Composite indicator:	Awareness of technology-driven public service (availability and use of telemedicine services) provision in remote sparsely populated areas		
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1. Quantitative questions

Composite Indicator 'Availability and use of telemedicine services in remote and sparsely populated areas'	**Definition** 'What does this indicator encompass?'	**Measure-ment unit** 'What are we measuring?'	**Score** Please estimate the range in which you expect the value to lie. 'E.g., the utilisation of videoconferencing units in regional hospitals lies between 45% and 55%.'		**Explanation** Please explain why this score remained unchanged, increased or decreased since the last assessment. In case the score has increased, would you say the Programme had a share in this and if so, how high was it?	**Forecast** Do you see your region on track regarding the defined target for 2023? Please indicate whether you expect your region to overachieve or underachieve the 2023 target, and explain why.
			Lower value	Upper value		
Indicator 1: Remote professional-to-patient consultations in regional hospitals and health care centres via telephone	This definition encompasses all medical consultations of patients that are delivered remotely by health care professionals in a regional hospital or health care centre via telephone.	[% of professional -to- patient consultations carried out remotely via phone]			I have few new data at this moment. Hope to get information from my contact in Northern Norway Regional Health Authority (Helse Nord RHF). This information is still not received.	
Indicator 2: Remote professional-to-patient	This definition encompasses all medical consultations of patients that are delivered remotely by health care professionals in a regional	[% of patient-to-professional consultations carried out				

consultations in regional hospitals and health care centres via video conferencing	hospital or health care centre via video conferencing.	remotely via videoconferencing]				
Indicator 3: Remote patient monitoring by regional hospitals, health care centres and social service institutions	This definition encompasses all remote monitoring of patients through the use of telecommunication technology. The definition includes the self-monitoring of vital signs and medical parameters by patients, who then report these data to health care professionals via phone, internet, etc. from the patient's home, but also the remote monitoring from a nearby health station. The transmission of data can be real time or the data can be stored and then forwarded. Also included are homecare services delivered remotely at clients' homes (e.g., the use of IT-based safety support services for elderly people like fall sensors and GPS tracking). Not included in the definition is any form of self-monitoring (e.g., of blood pressure, body fat, etc.) when no reporting of data to the health care system is involved.	[% of patients in the region whose health is monitored remotely]				

Indicator 4: Remote professional-to-professional instructions and training carried out remotely	This definition encompasses all remote professional-to-professional instructions and training for health care professionals in regional hospitals, public health care centres and at patient sites.	[% of professional-to-professional instructions and training carried out remotely]				

2. Qualitative Questions

Please answer the following questions in as much detail as possible.

2.1 Since your last assessment, have you witnessed concrete examples of **new or improved telehealth services in the area of remote medical consultations** between patients and health care professionals? Please explain in detail addressing the following questions:

- What types of new/improved remote consultations are offered, and what is the reason for offering them remotely?
- Who offers them and to whom?
- Are they routine services secured for the long-term?
- How well are these new/improved services utilised? If they are currently underutilised, what are the reasons (e.g., insufficient demand, scepticism of patients and/or health professionals, technical issues, etc.)?
- How satisfied are patients and health care professionals with the new/improved services?
- Did these new/improved services already have any tangible impacts (e.g., improved access to health services in remote areas, improved quality of services, cost savings, etc.) and/or intangible impacts (e.g., change in attitudes towards telehealth, increased competence of health care personnel in using technology for carrying out consultations remotely, etc.) for the patients and health care professionals involved? We are also interested in anecdotal evidence of concrete cases of impact or transformation.

Are the routine services secured for the long-term?
Most of the systems are part of long-term services. Many pilot-municipalities is getting more digitalised in health services. They are part of a program partly financed from the County office. If they share their experiences toward other municipalities, they will get support from both the County office and the National Directorate of Healthcare. Those who haven't installed the services can get economic support to learn the use of digital services, for instance by working for a short period in the more experienced municipalities.

How well are these new/improved services utilised? If they are currently underutilised, what are the reasons (e.g., insufficient demand, scepticism of patients and/or health professionals, technical issues, etc.)?
There is still a national program in using pilot-municipalities to use different programs/utilities to ensure the quality of using the systems. Nordland was includes in this program with two projects (including seven municipalities). Nordland county has now five projects including 39 of 44 municipalities. These projects are financed both nationally and locally. Their experiences will be outsourced and shared to everybody in health services. This program has its last year in 2020.

How satisfied are patients and health care professionals with the new/improved services?
Over all there is a positive attitude towards new and improved services, dependent on the quality of training and education in using the systems. Patients and their relatives experience more safety in provided by the new systems and equipment.

Did these new/improved services already have any tangible impacts (e.g., improved access to health services in remote areas, improved quality of services, cost savings, etc.) and/or intangible impacts (e.g., change in attitudes towards telehealth, increased competence of health care personnel in using technology for carrying out consultations remotely, etc.) for the patients and health care professionals involved? We are also interested in anecdotal evidence of concrete cases of impact or transformation.
The users of the different new systems (both health personal and users) still give positive feedback. The possibility of getting and delivering help in a more equal and safe way is positive. The possibility of alarming the helpers is easier because of digital alarms (not analogue alarms connected to the analogue telephone system) and feels safer.

Some of the new services are not available yet (but in the plans).
There are plans for using Skype for business in consulting polyclinic patients. These patients have long distances to travel just for one-hour consultation. It takes time and costs money for the society and healthcare systems. The plan now is to use the Skype solution between three municipalities (Beiarn, Gildeskaal and Saltdal) and the main hospital in Bodoe as a pilot-project. The municipalities are rigging doctor's office, nursing homes and offices for homecare health professionals with the necessary equipment. Hopefully the project will be initiated this year. The distances from the district municipalities and the hospital is at least one hour. This means saving of time and costs. There will hopefully be cost-benefit results for both the hospital, the municipalities, the healthcare personal and the patients.

Another new pilot project in Vesteraalen, is using Skype or Healthnet between doctors in the periphery and specialists in the local polyclinic or local hospital. Vesteraalen is a regionwith long distances. As an example it takes more than 3 hours from Andoey municipality by car to the local hospital at Stokmarknes. The project wants to use Skype or Healthnet in the contact between district doctors and the specialists in the hospital, to find out if the patient needs acute care and therefore needs ambulance, or if he/she can come to the hospital with other transport. In the district of Vesteraalen there

are only two ambulances. It is important to use them for the neediest patients. Hopefully the project will be activated during 2019.

There is a local project called www.digipro-helse.no that use a digital platform to increase the quality of healthcare systems. Both in quality assurance of the procedures in caring, but also in using systems which need to be updated. This can be procedures in using medical devices (automatic dispensers for medicine), alarm-systems, GPS-locating devices e.g. The project is a cooperation of nine municipalities in mid-Nordland (Beiarn, Saltdal, Fauske, Soerfold, Gildeskaal, Meloey, Steigen, Hamaroey and Tysfjord). The project is expanding.
The demand in having a system that improves the quality and security in municipality healthcare is increasing.

The platform will include the Medical Handbook for doctors in 2019. This will improve the use of updated medicine-information for both doctors and nurses.

2.2 Since your last assessment, have you witnessed concrete examples of **new or improved telehealth services in the area of remote patient monitoring or tele homecare**? Please explain in detail addressing the following questions:

- What new types of patients' medical parameters are monitored remotely, or which telehealth services in the area of remote monitoring of patients' medical parameters have been improved? What are the reasons for monitoring them remotely?
- What type of tele homecare services are offered, and what are the reasons for monitoring clients remotely?
- Who offers these remote monitoring services and to whom?
- Are they routine services secured for the long-term?
- How well are these services utilised? If they are currently underutilised, what are the reasons (e.g., insufficient demand, scepticism of patients and/or health professionals, technical issues, etc.)?
- How satisfied are patients and health care professionals with the new services?
- Did these new services already have any tangible impacts (e.g., improved access to health services in remote areas, improved quality of services, time and cost savings, etc.) and/or intangible impacts (e.g., change in attitudes towards telehealth, empowerment of clients to manage their own health, increased competence of health care personnel or patients in using technology for carrying out consultations remotely, etc.) for the patients and health care professionals involved?
- We are also interested in anecdotal evidence of concrete cases of impact or transformation.

What new types of patients' medical parameters are monitored remotely, or which telehealth services in the area of remote monitoring of patients' medical parameters have been improved? What are the reasons for monitoring them remotely? What type of tele-homecare services are offered, and what are the reasons for monitoring clients remotely?

Who offers these remote monitoring services and to whom?

The whole region of Nordland has rigged the internet so well that the municipalities have outsourced analogue alarms for all home living patients. They have now digital alarms with larger range and a lot of possibilities for giving medical information. The alarms are not only for home safety, but can be used for surveillance e.g. blood pressure, heart rate and blood sugar (and more). This gives both hospital and local health care professionals the possibility of surveillance of home living patients longer. The demand of inpatient could be lowered.

A new system called "Room-mate" is installed in both private homes of patients and in institutions. This system is a digital surveillance of patients that need to be helped in care situations. Instead of going home to check if a patient is OK or asleep at night, a digital camera can give information if he/she is in bed or not. It can also activate an alarm if the patient e.g. is out of bed, has fallen or achieved an epileptic seizure. The surveillance is connected to a database the can send information to health care personals smartphone. Bodoe municipality has started using this system in wide scale and have a lot of positive experiences.

Many institutions for especially patients with dementia and institutions for mentally disabled people have rigged the rooms for different types of alarms. The institutions are using places surveillance of patients with diseases that demand 24/7 care. It can be seizures epilepsy or other diseases that can cause injuries if the patient is left alone without surveillance. Institutions for people with dementia or mentally disabled people can have GPS-surveillance for monitoring the patient both inside the institution and outside. This is regulated in a special law. Using new technology has given the patients more safety and for some more freedom and quality of life.

The new possibilities due to this technology gives people the chance of staying home longer. The systems give safety for home living patients and is also a safety for relatives. User surveys supports this experience.

2.3 Since your last assessment, have you witnessed concrete examples of **new or improved uses of telehealth technology for instructions among health care professionals** as well as **training for health care professionals** working in regional hospitals and public health care centres that are **carried out remotely**? Please explain in detail addressing the following questions:

- What are these new or improved uses of telehealth technology for instructions and training?
- If new types of remote training are offered: Who delivers the training and to whom?
- How satisfied health care professionals with these new technical possibilities and how much do they use them?
- Did these new uses of telehealth technology already have any tangible impacts (e.g., reduced waiting time for patients, higher utilisation of available technology, better access to further training for staff in working remote areas, etc.) and/or intangible impacts (e.g., increased competence of health care personnel in using technology for remote consultations, instructions or training, changed attitudes, etc.) for the patients and health care professionals involved?
  We are also interested in anecdotal evidence of concrete cases of impact or transformation.

It is, because of the improvement of digital net, possible to rig systems for home living patients. An example is laptops for direct contact with e.g. nurses or physiotherapists. This contact gives safety (face to face conversation) but can also increase the results of rehabilitation of patients after being in hospital. There is local testing of using VR-glasses for training of patients after apoplexy. And there are programs for e.g. diets, work-outs and gaming programs for elderly.

How much the professional caretakers use the new technology depends of the training and understanding of new possibilities. If the training and implementation is to short or not understandable, the caretakers don't use it. A leader said: "it is 10% equipment and 90% training/implementation". All these new systems and digital tools should be nationally regulated. It is a high cost for a small municipal to invest in systems and tools that are useless in a few years. There are also many providers of systems that aren't tested enough in quality.

The whole county is now part of an increasing use of welfare-technology. The County office is encouraging the municipalities to cooperate and gives financially support to the bigger municipalities that are willing to support smaller municipalities. Nordland has municipalities sized from 490 inhabitants (Traena) till 50 000 inhabitants (Bodoe). This financial support has given results, and as documented through the increase of participants in 2019.

The technology that will be used is:

1. Digital safety packages and health professional response center.
    a. Establish welfare technologic solutions as safety packages that make it possible for patients to feel safe and give them a possibility to live longer at home. All municipalities have during 2018 changed all analogue safety alarms with new digital safety alarms/safety packages. The use of a health professional response center will during 2018 be established in several municipalities. This will hopefully reduce the pressure in ordinary home health care.
    Integration between the sensor technology and the health journal system will also be a part of different local projects.
2. Patient warning in health- and care services.
    a. More municipalities will establish welfare technological solutions with safety packages customized for people living in cooperated houses and institutions, based on the welfare technological platform. This was established in Bodoe in 2016. Their experience will help other municipalities to establish these systems. These solutions include positioning (indoor and outdoor) and access cards and access control to doors and/or different areas in the cooperated houses and institutions. The solutions also include possibilities for securing the whole area.
3. Alarm system in health- and care services.
    a. More municipalities will establish welfare technological solutions for the employees (emergency alarm) both indoor and outdoor. These solutions include positioning (indoor and outdoor) and access cards and access control to doors and/or different areas in the cooperated houses and institutions. The solutions also include possibilities for securing the whole area.
4. Digital interaction.
    a. More municipalities will establish welfare technologic solutions for two-way (patient-health care personal) communication (audiovisual real-time transmission, picture, video). Digital cooperation shall have different accesses and use the journal system as base.
5. Distance monitoring.

   a. More municipalities will establish welfare technologic solutions including e.g. other medical monitoring, including digital couching. Medical handling including digital couching (checking that the patient gets medicine at the right time), digital supervision based on receiving alarms when patients fall or e.g. leave the institution, tracking with warning and following, digital guidance targeting different training arrangements, and give opportunities for dialogue with the dependents and other volunteer actors in the health care sector. The purpose is to be able to measure more often the use of time and reduce the use of time in test-sampling.

6. Administrative welfare technology.
   a. More municipalities will develop a platform of established welfare technology to include new innovative solutions to deal with the new demands for safety creating technologies, mastering technologies and welfare technologies. This includes organizational grips to optimize the operational organization in the health- and care division
7. Privacy and information security related to welfare technology solutions.
   a. More municipalities will work with analyses of safety and risks, guidelines for internal control and consent, and guidelines for privacy and information security linked to sensor technology. This must have a continuous focus and be developed paralleled with the development of technology and the different welfare solutions established.
8. Regional welfare technological solutions.
   a. More municipalities will rig welfare technological solutions to be used as examples in other municipalities in Nordland or Norway.
9. Education.
   a. It is crucial for the implementation of welfare technology that education is given out scale to established teams.
   If welfare technology shall meet expected results, is it essential that all parts of the organization receive/achieve education in the area. Bodoe municipality has during 2016 started educating parts of the organization. This will continue for the whole organization in 2017 – 2020. More municipalities will be part of the national program and will share experiences with each other on different solutions.

2.4 Since your last assessment, has **the availability of technology and devices** enabling telehealth services in your region changed (improved or worsened)? Please refer back to your 2015/2017/2019 assessment and consider

- videoconferencing facilities
- broadband connection in regional health care centres and hospitals
- remote patient monitoring technologies (e.g., instruments and devices that can be used by patients to measure medical parameters autonomously, and transmit data via secured internet connection)
- a secure and interconnected IT system that also allows secure access from outside the hospital or health care centre (e.g., for the exchange of data)

Videoconferencing facilities are more used. Maybe more used in coaching for new groups in health services than in 2017. Smaller municipalities are better equipped now than in 2017 and can use the systems in more areas.

Broadband connection in regional health care centres and hospitals are much better and the connections are much more stable.

Remote patient monitoring technologies (e.g., instruments and devices that can be used by patients to measure medical parameters autonomously and transmit data via secured internet connection). The possibilities are there and in small scale in use in some areas. Will be increased in most areas to monitoring patients living at home to control e.g. blood sugar, blood pressure and as fall alarms. The systems and connections are available and will hopefully increase used by GPs, nurses and hospitals. The systems are also much more stable (lines and electricity).

A secure and interconnected IT system that also allows secure access from outside the hospital or health care centre (e.g., for the exchange of data). The Health Governments goal is to have one digital journal for all the patients in all parts of the health care system. Both for the municipalities, GPs, policlinics and hospitals. The communication is getting better in safe sharing of necessary health/medical information.

2.5 Since your last assessment, has **the utilisation of available of technology and devices** enabling telehealth services in your region changed (increased or decreased)? Please refer back to your 2015/2017/2019 assessment and consider all technologies and devices listed there.
The systems are getting stronger and all areas of the county has connection. Fibre cables are installed in all municipalities and 4G connections and 4G+ is installed over the entire region. The uses of smartphones in the different parts of health services are more used, e.g. unlocking doors, sending information and using as digital monitoring/surveillance.
2.6 Since your last assessment, did you witness a change (improvement/worsening) in the factors hampering expansion of telehealth services in your region? Please relate/refer back to your 2015/2017/2019 assessment. In case barriers have been reduced since your last assessment, would you say the Programme had a share in this and if so, how high was it? We are also interested in anecdotal evidence of concrete cases of impact or transformation (e.g., a structural reorganisation of the health care system). Please consider **2.6.1 Organisational barriers**, e.g., the organisation of health care in the region and the level of cooperation and coordination between the different governance levels, health care providers, social security, etc., but also the lack of technical support for health professionals, or the additional costs incurred from the introduction of telehealth services?
There is still a need for outsourcing quality ensured systems in the indifferent municipalities due to size and communication. There is still a big need for support from experienced users. Municipalities with experience will have to share experience with those who haven't. The County Officer of Nordland's financing-program for this cooperation seems to have effect. Communication between the hospitals, the district policlinic departments and the municipalities has improved. There is always a gap between need to know and the possibilities in getting customized information.
2.6.2 Legal and regulatory barriers, e.g., in the area of data security and privacy?
The law of limiting the use of GPS tracking seems to limit the use. Some health centres (especially for people with dementia deceases) have tried this as a system for improving life quality and the good results have led to an increased number of patients using this system. For this limited group it has been a success. Laws limit the use of surveillance with cameras and alarms. The use of "Room-mate" (digital surveillance) has a wider possibility for use. The County office gets lots of questions concerning the use of different systems and what is allowed or not.
2.6.3 Technological barriers, e.g., the lack of interoperability of computer systems and common data standards, poor level of equipment and IT connectivity of hospitals and health care centres, ?
The stability has been greatly improved (net and electricity).
2.6.4 Attitudinal barriers and lack of awareness, e.g., negative attitudes towards the usefulness and usability of telehealth services of healthcare professionals and/or patients, fear of increased workload, lack of awareness about available technology and telehealth services?
Back-up systems are installed, but digital alarms depend of net and can be technically vulnerable in Nordland's geography and weather. The municipalities must have plans for crises due to weather, accidents e.g. The systems must have human back-up-solutions more than technical back-up.
2.6.5 Lack of capacity and skills, e.g., the lack of familiarity with ICT, lack of confidence to use or ease of use of telehealth systems or the lack of training in using available technology and devices?
The smallest municipalities are the most vulnerable. Half of Nordland's 44 municipalities are under 2000 inhabitants. The County medical office support especially the small municipalities because of their need to learn from the experienced bigger municipalities. A lot of municipalities in Nordland have long experience and have also tried different ways of organising their services.