara Connect Trappa's work initially comprised children, and has now been expanded to also include older people with speech difficulties.

By having internships in sparsely populated regions via a video communication platform, it is possible to overcome some of the isolation of the citizens as well as their lack of access to specialist treatment.

The Trappa project was launched in a small village in remote Westfjords, initially focusing on a few children in the primary school. It soon became apparent to those responsible that the children had pressing needs. The project was able to help the children to gradually overcome their difficulties.

Various complex payment solutions previously constituted an obstacle to services. In addition, distances are large and public transport is not always available due to the poor weather conditions in Iceland throughout the year. This solution makes it possible to manage needs and help people in society. The biggest challenge is to ensure that the communication is secure. Those who use the service are speech therapists, psychologists, customers and staff in schools and municipalities. The costs are based on the cost of treatment. This saves time and travel expenses.



Benefits for the patient

- Easier to gain access to specialists.
- Reduced travel costs.
- Fewer disruptions in children's day-to-day lives.
- Prerequisites for successful implementation.
- The solution requires a secure online platform and is easy to use; it only needs a computer, speakers and microphone equipment.

Users' comments

"The main advantage is that my child receives help from a specialist that would otherwise not be available. The service is unaffected by road conditions, the weather or distance. This is an enormous advantage."

Parent of a child who needs speech therapy

Telemedicine helping people manage their COPD at home

People who live with chronic obstructive pulmonary disease (COPD) need to manage their condition for many hours during the day. This may be associated with a high degree of uncertainty, and patients often have to be admitted to hospital. A national telemedicine solution makes it possible for people with COPD to measure their values at home and send the readings to municipal health professionals, who can monitor the course of the illness, take action and provide support.

Since 2016, an agreement has been in place in Denmark regarding a nationwide expansion of telemedicine, known as Telekit, for residents with COPD. The idea behind this expansion is for patients to receive assistance in monitoring their illness at home, so avoiding having to visit their doctor or hospital. This ensures a better quality of life for the individual. Patients measure their oxygen saturation, heart rate, blood pressure and weight at home each week. Questions about the status of the illness are entered through the device, and the results are sent wirelessly from the device/tablet to health professionals in the municipality or at the hospital.

As COPD progresses, many sufferers are forced to be inactive, which leads to the patient both losing muscle mass and noticing a weakening of their muscles. Many patients with moderate COPD consequently have significantly weaker muscles than healthy people of the same age. Osteoporosis (brittle bones) is a common consequence of COPD. COPD patients also often suffer from heart disease and lung cancer. This multimorbidity makes it impossible to achieve a sufficiently effective outcome for the patient, including treatment with medication.

Those who use the Telekit system are citizens with COPD. The following criteria have to be satisfied in order for citizens with COPD to be included in telemedical treatment of the condition:

- COPD is diagnosed through an examination of the lungs, known as spirometry.
- The patient has several symptoms and their COPD has deteriorated or has led to them being hospitalised on two or more occasions in the past year and/or needing treatment with oxygen.
- The patient is already receiving treatment or treatment is justified.
- The patient has a permanent residence and is registered with a GP in the region. There may be local deviations by agreement.
- The patient is interested in participating – in relation to the technical application and the health professionals – and is expected to be able to understand and act on the basis of their own readings in the long term.
- The estimated cost saving for the target group amounts to DKK 483 million over five years. In the event the solution is implemented in full for everyone with a diagnosis of COPD, the saving is estimated at DKK 202 million per year.



Beneficial effects

- Telemedicine produces positive effects, both for the health of the individual and from a socioeconomic perspective, as the system requires fewer consultations and hospitalisations.
- Results from the supplier show that as many as 71% of citizens experience a greater sense of security when using telemedicine, and 26% say they experience greater freedom because they can take the measurements themselves.
- The results also show that telemedicine contributes to citizens' understanding and management of their own illness. In all, 61% of citizens stated that they experienced increased control over their illness, as telemedicine makes it possible for them to react when their illness worsens, and that as a result they are becoming more aware of their symptoms.
- By moving the treatment to the patient's home, they avoid having to travel, which can be exhausting for people with COPD.
- Quality of life decreases as the patient's illness deteriorates. However, quality of life decreases less for patients who are using the solution compared to those who are not.



Prerequisites for a successful implementation

In Denmark, where the solution is being implemented, it is necessary to obtain consent for treatment with telemedical support and for the transfer of contact details of partners. The responsible doctor is obliged to register all relevant information regarding details and consent, including the handover of health information etc.

It is important to know who is responsible in order to start treatment. In Denmark, this is usually the municipality, although it could also be the hospital.

The framework for skills development and education must be included from the outset. The education and supervision of citizens in conjunction with starting up and the ongoing monitoring of telemedical data requires that the healthcare workers responsible for checking the citizens' measurements in municipality at the hospital possess the relevant expertise.

It is important for health professionals to be familiar with the patient's user interface and the most common problems that patients encounter, such as logging in, charging the equipment, changing the batteries, etc. The technical design and the equipment used for telemedical treatment

options may vary locally. It is important for the technical design to support citizens' care routines, as well as for citizens to have somewhere to go to ask questions. The solution must be flexible when it comes to dealing with other illness groups.



Follow-up and evaluation

The municipality is generally responsible for follow-up. The patients' measurement data is monitored systematically at pre-arranged intervals. In the event of any abnormalities in the data indicating a negative disease progression, the patient is advised to contact their doctor or, in accordance with the self-treatment plan, to initiate treatment or change their treatment.

The doctor conducts regular assessments of the patient's illness and general condition, as well as possible concurrent diseases. Telemedical measurements can serve as an important complement in this respect. As a result, it may be a good idea for the patient to bring along his or her tablet containing measurement data during doctor's appointments. It is also important for there to be continual communication between the municipality and the general clinic and vice versa.

Continual monitoring of the effects of the telemedicine solution is also important. The monitoring should be systematic and cross-sectoral to ensure that the patient does not use the solution unless it is beneficial to them.

Users' comments

"Every Monday morning, I take out my Telekit and measure my blood pressure, oxygen saturation and heart rate, and I weigh myself. Then I do some exercises. If there are any problems with the values, I know that my home nurse Birthe or one of the other helpful nurses will call straight away. And if there is any need to change my medication, I'll hear from the doctor. We try to avoid catching colds and the like, so that I don't have to be admitted to hospital. I'm really happy that I've received a Telekit. It gives me a sense of security, and that's important!"

Connie, COPD patient



Conclusion

The telemedical solution for patients with COPD was first tested in the northern region of Denmark. It has now been decided that the solution will be rolled out to the rest of the country by the end of 2019.

Internet psychiatry provides good help for anxiety and depression

The number of people with mental illnesses is increasing. Internet psychiatry is a tool that can help prevent people with mild mental illnesses from developing severe mental illnesses. Results indicate that there is no difference in treatment outcomes between Internet psychiatry and traditional therapy, where patients meet a psychologist in person.

Internet psychiatry is a nationwide, free treatment option, where people can receive treatment for anxiety and depression over the Internet.

Internet psychiatry means that people can get help from a professional practitioner in their own home. They can both receive treatment and take a course when it suits their schedule. The patients follow the course in stages, starting a new stage about once a week. If the patient is not actively following their course, they will be contacted by their psychologist.

The definition of Internet psychiatry is the use of video consultation for contact between patients and therapists. Internet psychiatry and mental e-health are a form of support and treatment that uses digital technologies such as video, web applications, websites, apps, sensor technology and virtual reality (VR).

The individual answers a questionnaire, which is reviewed by a psychologist. The psychologist makes an assessment of whether the person belongs to the target group for the type of treatment that Internet psychiatry can offer. The patient and the treatment provider communicate via video calls and text messages. The connection is secure, and nobody other than the patient and the treatment provider can view the data.

Treatment is carried out via a shared platform. The patient must follow a number of treatment stages with accompanying daily exercises. During the treatment, the patient learns to work on their thinking patterns. The course lasts for ten to twelve weeks and is based on cognitive behavioural therapy.

The users are individuals who have been diagnosed with panic disorder, social anxiety, individual phobias or light to moderate depression from the age of 18 or older.

Internet psychiatry is not suitable as treatment method for people who are simultaneously receiving psychotherapeutic or psychiatric treatment or have been diagnosed with:

- Schizophrenia, bipolar disorder or related conditions
- PTSD or obsessive-compulsive disorder
- Alcohol or drug abuse

The cost is the same regardless of whether the patient and the psychologist meet face-to-face or through a screen. It is likely that the service will contribute to more people with symptoms seeking treatment at an early stage, as it minimises the stigma and other obstacles associated with visiting a doctor. Patients can also register whenever they want.



Benefits for the patient

- The solution is less costly for patients, as they don't have to spend time travelling and they don't have to take time off work.
- For some, being able to get treatment at home entails significant benefits. They don't have to take time off work or impose other restrictions on their day-to-day lives.



Beneficial effects

- The impact of Internet-based psychological treatment for anxiety disorders and depression is particularly effective as a distance psychiatric service using information and communication technology. Evaluations indicate that there is no difference in treatment outcomes from traditional therapy, where patients meet a psychologist in person.
- The workflow for treatment providers will change and they will have to get used to seeing and treating patients in different ways. Experience shows that this is fairly simple and that treatment providers can see the benefits of changing traditional treatment methods for some patients.



Prerequisites for a successful implementation

Both the patient and the healthcare provider need a computer or tablet with WiFi access in order to use the solution. The patient is granted access to a computer program that includes exercises. The technical requirements must be satisfied, such as ensuring that the connection works and that it is secure to use.



Follow-up and evaluation

After ten to twelve weeks of treatment, follow-up is performed by means of a video call between the patient and the treatment provider. The patient's doctor receives information about the treatment and the state of the patient's health.

Users' comments

"It has been a really really good process, and I have been really happy with it. I have received a number of helpful tools, including some that I am still using. I have been able to see great benefits (editorial team: by being able to receive the treatment at home), including that it hasn't impacted on my work and my working time – I have been able to do it when it suited me. I have had bad days, for example when I haven't had a bath and washed my hair, but I have still been able to sit at home and take the course, without having to go outside and hide away a little, because my hair was a bit greasy and maybe I wasn't very fresh as I hadn't had a bath."

Lone, Internet psychiatry

"The technical solution is actually just like using Skype. You turn on your computer and click on the icon, and then you call up the patient in question – it's that simple. And one of the advantages of the patients being at home is that I can see exactly how they are doing when they are relaxed, compared to when they come to visit me, when they may have done their hair and smartened themselves up, and maybe put on a little make-up. When they are at home, I can see what their home looks like and exactly how they are looking and how things are going."

Lene, nursing department



Conclusion

Internet psychiatry can be used in any situation where people have access to a computer and a good Internet connection. A psychologist makes an assessment of whether the patient belongs to the target group for the type of treatment that Internet psychiatry can offer.

Norway

Skype may be the way to obtain good help for anxiety and depression

Obsessive-compulsive disorder (OCD) can be one of the most debilitating mental illnesses for a person. The illness frequently causes a great deal of discomfort and functional limitations. In Norway, an OCD team in Northern Norway uses an effective method of treatment called exposure with response prevention (ERP). This is a four-day intensive treatment via Skype for business.

In 2009, the Minister for Health and Social Care in Norway conducted an initiative to make ERP available to people suffering from obsessive-compulsive disorder. Treatment teams have been established in all health companies and healthcare districts in Norway.

The OCD team at the adult psychiatric outpatient clinic at the University Hospital of Northern Norway (UNN) offers a four-day intensive ERP treatment via Skype to adult patients with obsessive-compulsive disorder from all over northern Norway. The intensive treatment itself comprises two days of exposure therapy to change the way patients experience unpleasant thoughts and feelings, so that they can live in a way where compulsion is no longer an obstacle. After four days of treatment, the individual patient will be performing exposure tasks independently, which are reported on a daily basis to the OCD team. The team will assist with quality assurance for up to one year after the treatment.

Northern Norway's regional health authority has provided Skype for Business and the required equipment for all employees.

The team has considerable experience of treating patients with obsessive-compulsive disorder using Skype. In 2018, the team switched from a classic, individual patient course comprising 15 sessions over a three-month

period, to intensive ERP treatment over four days. The intensive treatment has been shown to produce better results than the previous extended treatment. Today, most OCD teams in Norway prefer the four-day treatment.

The four-day treatment was originally designed by the OCD team at Haukeland University Hospital in Bergen (Helse Vest). The psychiatric care and substance abuse clinic at the University Hospital of North Norway is authorised to offer this treatment, and was the first in the country to be able to offer treatment via Skype.

The people who use the service comprise a patient group at UNN who have been diagnosed with obsessive-compulsive disorder. They cover a wide age range, between the ages of 18 and 60. Norway estimates that around 1% of the population suffers from obsessive-compulsive disorder.

The Child and Adolescent Psychiatry Clinic at UNN also diagnoses and treats patients with mental health problems in the region. The clinic collaborates with children's families as well as with primary care, public health nurses, schools, child welfare authorities and other hospital clinics.



Beneficial effects

- Better quality. The main purpose of the new intensive treatment is to be able to offer patients higher quality care. The treatment has proven to be effective for this condition. For patients with obsessive-compulsive disorder, the treatment is usually most effective in their home environment.
- Equivalent outcomes. The outcomes using Skype treatments are just as good as those achieved with traditional treatment methods.
- Cost savings. Significant savings can be seen in terms of travel expenses as the treatment is carried out at home. Northern Norway is a large geographical area with long distances and high travel costs to UNN or to district psychiatric clinics.



Prerequisites for a successful implementation

The team at UNN has had experience of treating patients with obsessive-compulsive disorder using Skype since 2013. An easily accessible technical solution for video conferences is necessary in order to adapt to services of this type on a large scale. Skype for Business is the technical solution that is used to provide the service.

Northern Norway's regional health authority provides Skype for Business and the required equipment for all employees for administrative purposes. Guidelines regarding the clinical use of Skype for Business will be laid down. This is necessary in order to specify how patient confidentiality can be satisfied during video conferences.



Follow-up and evaluation

The OCD team in Tromsø conduct a follow-up interview with all patients three months after completion of the treatment.

Users' comments

"We serve patients from across the whole of northern Norway. They are now able to avoid long journeys, and can carry out their treatment from home. They view this as extremely positive. Relatives are also included as part of the treatment offer."

Lene, psychology specialist



Conclusion

The service described is a specific method of treatment for adults using Skype. Another video communication service that has been implemented at UNN is Skype for distance psychiatric treatment for children and adolescents.

Norway

A tablet that enables video communication helps individuals with kidney disease to perform dialysis at home

The dialysis unit at the University Hospital of Northern Norway (UNN) introduced home dialysis in 2011. Kidney patients can perform dialysis themselves at home, either manually or using a machine. The solution consists of tablets equipped with video communication, which are installed in the patient's home, at the home help facility and in the hospital.

The idea of video communication links for kidney treatment is to bridge the geographical gap, link skills between staff in regional hospitals and those in primary care, reduce costs and, above all, provide care locally for patients, thereby giving them the opportunity to manage their condition at home.

The dialysis unit at UNN considers that home dialysis is a good way to improve patients' quality of life, give them more control over their lives, limit the amount of travel they have to do, restrict hospital stays, normalise their day-to-day lives and make them feel healthier. Home dialysis is also considered to be a way of managing cost cutting demands, since dialysis at hospital is a very costly option.

The University Hospital has experience of providing teledialysis services to six external dialysis units in Northern Norway that do not have kidney specialists. Since 2002, the service has been extended to patients' homes. The most important target groups are adults with peritoneal dialysis (PD, also known as abdominal dialysis) and haemodialysis (HDD), where the blood is purified outside the body.

Patients perform peritoneal dialysis in their own home. The treatment can be carried out in two ways:

1. Through manual exchange by hand, known as continuous ambulatory peritoneal dialysis (CAPD). This is the most common method. The patient fills their abdomen with a dialysis solution and then empties the fluid. The fluid enters and leaves the abdomen through a hose by means of gravity. The patient may need to perform three to five exchanges a day.
2. Through automated peritoneal dialysis (APD) via a machine. A machine handles the exchanges at night while the patient is sleeping. The treatment takes seven to ten hours.

With haemodialysis, the patient connects and disconnects the machine themselves and takes over the function of the nurse to a large extent. This treatment requires a high level of commitment on the part of the patient, as well as requiring investment in training and the installation of equipment in the patient's home.

This system is used by patients with kidney failure who require regular dialysis treatment in two possible ways: peritoneal dialysis and haemodialysis.



Benefits for the patient

Patients with peritoneal dialysis:

- Video communication can be used to check the configuration of the dialysis machine.
- Assistance in event of alarms and troubleshooting.
- Help if an infection is suspected (assessment of the colour of the liquid).
- Guidance in the event of catheter problems.
- Assessment of general conditions, fluid balance, depression, etc.

Patients with haemodialysis:

- Increased confidence and sense of security when health professionals are available during the treatment.
- Video communication can be used to control the installation of the dialysis machine before starting treatment.
- Help with cannulation or connecting a dialysis catheter.
- Instructions in the event of alarms.

- Guidance on medical issues, such as changes in blood pressure (ultra-filtration or water absorption).
- Increases the patients' confidence and sense of security with regard to their own assessment capacity. The patients' own power and expertise can increase.



Benefits for society

In general, the home dialysis service has the following positive effects:

- Provides equal access to dialysis treatment in sparsely populated regions.
- Combines the skills of staff in regional hospitals with those in primary care.
- Helps patients to manage their condition at home while maintaining quality of life.
- Reduces the need for patient travel and ensures more frequent and continuous treatment.
- Reduces the travel time for specialists, thereby freeing up resources.
- Reduces the cost of patient transport.

Benefits for health professionals

- Time and cost savings for health care.
- Regular VC meetings also help to combat professional isolation among distance-working nurses in primary care, as well as making it possible to make joint decisions on patient care.
- Nurses in primary care experience greater security when receiving guidance, training and instructions from the hospital via video communication.
- Knowledge transfer from the hospital to primary care.
- Hospital staff feel more confident about the guidance they are offering when they can see the patient and obtain an adequate overview of the situation.
- Primary care nurses experience major differences between communication by phone and video communication, which gives a sense of proximity and greater relevance in terms of the information that is exchanged than is the case by phone.



Prerequisites for a successful implementation

The patient receives assistance from health professionals at the hospital or from the primary care nurse. The solution is used for home visits, checks, follow-ups and treatment.

It is important to establish procedures for communication and interaction between the patient, primary care and the dialysis unit at the hospital. Training in the use of video communication, both at home and in the hospital, is another prerequisite.



Follow-up and evaluation

Once the patient has completed the treatment, contact with the therapist ends. The therapist calls the patient and books an appointment to summarise how the treatment has been conducted and how it has worked. The patient is granted access to all text and assignments in the programme for six months.



Individuals with kidney disease in Akureyri avoid travelling 400 km to the capital to receive dialysis

Since 2015, patients at Akureyri Hospital who need dialysis have been able to visit their local hospital for treatment instead of travelling to Reykjavik 400 km away.

Before 2015, it was only possible to receive dialysis treatment at Iceland's national university hospital in Reykjavik. For patients in the northern region, this entailed travelling by air three or more times a week, which was both expensive and time-consuming, as well as stressful for the patients during the winter when the weather conditions could disrupt the timetables.

Akureyri Hospital uses two dialysis machines and can receive and treat four patients a day. The nurses have received special training at Iceland's national university hospital, and take care of the patients before, during and after their treatment. They make contact with the kidney specialists via Skype to discuss conditions and further treatment. The patients also take part in these meetings if necessary. A laptop is available by their treatment station. This makes it possible for them to see and talk to the specialist.

All travel costs for the patient in Iceland are funded by the healthcare service. This solution saves these costs. In addition, it also saves any additional costs for escorting family members.

The cost of the solution is dependent on the dialysis machine used. In this case, the machines are the property of Iceland's national university hospital.

Patients with chronic kidney failure are entitled to receive treatment at their local hospital. Between two and four patients have a four-hour treatment session three times each week. Individual guest dialysis treatments are also carried out. The age group is 40 to 75 years old.



Beneficial effects

- Patients do not have to travel three or more times a week to receive treatment
- Reduced anxiety and increased security for the patient
- More stable treatment
- Lower cost
- Lower morbidity



Prerequisites for a successful implementation

Nurses must receive two weeks of training in Reykjavik before they can start treating patients. The health professionals (doctors and nurses) design a training programme and follow it up. A connected electronic health record system is an important component.

Skype is not the ideal solution for meetings of this type at which health issues are discussed. A secure solution is therefore required.



Follow-up and evaluation

An annual visit from a kidney specialist.

Users' comments

"Having access to this service, here in my hometown, has changed everything for me. I would have been forced to move to Reykjavik if I hadn't had this service. I used to fly to Reykjavik three times a week in the beginning, and this made me very tired. I wasn't as ill then as I am now, so this changes everything."

Man, 37 years old



Conclusion

Can be used in other hospitals in sparsely populated areas.

Finland

Cancer patients enjoy improved quality of life using a **mobile device or a computer**

Cancer patients have many questions and sometimes need to be able to contact health professionals when they are wondering about something. In addition, the staff often want to know how the patient is feeling. In Finland, a digital service is used to monitor cancer patients' symptoms, well-being and quality of life. This helps healthcare teams to predict complications and relapses at an earlier stage than before.

The digital service has various features. Patients can talk about their symptoms and receive instructions about how to take care of themselves. The patients can use the service via a mobile phone, computer or tablet, no matter where they are. Health professionals check communications from the digital service twice a day and respond within one to two days. The service is not intended for emergency cases.

The service is used at seven university hospitals and three district hospitals in Finland. In Tampere, for example, 1,200 patients are using the service.

The service will be changing into a proactive treatment method, creating the potential for increased life expectancy, reduced time spent in hospital and fewer visits to the casualty department. The service can also be used for pharmaceutical research. Within traditional research, data collection is a slow and expensive process. By using this solution, the cost of data collection is halved. Patients are also more willing to participate. Thanks to the solution, the results can be reported in real time.

A digital service can help to prioritise and replace hospital visits. Health-care resources can be switched from physical contacts to a digital service, which means more patients can be treated. This does not entail any costs for the patients.



Beneficial effects

- Improved quality of life and increased self-examinations. For the patients, the service means quality of life and a sense of security.
- The solution improves care and means that it is provided more smoothly. Staff can plan their time better. There are also fewer phone calls during the working day. Patients visiting the clinic can receive treatment without interruption.
- The clinics can monitor their patients in real time and recognise severe symptoms. Clinics can determine which patients have to go to hospital and which ones can stay at home after having received instructions. The patients are not left alone. They also have a link to health professionals in between hospital visits.



Prerequisites for a successful implementation

The digital service's only requirement is that the patient can operate a mobile phone or computer. The implementation process is relatively easy. The hospital must use the solution (through an agreement with the company) and notify cancer patients that this type of service is available. The solution does not need to be implemented in any patient record system.



Conclusion

The service can be used in all health districts. It can also be used in other countries.





Distance monitoring

Sweden

Smartphone app monitors the health of chronically ill patients

The average age of the population is rising, partly resulting in an increased demand for care. The increased care requirement is placing a higher burden on healthcare providers. Finding smart working methods may be the solution to challenges of this kind. One method involves monitoring patients with chronic illnesses. District nurses can take care of their patients using a system that makes it possible for the patients to conduct medical tests themselves, in their own homes.

Region Jämtland Härjedalen in northern Sweden aims to offer high-quality care using existing resources, despite geographical conditions that entail long distances between care units and patients. The region has a large number of health centres that are costly to operate. Monitoring is a working method that constitutes the solution to some of the region's challenges.

Patients who have a smartphone can install an app that communicates with a health tracker, blood pressure monitor and scales. Blood sugar levels can be registered manually using the app. All readings are sent to a cloud service, where they are monitored and evaluated using artificial intelligence (AI). All the readings are monitored by the system, and a nurse will contact the patient if anything appears to be wrong or outside of the established limits. The nurses can communicate directly with patients, using text chat or video communication. Doctors are only consulted by nurses when necessary.

Assessment forms in the app can be used to make assessments of mental illness.

Those who use the system involving monitoring with the aid of an app on their phone include patients with chronic illnesses who require regular medical tests, patients at risk of chronic illnesses with a view to preventive measures such as weight loss, and patients who are on medication.

The solution costs approximately SEK 200 per patient per month – including equipment. Monitoring via an app on your phone means e.g. fewer days of care and fewer ambulance journeys. Region Jämtland Härjedalen considers there is great potential for expansion. Around 25 new patients are being added each week.



Benefits for the patient

- The patient feels free and does not have to wait by the phone to book an appointment or take time off work to visit a health centre.
- White coat syndrome (a phenomenon resulting from the anxiety that can be experienced when visiting a clinic) is not a factor when the patient conducts the monitoring at home. It is also easier to fine-tune medication.
- Prevention of stroke and cardiovascular disease.
- Screening for mental illnesses.



Benefits for the operation

- Nurses can handle more patients.
- Patients who can and want to manage their own care have the opportunity to do so. The nurses can focus on patients who have greater needs.
- Better working environment.



Benefits for society

- Fewer journeys – good for the environment.
- Lower costs for health care.



Prerequisites for a successful implementation

It is important to start by identifying individuals who are enthusiastic about this type of solution. This applies to both patients and staff. Patients must have a tablet or smartphone, or a later version of an iPod, and may need help configuring and managing both the app and any medical equipment.

Procedures have been developed during the project. These procedures involve testing everything at an early stage and interrupting the process if it is not working. Weekly meetings are held with project managers, IT, the service provider and people involved in monitoring in order to identify problems at an early stage.

New workflows have been developed for the nurses who monitor the patients. The health professionals have been able to participate in and influence the work.



Follow-up and evaluation

It is easy to view statistics, and everything is followed up on both a weekly and a monthly basis. Questionnaires can be sent via the system and health centres have their own Facebook pages containing information about how to participate and how to register.

Users' comments

"We check blood pressure around 50 times a day. We wouldn't be able to carry out that many checks at the clinic. You could say that I meet around 50 people, but that it happens in the digital world."

District nurse

"I can control my life in a new way. I'm part of my own care."

Patient



Conclusion

The solution can be used both in rural areas and more urban areas, and can also be scaled up to cover the whole region. The solution has started being used for COPD and fatigue syndrome, as well as for preventive activities with regard to weight, exercise and anti-smoking campaigns. A collaboration has also been initiated with specialist care in respect of heart failure.

Sweden

Digital night monitoring with cameras offers undisturbed sleep

Physical visits in the form of night patrols can be extremely disruptive for elderly people who require supervision. Kramfors Municipality in Sweden uses digital night monitoring to enable users to enjoy an undisturbed night's sleep, while being just as safe as if they had been monitored by a person physically checking up on them. The whole purpose of using cameras is to match the unique needs of each user.

Users in Kramfors can choose between physical visits and digital monitoring at night. The number of checks performed is the same. It is easy to satisfy individual needs if the checks can be performed using a camera, as there will be no need to schedule visits to match a driving schedule.

A camera and a mobile router are installed in the user's home, and the camera is pointed towards the bed. An assistant nurse at a central unit in the municipality conducts digital checks at specific times during the night, as agreed with the user. The unit makes 30 digital checks per night.

This makes up 26% of ongoing night monitoring in Kramfors. The physical visits that also take place are necessary because other tasks have to be performed, such as providing assistance going to the toilet, changing incontinence aids and so on.

The time required to conduct digital checks, less than half an hour for all 30, must be compared to the fact that it can take 50 minutes, one-way, to drive to users living in remote parts of the municipality.



Around 46% of all Swedish municipalities offer some form of digital night monitoring. Nurses carry out the checks and notify the night patrol if they need to make a physical visit.

Digital night monitoring is free of charge for the user. Physical visits are charged according to a standardised hourly rate. The equipment is rented out by the service provider and costs SEK 450 per month, per user. In Kramfors, this is paid for by the municipality.



Benefits for the user

- The user is monitored without having their sleep interrupted at night.
- Users with cognitive impairments or dementia may be anxious ahead of a physical visit. This does not happen with digital monitoring.
- Lower risk of injuries from falls.
- Medication may be reduced in certain cases.
- The checks are adapted according to individual needs.



Benefits for the operation

- Working model that will work in the future.
- Fewer time-consuming journeys.
- Fewer night drives on dark roads.
- Frees up time for patients who really need a physical visit.



Benefits for society

- Less driving is good for the environment. Digital checks can replace 173 kilometres of driving each night, which is equivalent to 63,080 kilometres annually (Kramfors).

Users' comments

"I feel safe with the camera. That thing up there (pointing at the camera) sees everything and I get help when I need it."

Woman aged 100+



Prerequisites for a successful implementation

It is important to be proactive in terms of communication regarding digital night monitoring, to ensure that people understand that this is not about surveillance. For this reason, potential users and the public should be notified at an early stage in the process. Doing this in the most optimal way, such as marketing through various channels, participating in meetings with elderly people or being proactive with the media, can be a challenge.

It can also be difficult to deal with negative articles and comments. It is a good idea to involve the local media early on in the process and to give examples of positive cases. Information meetings for staff working in elderly care are a good idea, so that they in turn can be good ambassadors.

Training for staff takes one hour and training for technicians takes three hours. Staff training is not particularly time consuming, with more time needing to be spent on information and marketing.



Follow-up and evaluation

Follow-ups are regulated by law and take place once or twice a year. Every service received by a user is evaluated.



Conclusion

Digital night monitoring can be used in all municipalities and is suitable for all users who do not require physical visits. Sparsely populated areas are particularly suitable as the distances can be large, although the solution can also be used in more urban areas.

Sweden
Norway

GPS and virtual fences are common location technologies

We are facing a double demographic challenge. The ageing population's need for health and care services is increasing, at the same time as access to labour is decreasing. Digitalisation is becoming increasingly important in allowing municipalities to offer high-quality health and care services. Various types of location technology for people with cognitive impairments or dementia are being tested in Norway.

Several municipalities in Norway have offered location technology as part of their rehabilitation activities. Users with learning disabilities enjoy both a high level of security and the freedom to spend time outdoors with the aid of virtual fences (geofences), which trigger a warning when the user enters or leaves a geographic area. Devices with two-way voice function can be useful, but not all users know how to use these devices. Finding techniques that are reliable and convenient is a challenge. GPS technology for tracking users is another solution that is used in many municipalities.

Various types of location technology have been tested by the Larvik, Skien, Oslo, Bergen, Stord, Bjugn, Bærum, Drammen, Trondheim, Åfjord, Sarpsborg, Vestre Toten, Søndre Land, Lyngdal, Sirdal and Kvinesdal municipalities. Most of these municipalities have received funding for testing from the National Programme for Personal Connected Health and Care (NVP). The exception to this is Oslo municipality, which has introduced location technology for users in the field of dementia care as part of the Unity project. Several municipalities have been involved in the "Trygge spor" project, led by SINTEF, which has conducted an impact study based on experiences from 19 municipalities, as well as developing a service model regarding how municipalities can use GPS for people with dementia. At present, 80% of the municipalities in Norway are involved in activities that are supported by the National Programme for Personal Connected Health and Care.

Several of the municipalities that took part in the development phase for NVP have tested GPS solutions for tracking people. GPS tracking solutions make it possible, if necessary, to locate the wearer or carrier of the GPS device. NVP has recommended that this service should be implemented nationally.

The municipalities estimate that location technology services will delay the need for some users to move into an institution.

Drammen has drawn up an estimate based on eleven residents with cognitive impairments who had prompted search efforts before being supplied with location technology. They would normally have had to move into a care home. Bearing in mind how long they have continued living at home thanks to location technology, the municipality has produced estimates of savings per person, based on the price for a place in a nursing home (SEK 3,196/24-hour period) and spread over the relevant years. In 2014, the municipality expects to have saved NOK 2,109,360, i.e. NOK 124,000 per user. The anticipated number of users in 2016 is 28, giving a potential total saving of NOK 3,474,240 (Drammen Municipality, 2016).



Benefits for the user

- Increased sense of security, freedom and quality of life for users of the service and their relatives.
- In Drammen Municipality, 28 people have received the location service. They have been given a safe, more active day-to-day life as well as improved social and mental stimulation.
- For almost 70% of the users in Larvik Municipality, GPS means that relatives or staff do not have to divert or prevent a person diagnosed with dementia or cognitive impairments from going out.
- The use of location technology is the least intrusive measure for some users.
- The majority, if not all, of the municipalities that have tested location technology have noted that the service recipients can remain at home for longer or delay the need to start using other services.
- The service also prevents the need for major search and rescue operations. The user can be located quickly via GPS.



Prerequisites for a successful implementation

The Norwegian Directorate of Health, along with the Norwegian Municipal Association (KS) and the Norwegian eHealth Authority, runs the NVP programme. The aim of the programme is to ensure that personalised healthcare becomes an integral part of health and social care services in

2020. Between 2013 and 2016, a total of 31 municipalities were included in the programme as developers. At present, during the escalation phase, 80% of the municipalities are participating in the programme. NVP provides a wide range of implementation tools and support for the municipalities:

- National recommendations
- Guidelines for service innovation and management of benefits
- Guidelines for implementation: Roadmap and quick guide
- Courses in the "ABC of welfare technology"
- Process support
- Conferences, workshops and seminars

Standardisation is a vital task in order for personal health and social care to be implemented in Norway in line with internationally approved standards to the required extent.

Good systems for response management, procurement, integration of patient record systems, changes in mindset and, above all, solutions that meet users' needs are an important prerequisite.



Follow-up and evaluation

During 2016, in order to expand the solutions that are already in operation, the development municipalities have worked systematically to acquire technical solutions, organise the management of alarms and establish good procedures for training, follow up and adaptation of technical solutions.

The municipalities have also worked systematically on profit planning, and have identified good measurement indicators for welfare technology, evaluation and documentation.

From 2017, the NVP programme moved into a dissemination and escalation phase. The transition to the operating phase can be critical. For some municipalities, the transition will be more extensive than for other municipalities because they have selected different ways of implementing the new services. Regardless of the method chosen by municipalities, it is important for the transition to regular activities to be taken into account at an early stage in the process.



Conclusion

The NVP programme in Norway highlights the realisation of the effects, depending on the context and the service in the individual municipality. For successful implementation of welfare technology, the municipality must succeed in changing the way the services are delivered. Welfare techno-



logy must also be viewed in conjunction with other user-oriented services, such as daily exercise and rehabilitation. The municipalities that adapt the technology to their existing services have the greatest potential to enjoy considerable benefits from welfare technology.

Users' comments

"A day without an excursion is a bad day."

User, Larvik Municipality

Use of mobile safety alarms with GPS in Sweden

Around 60% of all municipalities in Sweden use some kind of GPS alarm or GPS watches, and Östersund Municipality is a good example. The municipality has many years' experience of using this type of technology and currently has some 350 GPS watches in operation. The number of watches increases every week.

At first, the watches were mostly used for people who had been diagnosed with cognitive impairments or some form of dementia. They are now used by anyone who wants to be more mobile, but still needs to feel safe.

Their functionality can be tailored to each individual user. The alarm can be activated manually if the user needs help, although geofences can also be used if a particular user goes too far. Falling sensors can register if the user has fallen over and cannot get up, which also triggers an alarm. The watches can also be configured so that the alarm is sent to a partner or relative, rather than going directly to the call centre.

GPS watches can provide users with a sense of freedom that cannot be offered with a normal safety alarm that only works in the user's home. A GPS watch can provide the same sense of security and works everywhere. Users can get their social life back without having to be confined to their own home.

The municipality has 1,650 normal safety alarms, and it is estimated that more than half of these could be replaced by GPS watches in the future. However, users who do not need to be mobile and who only use an alarm in their home should continue to use the normal safety alarm, as this does not need to be charged.

In addition to the obvious positive effects for users, limited municipal resources can be used where they are needed most. GPS watches can be combined with other types of sensors, including door alarms and security cameras.

Denmark

Pregnant women experiencing complications can **take their own measurements at home**

Women with pregnancy complications often need to go to hospital for checks. These visits can be time consuming, both for the patient and for the health professionals. A telemedical solution involving home monitoring allows women to take measurements themselves at home instead.

In Denmark, home monitoring is offered to pregnant women with preeclampsia, premature breaking of the waters, or other complications or medical conditions. The solution replaces a large number of hospitalisations and hospital visits, benefitting both pregnant women and hospital staff. The solution makes it possible for women themselves to take measurements at home, allowing hospital staff instead to focus on patients who need physical appointments. The Telemedicine for Pregnant Women with Complications service is available in a number of locations in Denmark, including in the Copenhagen region and in parts of Jutland.

The women take their measurements at home before nine o'clock in the morning, and the midwife or the nurse at the hospital goes through the readings. If they notice any abnormalities, they discuss this with the obstetrician.

The workflows in the hospital department have been revised so that telemedicine services replace hospital visits, rather than telemedicine services being viewed as a complement to visits. Nurses and midwives have received training both in the use of the telemedical equipment and to enable them to communicate their knowledge to the pregnant women.

Telemedical home monitoring can be used by pregnant women who are experiencing complications:

- With complicated hypertension.
- With preeclampsia and chronic hypertension.
- With mild to moderate preeclampsia.
- With premature breaking of the waters before the 37th week of pregnancy, without regular contractions.
- With previously severe preeclampsia.

Many of these women would normally be hospitalised. In Denmark, there are an estimated 2,600 women who have one of these five types of complications.

The telemedical equipment consists of:

- A tablet.
- A blood pressure monitor.
- Test strips for measuring protein in urine.
- CTG device for measuring contractions and foetal heart sound.
- Scales.
- CPR meter for measuring infection parameters, applies to women with premature breaking of the waters before week 37.

Costs arise for healthcare professionals who are coordinating and checking the telemedical treatment being carried out. Training pregnant women with complications how to use telemedical equipment also entails a cost, as does operating and maintaining telemedical treatment.

The investment costs amount to approximately 25% of all costs over a five-year period. Calculations according to the Danish Agency for Digitisation's report Business case for nationwide expansion of telemedical home monitoring of pregnant women with complications show that there is a net savings potential of DKK 18 million over five years.



Beneficial effects

It is possible to avoid many hospitalisations for women who have experienced premature breaking of the waters before week 37 of the pregnancy, since the women themselves will be able to monitor their pregnancy. Some of the visits to the maternity centre can be replaced with telemedicine. When it comes to complications of this type, the report from the Agency for Digitisation estimates that the potential exists to reduce hospitalisations by 5,850 days across the whole of Denmark.

Telemedical home monitoring for women with premature breaking of the waters before week 37 makes it possible to reduce the time of admission in hospital by an average of 22 days.

For other sub-target groups, telemedical home monitoring entails a cost saving of 45% per outpatient examination.

Pregnant women with complications are satisfied with the telemedical solution, as it contributes to higher levels of safety and flexibility during the process.

Users' comments

"This is my first child, so I was absolutely devastated when things went wrong in week 28. I really believe that being able to stay at home made a difference for me. My water broke prematurely, and I would normally have had to be hospitalised or to visit the hospital daily for measurements to be taken. I have been able to take the measurements at home in the morning, finish everything within an hour and then get on with the things I needed to do. I've always had a lifeline to the hospital, so I've felt safe taking the measurements at home. I don't know if this is because Lone (the midwife) explained so much to me in the beginning, including how to take measurements, and because I've had a direct number to the hospital. I've never felt anxious about taking the measurements at home."

Patient



Prerequisites for a successful implementation

Users will need to be trained in how to take basic measurements.



Conclusion

This solution can be used for all pregnant women who have at least one of the above five complications. It reduces the number of hospital visits as well as the number of hospitalisations. The solution can be used everywhere, as long as the pregnant women have access to the necessary equipment through the hospital.

Sweden
Norway

Medication dispensing robots provide increased quality of life

Umeå Municipality is one of several Swedish municipalities that use medication dispensing robots to allow users to become more independent with their medication. In the autumn of 2018, the municipality deployed 35 dispensing robots in ordinary homes. The robots ensure that users receive the right medication in the right dose and at the right time.

The user is notified by audio and light signals, as well as by information on the robot's display, when it is time for them to take their medication. If the user does not take their medication at the right time, it is transferred to a locked container and the staff are sent an alarm. The robot is suitable for people who need to be reminded to take their medication. It is also important that the users have a positive attitude towards their medication, and are motivated to become independent.

Even though the medication dispensing robot was only introduced in Umeå municipality relatively recently, the municipality has noted considerable benefits from the technology and the working methods. In addition to the fact that users can take responsibility for their own medication, other positive effects include increased compliance with the medication and fewer work journeys for the staff. The robot also helps to reduce the problems regarding skills provision in many Swedish municipalities, as home care activities can be streamlined.

Umeå municipality plans to have around a hundred robots deployed by the end of 2019, and then to increase this number by an additional 75 robots per year. Around a third of all users receiving home care are expected to gain an effective tool to help them take their medication in this way. In the long term, the number of users is expected to reach 300.

Umeå municipality has focused to a large extent on staff training and providing information to users, as well as placing great emphasis on collaboration between the municipality and the region in respect of the process and the assessment. Users who have access to a dispensing robot are generally very satisfied.

Medication can be managed at home using electronic control

The ageing population's need for health and care services is increasing, at the same time as access to labour is decreasing. Digital medication control is an important service in Norwegian municipalities in this context, enabling them to offer high-quality health and social care services.

Trials with digital medication control in Norwegian municipalities have covered both electronic multi-dose dispensers and electronic carousel solutions, where staff place the medication manually in a tray comprising various compartments. The trial is part of the National Programme for Personal Connected Health and Care (NVP). The project is run by the Norwegian Directorate of Health, the Norwegian Municipal Association (KS) and the Norwegian eHealth Authority.

A number of municipalities have trialled both types of medication support, with several of them opting to focus on multi-dose dispensers when expanding their service. Using multi-dose dispensers, the staff do not have to spend time placing the medication in compartments, as is the case with carousel solutions.

Digital medication control means that electronic dispensing robots indicate when the user should take their medication. The robots register whether the user has removed the medication from the robot. It notifies the care provider if the medication has not been removed, i.e. that the user has not taken their medication. In Stord Municipality, this service has been shown to reduce overmedication within a mental health unit. This is because the users have dispensing robots that dispense the right dose at the right time, and that are otherwise locked.

Several solutions comprising electronic multi-dose dispensers and electronic carousel solutions have been trialled in other municipalities, such

as Bergen, Bærum, Larvik, Lindås, Lister, Oslo, Sarpsborg, Søndre Land, Tromsø, Værnes and Vestre Toten.

The main target group for this service has been elderly people living at home. Stord and Tromsø municipalities have also offered the service to people with drug abuse issues and people with psychiatric problems. It is only possible to reduce the number of home care visits when the users feel secure with the technology. It takes about two weeks to train the user. The greatest benefit can be achieved for users who do not use any other services and for whom daily home care visits can stop and be replaced by visits for automatic refilling of the medication every other week.

During the service's development phase, 31 municipalities were appointed as developers. Today, 80% of the municipalities in Norway are involved in activities that are supported by the National Programme for Personal Connected Health and Care (NVP).

The National Programme has recommended that this service should be implemented throughout Norway. The recommendation is based on the benefits that emerged during the period when the digital medication control service was being developed.



Benefits for the patient

Users who learn to use electronic medication have noted a number of positive effects:

- Increased sense of control.
- Increased level of activity and additional content in everyday life.
- Increased sense of dignity.
- The right medication at the right time.

Even though some users miss their home visits, many are happy to have fewer people visiting their home every week.



Impact on the operation

For those Norwegian municipalities that participated in the development work, the effects of the trials have been summarised in an implementation report with recommendations.

- Electronic medication saves time for municipalities as a result of fewer home visits and/or less time per home visit. Bærum Municipality estimates that the handling of medication saved the equivalent of 2.3 full-time positions in 2016. The time saved has increased capacity, as municipality was able to offer services to more people with the same resources.

- Medication management within home-based services has been improved. The mental health unit in Stord Municipality has been able to reduce the number of inspections carried out at several of its users, from daily contact to contact once a week or every other week.



Prerequisites for a successful implementation

The overall objective of the National Programme for Personal Connected Health and Care is to ensure that personalised health care in Norway becomes an integral part of the health and social care services by 2020.

- Domestic standardisation is essential in order for personal health solutions to be able to be implemented according to the internationally approved standards that exist.
- Good systems for response management, procurement and integration of patient record systems.
- Changes to the approach and, above all, regarding solutions that meet users' needs.

NVP provides a range of implementation tools and support for the municipalities that are participating in the programme. The tools and the support they receive are:

- National recommendations.
- Guidelines for service innovation and management of benefits.
- Guidelines for implementation: Roadmap and quick guide.
- Courses in the ABC of welfare technology.
- Process support.
- Conferences, workshops and seminars.



Follow-up and evaluation

During 2016, in order to expand the solutions that are already in operation, the development municipalities have worked to acquire technical solutions, organise the management of alarms and establish good procedures for training, follow up and adaptation of technical solutions.

The municipalities have also worked on profit planning, and have identified good measurement indicators for welfare technology, evaluation and documentation.

From 2017, the NVP programme moved into a dissemination and escalation phase. The transition to the operating phase can be critical. For some municipalities, the transition will be more extensive than for other



municipalities because they have selected different ways of implementing the new services. Some municipalities have adapted and further developed the service as more service recipients have been added. Others have chosen to adapt and prepare the service for a large number of users before the technology is implemented. Both methods mean that it is important to take into account the transition to regular activities early in the process.

Users' comments

"The quality is improving as there are fewer deviations when the users take their medication."

Employee, Larvik Municipality



Conclusion

The NVP programme highlights the realisation of the effects, depending on the context and the service in the individual municipality. Different municipalities have different opportunities to make savings, and the benefit in one municipality cannot be transferred to another municipality with the same technology. This is due to the way healthcare and social care services are organised, as well as due to resources and demographics. Each municipality must identify its own potential to deliver better, more efficient services.

Norway

Sensor technology about to be introduced throughout Norway

Digital supervision is also known as sensor technology or passive alerts. The technology may consist of various sensors that issue an alarm if a person falls over or is not where they are supposed to be at the time. There are many variants and the technology is constantly evolving. In Norway, there are recommendations for the technology to be implemented nationally.

Digital supervision could take the form of a sensor plate that detects when a person is not lying in bed. Alternatively, it could comprise motion sensors in particular rooms, door alarms that issue an alert when someone passes through, or fall detectors that register sudden movements. Services that use sensor technology are often included in security packages, where alerts, alarms and signals are sent to a call centre. Sensor technology can be combined with a camera for image transfer. The person who receives the alarm can then log in at the agreed time or activate image transfer when an alarm is triggered, and then take the necessary action.

Suitable users for sensor technology include elderly people who live at home and who receive municipal home and care services. During the development phase for this service, 34 municipalities were appointed as developers. Today, 80% of Norway's municipalities are involved in activities that are supported by the National Programme for Personal Connected Health and Care (NVP).



Benefits for the user

For those municipalities that participated in the development work, the effects of the trials have been summarised in an implementation report with recommendations.

- Reduced physical monitoring means that both users and relatives avoid having to be woken up by health professionals checking how they are doing.
- In home-based services, alerts from sensors mean that staff can get there in time to prevent people wandering around at night or falling.
- Experience shows that the technology helps users to stay at home for longer, with a limited service level. Some municipalities report that users who have the technology installed in their home can be sent home earlier after hospital stays.



Benefits for the operation

- More targeted visits from home care. Digital supervision makes it possible to reduce the allocated service period. The services are geared towards users who receive visits when they issue an alarm and need help – whereas they were previously visited as part of permanent supervision.
- Digital supervision can lead to a reduction in the growth of health and social care services thanks to the efficient use of resources.
- Digital camera surveillance means that the number of visits due to false alarms is reduced because staff can log in and “see” what is going on. This means that the municipality can make considerable savings, at the same time as increasing the safety of both users and its staff.
- Several municipalities that have trialled digital supervision in the field of habilitation consider that it leads to reduced use of measures aimed at preventing injuries in emergencies.
- Several municipalities have seen positive benefits from digital supervision, as well as highlighting reduced recruitment and a decrease in the number of night-time employees in care homes for the mentally ill that are staffed around the clock.
- Grimstad Municipality has estimated that a night guard is equivalent to 1.8 man-years and a saving of NOK 1,370,000 per year. Selbus Municipality has been able to reduce its one-to-one staffing per day for a user who has been supplied with a door alarm.



Prerequisites for a successful implementation

Since 2013, digital supervision or various individual sensors have been tested in several Norwegian regions. From the early trial period through to the present day, it appears that municipalities have increasingly benefited from the service. This seems to be particularly relevant for people with cognitive

impairments in order to prevent them from "wandering" at night, both within institutional care and home-based services, as well as reducing the need for staffing within habilitation.

- Domestic standardisation is essential in order for personal health solutions to be able to be implemented according to the internationally approved standards that exist.
- Good systems for response management, procurement and integration of patient record systems.
- Changes to the approach and, above all, regarding solutions that meet users' needs.



Follow-up and evaluation

During 2016, in order to expand the solutions that are already in operation, the development municipalities have worked to acquire technical solutions, organise the management of alarms and establish good procedures for training, follow up and adaptation of technical solutions.

The municipalities have also worked on profit planning, and have identified good measurement indicators for welfare technology, evaluation and documentation.

Users' comments

"The most important gains we see are a reduced need for and fewer home care visits, a reduced need for placement in institutional care, increased security, freedom, a sense of power and independence for users and relatives, a reduced burden on the service and fewer compulsory measures."

Service operative, Larvik Municipality

Digital security system in order for people to be able to stay at home

Finland's national goal is for elderly people to be able to remain safely in their own home for as long as possible. Technology and a supportive service model can help provide a sense of security. A safety service used by several Finnish municipalities allows people to issue alarms themselves if necessary. There are also a large number of smart solutions that can issue alarms automatically.

Many municipalities in Finland offer safety services to allow users to live at home. The technology plays a central role, and it is important to have a range of different solutions in order to promote security. Many municipalities have created a model where an alarm is sent directly to health professionals at the municipalities own call centre, which is staffed 24 hours a day. The service centre receives calls and other information from users. Health professionals are also available 24 hours a day to help users.

There are a range of technical solutions that serve the needs of various users:

- Security phone with a wristband. If a person falls over, they can call for help.
- Smart door alarms for elderly people with dementia and cognitive impairment. The alarm issues an alert when a door is opened and someone leaves the residence, but does not issue an alert simply because the door has been opened.
- Different types of sensors in order to understand daily routines. For example, if the user visits the bathroom and stays there for more than an hour, the alarm is triggered, as it is not considered to be a normal routine.

- GPS tracking device with safety zone. If the user moves outside of a safety zone that has been defined on a map, an alarm is triggered.
- Motion detection based on an infrared camera.
- Room temperature, CO2 level.

All alarms must be integrated into some form of system or, if such integration is not possible, in a control panel. When a safety service is run by the municipality itself, it is easy to try out new, innovative solutions in order to find the best methods.

Safety services help elderly people to stay at home for longer, offering potential cost savings compared to care in an institution. Costs to bear in mind:

- The cost of technical devices ranges from a few euros to ten euros per user, including SIM card.
- A call centre system can cost several thousand euros.
- A 24-hour in-house call centre, with staff to receive alarms and staff to help people in their homes, require resources.



Benefits for the user

- This solution affects quality of life. The main thing is to create a sense of security for elderly people. Elderly people know that they can call for help without any problem in the event of an emergency or if they are anxious. There are also solutions for elderly people that request assistance automatically if necessary. Such solutions also create a sense of security among relatives and care providers.
- These solutions generate security, but of course also serve as genuine aids if there is actually a need for help.
- When a 24-hour call centre is run by a municipality, users and staff get to know each other.



Prerequisites for a successful implementation

In many municipalities, safety services have been outsourced. If a municipality wants to use this model, where all services are provided by the municipality as well, knowledge of procurement is required in order to understand all the necessary technology as well as how alarms can be integrated in a system.

Public procurement to purchase technology. Political decision-making (public or private sector).

Technical solutions must be easy to use and ideally not require any action on the part of the user. GSM is the most secure way of transferring data. It is also good to have a multi SIM card or a SIM card that supports roaming, as this is a critical service that has to work 24 hours a day, seven days a week.

Call centre systems are technically complex systems, and it is important to compare them and understand them.

Agreements with technology suppliers should not be binding for too long a period: new technologies and new solutions are coming onto the market all the time.



Conclusion

Safety services are probably the oldest form of technical service to support people living in their home. New solutions are constantly being released onto the market that can easily be integrated into systems. This model can be used internationally.







Distance meeting

Sweden

People living in sparsely populated areas meet their doctor via **smart video technology**

Residents of sparsely populated areas in Norrbotten County have the opportunity to meet a doctor in a health room, adjacent to the health centre. A nurse examines the state of the patient's health and takes any samples. The nurse has the opportunity to contact the hospital's on-call doctor and, if necessary, the doctor can talk to the patient face-to-face via a video system. The doctor can also use a remote-controlled camera to zoom in for closer examination, for example.

Region Norrbotten has introduced opportunities for video consultation between the health centres in the county's sparsely populated municipalities and the nearest hospitals. This initially related to operations between the health centres in Övertorneå and Överkalix as well as the emergency department at Kalix Hospital, but the system is now being introduced at an increasing number of health centres.

A video link can be used during on-call periods when the health centre's own doctors are not on duty. If a person needs to get in contact with health care but not visit a emergency department in person, they are referred to the health centre by 1177, a nationwide healthcare service. If the visit results in a video consultation with a doctor at the hospital, the doctor can assess remotely whether further examinations or tests need to be carried out locally or at the hospital, as well as prescribe treatment for the patient. If necessary, the doctor can also admit the patient at the health centre for observation.

This solution is based on standardised video communication technology that has been used routinely in the Norrbotten region for 15–20 years.

Care at distance is part of Region Norrbotten's strategy, and is used as a tool to move care closer to the patient. From the hospital to the health centre and from the hospital/health centre to self-care. The health centres in Övertorneå and Överkalix were the first to use this solution, and video links can now be used from several of Norrbotten's health centres to contact doctors during the on-call period. People who contact the Health-care Guide on 1177 are prioritised on the basis of their symptoms and how acute the situation is. The cases that are deemed most urgent – priority level 1 – are transported directly to hospital, while other less acute cases are handled at the health centre.

The services are used by citizens who need care outside of normal working hours, such as elderly people with multi morbidity or patients with infections, as well as nurses at health centres and on-call doctors at the hospital.

The health centres share the cost of on-call doctors from the hospital on the basis of the number of registered patients. The costs for on-call doctors have decreased from around SEK 3,500,000 to SEK 800,000. Treating patients with the right level of care entails a cost saving.



Benefits for the patient

- Opportunities for patients to bring health care closer to their homes to a great extent.
- Reduced travel in a county characterised by large distances.
- The opportunity to receive care from the staff you are used to meeting in your home town, as well as better access to medical consultation at night and at the weekend.
- The patients feel a greater sense of security, while the working model reduces the number of acute cases treated in hospital.



Benefits for the operation

- The increased level of coordination leads to a more efficient use of available resources for healthcare providers.
- Effective use of existing resources and improved conditions for being able to care for patients directly on site.
- Increased opportunities to move towards the right care in the right place. When assessing patients, nurses at the health centres are able to receive support 24/7 from on-call doctors in hospital emergency departments.



Benefits for society

- Reduced need for travel has a positive impact on the environment.
- Helps to reduce the social costs for patients who are forced to take time off work or who have to take sick leave in order to travel for examinations and medical consultations at a different location, as well as greater opportunities to maintain important social services in sparsely populated municipalities.
- The health centres in Övertorneå and Pello in Finland have shared an on-call service for 37 years, with the health centres being responsible for supplying on-call doctors every other weekend. Telephone and fax have been the primary means of communication. The new solution that is being established with Kalix Hospital provides added value in the form of video communication, which gives a complete picture of the situation from both the health centre's and the hospital's perspective, for example when it comes to the number of available beds.



Prerequisites for a successful implementation

It is important for the technology to be easy to use, so that staff can focus fully on the patient.

The joint participation in primary care and the hospital's on-call service is a success factor, as it gives a more complete picture of the patient's care.

Previous experience of collaboration with on-call services means that there is a level of maturity among doctors and nurses, which has simplified the implementation process. There is also complete confidence between the healthcare units and the various professional roles. This is a prerequisite in order for this type of working model to be successful. There were no national tools or strategies to use during implementation, but the concept fits well in the strategies as part of the ongoing primary care reform "Good quality, local health care", as well as the strategies described in "Local care" from the Swedish Association of Local Authorities and Regions. The working model is established within the responsible care units.

The development of primary care in sparsely populated areas is a politically prioritised area in the region. The decision to implement this service was part of proposed actions submitted by the region with the aim of creating a balanced economy.

Locally, considerable emphasis has been focused on involving the population in the development work. This has taken place through meetings and dialogues.



Follow-up and evaluation

This working model has been common practice for three years, with specific evaluations no longer being carried out. Data regarding how the volumes have changed in terms of emergency visits to Kalix Hospital and to the health centres in Övertorneå and Överkalix can be accessed from the health and production systems.

Between 2016 and 2018, the number of emergency visits to Kalix Hospital among patients registered at Övertorneå health centre dropped from 292 to 224, a decrease of 23 percent.

The collaboration regarding on-call services has resulted in a significant reduction in compensatory leave for doctors at the health centres. This in turn means that the availability of doctors during the daytime has increased. Even though the number of physical visits to the hospital has decreased, the number of visits to the health centres after normal working hours has been roughly the same.

Users' comments

"Using technology, we are shrinking the geographical distances and facilitating equal care for Norrbotten's residents. This really is the health care of the future!!"

Agneta Granström, city council administrator

"We are now used to using technology for communication. Distance care has been well received, including by our elderly patients. They feel that having assessments at home and not to have to travel is a good development."

Elisabeth Eero, Head of Operations at Övertorneå Health Centre



Conclusion

Collaboration with distance on-call services could be established at all staffed health centres – throughout Norrbotten, across the whole of Sweden and the entire Nordic region. Urban culture is different from rural culture, which can make it more difficult to establish the working models in an urban environment. People are used to having the skills they need locally. Below is a description of a similar solution for a distance on-call service in a rural part of Västerbotten County.

Distance on-call service in a rural part of Västerbotten

A working model with distance on-call support after normal working hours has been used for almost ten years at the cottage hospitals in Storuman, Tärnaby, Sorsele and Malå in Västerbotten. The solution comprises a video conference system with a high-resolution, ceiling-mounted camera in the emergency departments.

The doctor who is responsible for the on-call service can contact the emergency department by means of a video link. The doctor will either be at home or elsewhere in one of the towns or cities. The video connection is established via a computer, tablet or smartphone. The cottage hospitals have experienced nurses who are available around the clock.

As one doctor can handle the on-call service for a large geographical area, the working model can be streamlined while maintaining the quality of care for the patients.

The working model will be extended to a further three cottage hospitals in the southern Lapland healthcare district.

Greenland

Pipaluk – a telemedical solution that helps Greenland's residents

The populations of 60 settlements in Greenland have a telemedical workstation known as a Pipaluk (Greenlandic girl's name meaning the cautious one). It is based on searchability, as well as satellite and Internet technology. The equipment is not particularly large and includes a webcam, Skype, ECG equipment, instruments for measuring blood pressure, heart rate and temperature, as well as a stethoscope.

Visiting your own doctor, contacting a doctor or a emergency department and being treated within a short space of time are not common occurrences for the population of Greenland. The nearest hospital could be several hundred kilometres away. If a Greenlander is in a kayak, on a dog sled or on foot in the wild, it is very difficult to access the Internet. As a result, Greenlanders are living dangerously when they become seriously ill or are involved in an accident.

The aim of Pipaluk is to create equal access to health care. Each nursing station has health professionals who are solely responsible for receiving patients and taking measurements, as well as for communicating with various specialists from Queen Ingrid's Hospital in Nuuk or one of the Danish hospitals they collaborate with.

There are costs associated with the procurement and installation of technical equipment, as well as costs in association with the training of health professionals.



Beneficial effects

- The people who live in sparsely populated regions far from health-care units are able to get help closer to home thanks to Pipaluk. As a result, these people do not have to travel far to get care.

- People don't have to wait long before being able to consult health professionals.
- The solution reduces travel costs both within Greenland and between Greenland and Denmark.
- Residents can now be examined and receive an assessment of whether it is necessary for them to seek a specialist.



Prerequisites for a successful implementation

Special organisational planning is required to get the solution to work. Successful implementation and operation are dependent on dedicated and motivated employees who are supported by their management at all levels.

The technical solution must be functional and health professionals must be employed and trained in the rural areas.

Staff in hospitals have to get used to not seeing all their patients in person, in addition to being able to diagnose remotely and to determine whether a hospital visit is required.

Users' comments

"Generally speaking, Greenlanders are positive towards the telemedicine service and consider that it provides the opportunity for easier access to diagnosis, treatment and follow-up when they live far from a hospital or health centre. However, there are challenges that can entail larger obstacles than purely geographical ones, namely the language barrier – both within Greenland itself and when communicating with Danish doctors."

Lise Hounsgaard, professor



Conclusion

The Greenland model for the use of telemedicine differs somewhat from other countries. The use of telemedicine focuses on the part of the process with the patient that in Denmark would take place at the actual hospital. In Greenland, telemedicine is used throughout the process, both for visits and diagnosis as well as for carrying out checks. The reason why telemedicine is used throughout the process is the geographical conditions. There are also skills-related reasons, because Greenlanders want to bring specialists closer to the citizens without using expensive transport.

Telemedicine is therefore used both internally within Greenland's health-care system and in relation to external partners who provide healthcare services to patients in Greenland.

Finland

App reduces unease within social care in Finland

An app that makes it possible to send messages securely between care providers, social workers and families is the solution within social care in the Finnish city of Oulu. Families can contact care providers and receive messages and pictures from their relatives in their day-to-day lives.

Several providers within both the public and private sectors offer social care for the elderly. Elderly people can receive many home visits each day, and the care providers can often vary. In some cases, the rest of the family do not feel they are being kept up-to-date and do not receive information about the care their relatives are receiving. It can be difficult to reach the care provider by phone.

At times, relatives are concerned about the elderly person's care and how his or her day-to-day life is going. A lack of information about the user's everyday life can give rise to increasing distrust and concern.

The app is a solution that helps reduce distrust and allows people to send secure messages to each other. The solution is mainly used within elderly care and for people with disabilities. Other potential user groups include staff working within social care as well as social service workers in the field of child and youth work.

The cost of the solution for organisations or users is less than 5 euros per month.



Beneficial effects

- The solution reduces telephone contact and increases confidence among users, families and care recipients. It is a safe and easy way to stay in touch.

- Dissatisfaction and distrust diminish when families receive the information they need about the everyday lives of their relatives, and time is freed up within the care system that can be devoted to users.
- The solution makes it possible to communicate with family members far away and involve them in the care and day-to-day lives of their relatives.
- The solution makes a positive difference to the culture and practices that are common within health care, where the families are not involved and don't know the extent to which the care reflects the everyday life of the user.



Prerequisites for a successful implementation

The solution is simple to implement. It does not require a national infrastructure and can be used via an app or browser.

The organisation decides to implement the solution and enters into an agreement regarding usage with the company. The company notifies the healthcare providers and relatives about how the solution is to be used. The organisation must appoint a person to coordinate establishment and assist in the implementation process.

An application or website that is easy to use: log in and start using the solution. A smartphone, tablet or computer is required. Basic technical skills are sufficient.

Users' comments

"It's been easy to start using this service. We haven't had any problems. It is convenient because you can add pictures from your day-to-day life."

Niina, care recipient, Oulu



Conclusion

The solution can be used within housing services and home care for people who live at home, and it can easily be expanded. The solution has no geographic boundaries. There are also other possible ways of using the solution, as well as additional target groups other than disabled individuals and elderly.

The basic use of the system comprises messages between people, but the solution can also be used to gather data about user satisfaction that can be used to improve the service.

Finland

Round-the-clock e-service for health and social care

Resources within health and social care may be limited in relation to the users' actual needs. Some aspects can be managed by citizens without any professional involvement. In Finland, society offers an e-service for health and social care. This service is available 24/7 and enables municipal residents to manage self-care within health and social care.

The e-service for health and social care was developed jointly as part of a national project in Finland during the period 2006–2009. The project partners came from both the public and private sectors. When the project was completed, the solution was introduced in several regions, and one of these regions, Oulu, continued to develop it. In December 2018, Oulu Self Care was introduced as one of the top ten methods in the EU when it comes to using digital solutions to support citizens' health.

The service allows citizens to manage their health data and check laboratory results, get hold of reliable information, conduct meetings with care and health specialists as well as consult them.

Users are all municipal citizens over the age of 18. Parents can also enter into agreements on behalf of their underage children. In 2017, the service had 104,000 registered users and 14,200 monthly users.

Self-care reduces the number of visits and phone calls to health professionals by allowing citizens to manage their own tasks. The costs depend on the content that is required.



Beneficial effects

- The solution makes self-care possible within health and social care, regardless of time or place.
- Citizens can manage their own tasks and staff can focus more on theirs. This means that more people receive the care they need on time.
- Self-care is possible around the clock and citizens are involved in their own care.
- The solution reduces costs and citizens receive the service they need on time.



Prerequisites for a successful implementation

Implementing a solution can be challenging. It requires a particular service provider with which the municipality will cooperate. It also requires some reform of health and social care. Residents must be notified about and trained in the use of the e-service.

The organisation decides to implement the solution and enters into an agreement regarding usage with the company. The company informs staff about how to use the solution. The organisation must appoint a person to coordinate the establishment work and assist during the implementation.

The solution is easy to use via a website, it increases the independence of users and helps them take responsibility for their own care. Secure identification is required in order to log in, such as bank ID or a mobile certificate. Basic technical skills are sufficient.

Users' comments

"Messages, scheduling and chat are the most widely used functions in Oulu Self Care. These functions make it possible for citizens and healthcare professionals to communicate. The users are satisfied with this service, which allows them to manage their own care tasks, book appointments and contact health professionals. Some of the services that have traditionally been managed by phone or by means of visits can now be managed via the website. When the chat function was added, we did not have to make any additional efforts to communicate with or educate our citizens: they found the new contact channel and have just started using it. And they love it!"

Anne Rajala, IT systems specialist in the City of Oulu



Conclusion

The solution can be used in municipalities and is aimed at municipal residents. It can also be expanded. The solution has no geographic boundaries. The content can also be tailored to local needs.





New digital services for healthcare and social care

E-health services

available for everyone and at all times in Iceland

The health portal in Iceland is a web application that offers citizens secure digital access to their own health information and e-health services. The portal is integrated with the Electronic Health Register (HER) and provides access to health information and e-health services for citizens via a single access point, whenever and wherever it is needed. Approximately 30% of Iceland's population aged 16 and over use the health portal, and the number of users is increasing.

The health portal has been implemented at a national level in all primary care clinics, some hospital units and a number of private clinics. There is a single access point for citizens where they can access their health information and available e-health services, regardless of which hospital, primary care clinic or private clinic they have used. This is possible because medical records are linked together at a national level in Iceland. Each person has a unique ID, and patient data is transferred via Iceland's HealthNet and with the aid of patient index services. Access to the health portal is free of charge for private individuals and healthcare institutes.

In order to access the health portal, it is necessary to have eID. Parents have access to their children's health data up to the age of 16. The aim of the health portal is the effective use of e-health services in order to promote patient safety and quality of care.

Iceland's health care has lagged behind when it comes to the implementation of online services compared to other sectors in recent decades. The annual increase in the number of users and the use of the health portal

highlights this need. The number of users has more than doubled between 2017 and 2018. Women make up 63% of all users, with women in the 30-59 years age group being the most frequent users. Users come from all districts in the country.

The need for people to access their own vaccination records was clear over the course of one weekend in March 2019. This occurred following an outbreak of measles in the country. The use of the health portal increased by more than 400% during this weekend.

New features are constantly being developed. These include information about who has opened a health record, access to status on a waiting list, guidelines tailored to the patient's views, results of laboratory tests or the further development of more evidence-based questionnaires for self-assessment that are fully integrated in electronic medical records.



Benefits for patients

- Increased patient influence and greater patient power.
- Increased access to health care.
- Equal access for rural and urban residents via Internet connection and electronic ID.
- A patient's access to their own health information promotes patient safety.
- Participation in video conferences with health professionals (available in summer 2019).
- Secure communication with health professionals, where messages are saved in the patient's electronic medical records.



Benefits for the operation

- A patient's access to their own health information promotes quality of care.
- Send and receive secure messages to and from health professionals.
- Increased cooperation between patients and their care providers.
- Increased efficiency and reduced costs.
- Online prescription renewals reduce the number of errors associated with the use of medication.



Benefits for society

- Better compliance with the prescribed treatment. Provides more informed patients.

- Increased efficiency and reduced costs. Saves time, which can then be devoted to those who most need it.
- Reduced number of visits to clinics and hospitals thanks to the secure messaging function.

Users' comments

"It's so convenient to be able to log into HeilsuVera and manage your own case. I would like to pay my compliments for this website."

Patient

"This is quite clearly fantastic :D".

Patient



Prerequisites for a successful implementation

Critical factors for the implementation of the health portal include national coordination, shared visions, support from the administration, the involvement of users and government funding. The application must be user-friendly and easy for everyone to use, i.e. intuitive. In addition, the solution must be free of charge for users.

The biggest challenges relate to human factors. There was resistance from doctors, which delayed the implementation of the system for months. There is evidence to suggest that some of the doctors were concerned that they would lose some control, especially when it comes to messaging between health professionals and their patients.

Iceland has a national infrastructure that uses Icelandic HealthNet to share health information at a national level. All state healthcare institutes, as well as the majority of private clinics and care homes, share health information through HealthNet and interconnected electronic medical records. The health portal is connected to electronic medical records via HealthNet.

In order to support implementation at a national level, policies and legislation have to be in place at a national level.



Follow-up and evaluation

The Directorate of Health in Iceland, the National Centre for eHealth unit, is responsible for both the ongoing development of the health portal and for implementation at a national level. Each healthcare organisation is responsible for implementation within their own organisation.

To monitor whether an implementation has been successful, indicators for

measuring e-health must be available. The Directorate of Health in Iceland, the National Centre for eHealth unit, monitors the use of e-health services and accessibility by analysing log data and surveys according to the recommendations of Nordic eHealth Benchmarking (NeRN, 2014).



Conclusion

The aim is to achieve secure and equal access to healthcare services and patient data for citizens, with the seamless sharing of information at the right time promoting patient safety, increased quality of health care and improved patient outcomes for health and well-being.

The health portal is user-friendly and easy to use. It does not require any specific knowledge on the part of the users. However, citizens must have their eID in order to log into the portal, so as to protect sensitive health information.

The health portal has gained both national and international recognition. In 2014, it received the Icelandic Web Award, while in 2015 it gained recognition for innovation in the public sector. In 2017, it also became part of the OECD's Observatory of Public Sector Innovation.

Response service

helps municipalities to act on information

The Respondent Service is a response service in Norway. It has proven to be a prerequisite for the successful implementation of welfare technology. Many municipalities have implemented welfare technology services. This increases the information flows to the municipalities' activities. The response services play a major role in helping the operations to act correctly on the information that comes in.

In Norway, around 340 of the country's municipalities are involved in the national welfare technology programme. Almost a hundred of the municipalities have been part of the programme since 2013, and a large number of these municipalities have implemented a number of welfare technology services. These include some of the services presented earlier in this publication, such as mobile safety alarms with GPS, digital night monitoring and medication dispensing robots.

Through the implemented services, information flows are increasing to the municipalities' operations, for example in the fields of alarm services, home help and home care. This requires structure and prioritisation of all information, as well as how the operations should act on incoming information, known as response services. Quality assurance is also required in relation to information transfer and the robustness of the digital systems. These challenges were highlighted in the early years of the national welfare technology programme, and in 2016 the programme published national recommendations for the introduction of response services. Recommendations regarding organisational models, quality of service, skills and dimensioning are factors that the municipalities have to take into account in their planning of future response services for welfare technology solutions.

Several of the development municipalities in the National Programme for Personal Connected Health and Care in Norway have established a response service that receives, evaluates, documents and responds to alarms and information from welfare technology solutions used by service recipients.

The transition from analogue to digital welfare technology solutions will open the door to new opportunities – both in relation to which event technology can detect how service providers can communicate with service recipients, as well as how equipment is monitored and managed.

The Norwegian National Programme for Personal Connected Health and Care is a targeted initiative aimed at further developing health and social care services through various technical solutions and products, which are designed to support and strengthen users' safety and security. Welfare technology should facilitate greater independence, increased co-determination and improved quality of life.

Read more about the respondent service in Norway:
www.helsedirektoratet.no and search on the theme of welfare technology.

Freedom of choice with **automated meal system** in the home

Everyone should eat a nutritious hot meal at least once a day. In Oulu Municipality, people who are unable to cook for themselves and who cannot go out to eat, have an automated meal system in their home instead. This system allows them to choose what they want to eat.

Many municipalities offer the delivery of prepared meals to citizens. The most common solution is where the municipality delivers hot or cold meals to people with home care. Users do not normally have the option of choosing what they want to eat. They have to eat whatever the kitchen cooks.

A meal service with an automated meal system allows home care users who can't cook for themselves to get hot, nutritious meals. The users can choose both what and when they want to eat. The automated meal system stores 18 meals, and then provides the users with spoken instructions on how to heat up the food.

The users receive a meal service in their homes. The system is made up of a freezer, an oven with a hot air fan and a computer. The 18 meals are delivered at the same time to the meal system in the user's home.

Different meals are placed on different shelves and the system detects which meal is on which shelf. When the user pulls out a shelf, the system states which meal is on the shelf. If the user removes the meal from the shelf, the system tells them what to do and how they should heat their meal. The system prepares the meal in around half an hour. The system defrosts the food first, before quickly heating it up. When the meal is ready to eat, the system announces this.

If the user needs help eating or preparing the meal, a timer function can be used. For example, this might entail home care staff getting the meal

ready in the system during a morning visit and then setting the timer so that the meal is ready at lunchtime when the staff return.

The system has an Internet connection, which makes it possible for home care staff to know what the user has eaten and when. This information can be used when the time comes to order more meals.

The users tend to be elderly people, although this service is suitable for anyone who has trouble preparing their meals. Over the last ten years, the service has had some 10,000 users. The service currently has 1,500 users, a third of whom are in Helsinki.

The cost of the service is based on the price per meal. There are no other costs associated with logistics or the meal service system. The average price is 10 euros per meal. The meals are more expensive than meals prepared in the municipality's own kitchen, but savings are achieved in terms of logistics (once a day – once every 18 days).

This service is used in the municipalities as a supplementary meal service. The service providers also sell the service directly to users without the involvement of the municipality.



Benefits for users

- The meal service helps users to remain living in their home, improves their quality of life and increases their independence.
- The service helps people get nutritious meals, as well as giving them the freedom to choose what to eat and when.

Users' comments

"This is actually the only service that is available to users and that allows them to decide what and when they want to eat. This service can also be used on a part-time basis: the user can visit the nearest care home to eat one day and then eat at home another day. The meals are frozen and don't get old."

Sirpa Saarela, development coordinator within home care, Oulu



Prerequisites for a successful implementation

OuluHealth Labs was used as an implementation tool for the meal service with an automated meal system.

OuluHealth Labs is a testing and development environment run by the City of Oulu, the healthcare district and the vocational college. Companies can

develop their products and services in a real user environment with real users. Oulu WelfareLab is the City of Oulu's part of OuluHealth Labs.

If the municipalities start using this service as a voluntary meal service, a decision-making process is required. In some municipalities, users can choose whether they want to have this service or the traditional meal service.

The meals are prepared in two different locations in Finland. Figuring out how to deliver meals to users is also a complex process for service providers.

It has been noted that people suffering from memory loss problems can also use this service. However, the service is not suitable for "gluttons" who want to eat all the time.

The system's spoken instructions can be disabled if a user finds them to be scary. The system requires a lot of space and is therefore not suitable for small apartments. The system does not require WLAN. A SIM card is included.



Conclusion

The service can be expanded, but is dependent on a service provider. It can be expanded into new user groups. For example, the service can be used by families with children who are alone at home after school.

Afterword

Digitalisation and distance-spanning solutions in health and social care are important prerequisites for maintaining the quality of the Nordic welfare model, especially within sparsely populated areas that have a higher proportion of elderly people in their population compared to more urban areas.

The distance-spanning solutions you will find in this report have, through evaluations or e.g. in other types of studies, proven to be cost-effective, provide an increased level of availability in respect of health and social care and contribute to increased levels of security and freedom for our Nordic citizens. It is important to emphasise that the implementation of distance-spanning solutions for health and social care constitutes one component in a larger process aimed at developing a future-proof service model adapted to our citizens.

Our survey of distance-spanning solutions for health and social care allows the project management and working group to observe that the needs of, and the challenges relating to, this publication's solutions are strikingly similar across the Nordic countries. There are therefore good arguments in favour of a long-term collaborative structure to enable us to learn from each other.

In our judgement, if all the Nordic countries, their regions and municipalities implement the digital services presented in this publication in full, the conditions are good for meeting the demographic challenge facing our Nordic welfare model, particularly in sparsely populated areas.

The 24 solutions presented in this report are described in greater detail, along with contact details for each region and municipality as well as for service providers of the distance-spanning solutions, on the priority project's website: www.healthcareatdistance.com.