Project report

Qualitative improvement of health services for indigenous people in remote areas in the Nenets Region

Conference and Workshop in Naryan-Mar, Nenets autonomous okrug, Oct. 08th-12th 2013

Workshop WP1
Workshop WP2
Workshop WP3
Workshop WP4

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Summary: The conference and workshop in Naryan-Mar in October 2013 was an important milestone in the project. In conjunction with the official start of the project wide project information was brought to the participants, health workers in the NAO, authorities and potential partners. The conference and workshop was widely covered by the media, so that the "man on the street" was informed about what was going to happen about eHealth in the NAO. The regional network will be developed by people in the NAO in cooperation with Norway/NST in terms of consulting and knowledge transfer. Our goal is qualitative improvement of health care to population in remote regions and nomadic Nenets.

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Preface

This project was initiated following an inquiry from the Nenets autonomous okrug (NAO) to the NST in 2012. NAO was then in the initial stages to build the regional telecommunication medical networks, to improve health services to the population in the remote districts, especially nomads. The authorities of NAO realized that good quality service was more than just buying equipment. They wanted NST’s experience and knowledge in organization, health economics and social aspects to build a network. NAO was willing to put a substantial contribution in the project. The project will mainly be based on the experience the NST has gotten under their previous projects in North-West Russia:

"Telemedicine in North-West Russia" (1996-2001)
"eNOMAD-eHealth for reindeer Herders in the Kola Peninsula" (2006)
"The heart link-eHealth contribution to life quality for people with cardiovascular diseases in North-West Russia" (2008-2009)

All these projects were funded by the Norwegian Barents Secretariat and were in compliance with the main guidelines of the Barents cooperation in the field of health. The project group has participated in an earlier mission from the Norwegian Directorate for health in the Arkhangelsk region. Project manager was Odd Arild Haugen. In January 2010 the group travelled through the region to examine options for using eHealth solutions in emergency traffic accidents. This resulted in the report: «Bruk av telemedisinske løsninger i akuttmedisin mellom sykehus». (Translated: "Use of telemedical solutions in emergency medicine between hospitals"). ISBN 978-82-8242-013-6. In other words, participants of this project have experience with the health care system in Russia, in particular in North-Western Russia.

The project "Qualitative improvement of health services for indigenous people in remote areas in the Nenets Region" is scheduled for implementation within two years. In essence this report describes the first but important step in the project: providing all health workers in the NAO with information. Start-up seminar aimed to initiation of all work packages. Special emphasis was placed on the informing the population in the NAO. Therefore there were interviews in the media, such as TV, radio, newspapers and web-based media.

Meetings in Naryan-Mar in October 2013 were an important milestone and of great importance for the further development of the project. The meetings gave insight and possibility to set up pros and cons of telemedicine and tele-medical solutions in the rural areas. Another focus was the criteria for successful use of the welfare technologies. Meeting attendees had the opportunity to discuss how to work together in the regional network. Meetings in Naryan-Mar were inspiring for the health workers, especially for the 17 who came from distant health posts. The Norwegian-Russian agreement for further cooperation was updated.

The authors would like to thank the partners from NAO for the necessary information and additional documents. Special thanks to Vladimir Iljin, Anton Karpunov, Natalya Lysak and Sergey Kungurtsev. The NST would like to thank the contributor, The Norwegian Ministry of health for their goodwill and funding. This will help NST to transfer skills to the population in the NAO - a typical northern region - advice and support them in their efforts to improve health services in outlying and especially for the indigenous people who live a nomadic life.
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1 Introduction

The project B13349 funded by Barents Health Program, is a follow-up of a request from the Nenets Autonomous Okrug (NAO) health authorities and an initial joint workshop between NAO, Arkhangelsk Regional Hospital, the University Hospital of North Norway (UNN) and the Norwegian Centre for Integrated Care and Telemedicine (NST) that took place on 10-11th April 2012 in Naryan-Mar, funded by Barents-secretariat (project 127002 “Kompetanseutveksling og opplæring i telemedisin og e-helse”) and by the NAO Administration.

The NAO is characterized by vast and inaccessible regions, and problems with recruiting and maintaining qualified health professionals in the rural areas. Telemedicine has been, and still is, considered as an appropriate tool to provide health care services to people living in rural areas connecting local health facilities to central hospitals. However, the challenge is to ensure adequate use of technologies on a regular base, to train and re-train health professionals and to develop a legal and financial framework for distance health services. This project will support the federal programme for monitoring pregnant women and infants using the Nenets Telemedicine network.

The project is conducted in compliance with state health programs in Russia on the modernization of healthcare, Order of RF Government of 12.10.2012. No. 1906-r "On approval of the implementation plan for the concept of sustainable development of the indigenous peoples of the North, Siberia and the Far East" and the regional program "Modernization of the healthcare in the Nenets Autonomous Okrug". September 18, 2013 President Vladimir Putin signed a list of instructions to improve the accessibility and quality of medical care. Among other things, there are measures to implement remote medical services in practice, including telemedicine.

1.1 Background

Nenets Autonomous Okrug (NAO) has a population of 42,000, half of it living in the city of Naryan-Mar. The total territory is 176,000 km2 which gives a population density of 0.3. Some settlements are located 500 km apart from their neighbours. There is no surface transport connection between Naryan-Mar and villages in the Nenets region. The birth rate has been stable for many years, about 17/1000, with about 700 births per year. The two largest health care institutions in the NAO are the Nenets regional hospital in Naryan-Mar (NOB) and the Central district polyclinic in Zapoljarnyj municipality. NOB is the only hospital in the region with specialized services (internal medicine, surgery, pediatrics, neonatology, intensive care unit, psychiatry, diagnostics unit), including responsibility of air ambulance to all settlements in NAO.

In addition, 7 small clinics, 8 health centres and 24 midwife stations provide services to people in remote settlements. Out of 15 remote locations, five were chosen as a kind of "base" for people who work with reindeer and for their families.

The main mode of transport is by air, also for health purposes. Aviation is used for both emergency medical treatment and planned consultations (screening). NAO is spending NOK 18 million on evacuations by air every year, NOK ca. 3 million for patient travels. Weather conditions are not always permitting transport by air which is a challenge for providing health services to the population.

The Nenets indigenous people are the largest group of indigenous people in Russia with 41,000 people according to the census of 2011. In NAO, the Nenets are a minority of the population with 15-18%. Due to their nomadic way of life and the long distances between settlements, they have limited access to health care services and health education in general.
Telemedicine in NAO started 12 years ago with the implementation of the Russian federal programme ‘Children in the North’. Already during the first year, almost 50 tele-consultations were conducted between the hospital in Naryan-Mar and the Regional Hospital of Arkhangelsk. In the period 2000-2011, a total of 1,819 telemedicine consultations took place, among these 680 for children. The cases vary from Cytology, Orthopaedic, Trauma, Neurology, Cardiology, and more.

Partners from NAO need to improve their competence in the organization of work in regional telemedicine network, how to coordination the work, logistics etc. Furthermore, they need knowledge on how this system can be used to health promotion and information about how to maintain a healthy lifestyle.

More specifically the partner-cooperation in the project shall look at:

- How distant locations served by health workers can communicate with specialists at regional hospital in Naryan-Mar.
- How to get them to use technology that is really simple, but that can seem intimidating to them.
- How to educate, recruit, involve and engage new employees.
- How to do the mother-child monitoring distantly without sending pregnant women and infants to specialists by aircraft which takes about 2 hours one way.
- How to use technology to promote healthy lifestyles and prevent lifestyle diseases.

### 1.1.1 Equipment and Communication

This project differs from previous Norwegian-Russian projects, eg. “Telemedicine in North-West Russia”, 1996-2001. Equipment and communication via satellite is in place.

In 2000, a telemedicine unit consisting of a computer, a microscope with digital camera, a scanner and a printer, was established at the hospital in Naryan-Mar. Distant consultations used a store-and-forward system. On January 29, 2008 the first video conferencing session between the hospital in Naryan-Mar and the Regional Hospital in Arkhangelsk took place. In 2012, Naryan-Mar had approximately 350 remote consultations and 10-12 video-conference consultations with the Regional Telemedicine Centre in Arkhangelsk.

NAO has already invested substantially in telemedicine. Basic telemedicine equipment is in place in all the places that are going to be linked in a common telemedicine network within the NAO. Communication between small hospitals / health centres and NOB will be done via satellite. Communication between NOB and hospitals in Arkhangelsk will continue in the same way as it has been since 2000.

### 2 Purpose and objectives

The overall aim of the project is to improve health and social situation for people living in the remote regions of Nenets, especially the nomad indigenous population. The objectives of the project are the following:

- To strengthen the primary health care service to the population of remote settlements and the indigenous people in the Nenets region.
- To support the programme of health monitoring of pregnant women and infants in first 12 months of their life.
- To develop and implement a telemedicine training programme for health professionals at the 15 remote health facilities of the Nenets region.
- To develop a package for legal, financial and organizational policy and incentives for health professionals to support the use of telemedicine.
- To ensure that the technology in use at the health facilities is adapted and tested.
- To establish a professional international network on eHealth in inaccessible regions in collaboration with the ESA Ambassador Platform, [www.telemed.no/esa](http://www.telemed.no/esa)
3 Work packages

A work group has been established in NAO, see Chapter 8. Key persons meet regularly by videoconference between Tromsø and Naryan-Mar to update the project status and work.

The parties agreed to collaborate along several lines as there are similar challenges and potential benefits in joining forces and learn from each other in this area. Several of the health facilities in NAO have telemedicine systems in place. However, to ensure the functioning of health service, organisation, regulations, motivation and training is crucial. The Norwegian part of the project will contribute with knowledge and expertise on the integration and sustainability of technologies in health service provision.

Work on the project is organized into four work packages (WP). All packages are complementary and are in accordance with the purpose (see more the project description).

3.1 WP1. Primary Health Care Service

The aim of this work-package is to improve the accessibility and quality of primary healthcare services to people living in remote settlements and the nomad indigenous population. Furthermore, the WP will support the federal programme for monitoring pregnant women and infants using the Nenets Telemedicine network.

Preventive medicine and early detection of deceases can be provided through arranging medical monitoring of reindeer herders at times when they stay near the villages.

The monitoring programme of pregnant women includes history taking (including obstetrics), physical examination and assessment of prenatal risk factors.

3.1.1 Expected results WP1

- Early detection of deceases by improved medical monitoring of the population.
- Improved healthcare service provision to pregnant women.
- Improved logistics and transportation to the regional hospital for delivery.
- More frequent and quality assured monitoring of infants (first 12 months) and timely provision of medical aid and care.

3.1.2 WP1 indicators

- The medical examination systems installed in the five most remote settlements in the NAO: Amdarva, Ust-Kara, Karata, Nes’ and Oma.
- 80% of the pregnant women living at the selected settlements enrolled in the program.
- 90% of infants living at the selected settlements enrolled in the program.
- Basic training and awareness workshop conducted.

3.2 WP2. Training

The aim of this work-package is to develop and implement a remote consultation training programme for health professionals in NAO. The training will be based on user needs which will vary according to the users’ background and previous experience with technologies for health provision.

3.2.1 Expected results WP2:

- All health professionals at the selected sites completed a basic telemedicine training course.
- Training workshops done.
- E-learning material produced.
- Train the trainers programme established.
- Open support-line established (telephone and web).
- Improved knowledge and skills for health workers.
- Improved patient safety and quality of care.

3.2.2 WP2 Indicators:

- 75% of health professionals at the selected sites completed telemedicine training.
- Context-based e-learning material produced.
- Open support-line established.
- Hands-on training conducted.

3.3 WP3. Legal, financial and organizational policy

The aim of this work-package is to develop a set of incentives and a structural framework to secure the use of telemedicine in NAO. The framework should be specifically developed for the special situation in NAO, but with a generic part (check-list) that may be used by other health care systems.

3.3.1 Expected outcome WP3:

- Recommendations on policy and motivation for telemedicine in NAO.
- Practical guidelines for telemedicine incentives.
- Increased awareness about the barriers and benefits of telemedicine.
- Ensuring that telemedicine services are provided within the legal frameworks.

3.3.2 WP3 Indicators:

- Baseline study of eHealth legislation and financial situation in NAO.
- E-Health incentive framework developed for the specific situation in NAO.
- Workshops for developing of guidelines conducted.

3.4 WP4. Technical support

The aim of this work-package is to ensure that the existing hard- and software at the institutions involved in the project are able to communicate and that the service can be of optimal use. In this project we will focus on further developing the existing ways and methods for interaction between NAO and specialized centres in Arkhangelsk and Russia in general.

3.4.1 Expected outcome WP4:

- Interoperability of systems.
- Virtual helpdesk established.
- Recommendations for telemedicine systems in remote health posts.

3.4.2 WP4 Indicators:

- Additional technology implemented and adapted at each health facility.
- Virtual technology helpdesk established.
- Recommendations for the telemedicine systems established at remote health posts.
4 Conference and workshop

This conference and workshop was the first and maybe the most important stage in the project. The workshop was the start of all work packages in the project: WP1, WP2, WP3, and WP4.

Project partners from NAO contacted NST in August 2013 with a list of topics they wanted to learn more about during the conference and workshop.

Norwegian participants were chosen according to their competence and in accordance with specified topics. The representatives were telemedicine consultant Oddvar Hagen, biomedical technical advisor Elisabeth Sjaæeng, video consultant Stig Karoliussen, project leader Svetlana M. Bye, legal advisor Leif Erik Nohr, safety advisor Eva Skipenes and international advisor at UNN Magne Johnsen.

13 presentations were made by NST. Info materials on the relevant topics were translated into Russian and were handed out at the conference. Leif Erik Nohr and Eva Skipenes were prevented from travelling, and so made their presentations on videoconferencing.

Project partners in NAO organized the conference and workshop. The day before the conference the Norwegian delegation joined some of the Nenets project partners in preparing the agenda for the workshop. It was also agreed that there would be:

- Simultaneous interpretation during the seminar (both Norwegian and Russian).
- Information to the public to use the microphone when they ask questions.
- Completion of questionnaires.
- Agreement on who will be interviewed by the press; from the Norwegian delegation Svetlana M. Bye, Magne Johnsen and Oddvar Hagen.
- For the videoconferencing to NST (Tromsø) on 09th and the 11th of October we agreed to have a test 30 minutes connection before the videoconference starts. Stig Karoliussen attended this test connection.
- Lunches and coffee breaks for all the participants were booked at the Conference Centre in advance.

Seminar was held in “Culture and Business center "Arctica" in Naryan-Mar on 9 – 11 October. Total number of 76 participants were recorded.

Anton Karpunov opened the seminar by welcoming everyone and giving some practical information.

Olga Bartashova, deputy governor for social affairs in the Nenets region gave the welcome speech. She spoke about the status of telemedicine in the area and the transport issues. She said that telemedicine was more frequently used for distant learning and video conferencing. This project focuses on indigenous population, primary health care, interaction and its main task is to improve health services in our okrug. She thanked the Norwegian colleagues for their help to improve health services in the region. She congratulated everybody with the 20 years anniversary of the Barents cooperation, and said that ‘health’ is the most successful area of this cooperation between Norway and Russia.

Magne Johnsen passed on greetings from Norway and talked about the project's history. He said: “UNN is grateful for this opportunity to share their expertise with the Russians”. He also said: "We can see that the NAO has made good progress in telemedicine”.

The conference and workshop lasted for 3 days, 10 hours each. The Russian partners conducted a detailed transcript of the debates, questions and answers for all three days. This is great help for further work on the project as it is the discussion and active participation of personnel from remote areas will help to make plans for future development of the project.
The work during the conference and workshop can be characterized by open atmosphere and honest debates. The chairman watched the program to make sure that there was time for questions and answers.

Picture 1. Opening of the conference. Vice-governor for Social Affairs Olga Bartashova (in the centre) is welcoming the participants.

The media were well represented, and were active throughout the conference. They asked questions regarding telemedicine in NAO and Norway, and further plans of the project.
During all three days the population of the NAO was informed about the event via television, radio and newspapers. Publications in the media:


4.1 Program

Discussions on the program started a month before the seminar. Final details of the program were agreed upon between the Russian and Norwegian partners on Monday the 8th of October. (See Appendix 10.1)

The program consisted of three days, with general aspects on day one, and more specific themes and telemedicine in practice on day two and three.

4.2 Participants

On day one the conference had about 70 participants with representatives from the NAO Administration, NAO Directorate of Health Care, NAO Directorate of International and Interregional Relations, NAO Directorate of the Indigenous People, NAO Directorate of Natural Resources and Environment, NAO Assembly, etc. (see Appendix 10.2).

On day two and three there were representatives from the regional hospital, all local hospitals and remote health centers of the NAO.

After the seminar, all participants received a certificate.
4.3 Presentations

NAO sent the Norwegian delegation a list of topics they wanted to discuss, and these topics were widely presented in all fields.

The presentations were well designed, and well-illustrated. Participants received good information through the visual medium. Some topics were of special interest, and were discussed by the participants. The atmosphere was good during the presentations and discussions.

Examples of presentations:

![Data kommunikasjon og internett](image)

*Figure 1: Infrastructure by Stig Karoliussen*

Selection of the slide shows telemedicine solutions in the project "Født med bredbånd (Eng: "Birth of Broadband"). Distances in Nordland - here presented in Lofoten and Bodø - are large as in the Nenets. Telemedicine solution with ultrasonic device and CTG monitoring can be used to provide better health to pregnant women.
Figure 2: Examples from the project «Født med bredbånd» by Elisabeth Sjøaeng
Figure 3: Qualities in the use of videoconferencing in telemedicine by Oddvar Hagen
4.4 Discussions

The program was arranged in the way to make it possible to ask questions and discuss the topic of each presentation. The discussions were open and honest.

4.4.1 Organization of health care and patient care

After the presentations “NST and offshore Telemedicine” and “Training and Health Personnel” there were questions from the audience about how to get consent from the patient when the patient is unconscious, how to take exams using videoconferencing and distance learning? And a question about if in Norway a specialist flies to the patient and how many patients are treated by using videoconference?

One of the answers was that telemedicine is a planning tool. In Norway it is common to fly to the patient, but we have examples when after using VK health personnel can treat the patient locally (no need for flying).

After the presentation "The role of a consultant", it was suggested that the need for distant education could be met using “telemedicine” and that these courses would provide a certificate. From Norway there was a question about – “what will provide equal health care in the Nenets region?”

Their answer was that they would like to offer:
- Telemedicine.
- Ambulant/mobile team.
- Preventive Health Care.
- Strengthening of local health competence for health workers and local people.

The purpose is to reduce the need for transportation from remote regions so that the patient could receive the necessary treatment locally.

During 9 months in 2012 89 consultations were held using telemedicine. The savings on travel expenses was approximately 900000 rubles and on accommodation - about 600000 rubles. I.e. For 9 months 1.5 million rubles were saved.
4.4.2 Specific Medical Devices

According to clinical needs, you only need to choose the type of equipment (NOT brand or model) Example: stethoscope, blood pressure monitor, pulse oximeter, dermatoscope etc.

4.4.3 Security and Law

During these presentations it was said that videoconferencing in emergency situations is not used by the least experienced - but by those with the most experience. It should have been the opposite.

When it comes to information this is a challenge in small places. Everyone knows each other and it's easy to see who they speak about. The challenge is to keep others from obtaining the information.

Questions about privilege: who should have access to patient records? Eva replies that this should be the one who needs to know - "Need to Know! In Russia, this is controlled by the use of a role matrix (doctors), while in Northern Norway it is determined by the security officer, department head and the HN-IKT".

4.4.4 Infrastructure

After Vladimir Iljin's and Stig Karoliussen's presentations we received the following information about infrastructure in the NAO:

Satellite is operating all the time, 24/7/365, bandwidth is 64 Kbps but can upgrade to 2Mbps. Offline services are the most used. Videoconferencing is used for training / education from leading medical centers in Russia. The hospital leases satellite communications for remote areas. Satellite antennas are located in the settlements (satellite communications company: State communications company, Elektrosvjaz).

On the coast, there is broadband communication. Naryan-Mar has fiber communication (ie broadband) to Moscow and Arkhangelsk.

In the future the aim is to establish a "HealthNet" in the Nenets region.

4.4.5 Biomedical equipment and telemedicine solutions

After Elisabeth Sjaaeeng's presentation there was a question about specifications and investment in medical and ICT equipment. It's important to specify what the use of the equipment will be before making the technical specifications.

A close collaboration between health care professionals and engineers is needed for the development of specification requirements. Equipment must be purchased in accordance with national procurement rules.

Those who received the equipment must ensure its compliance with the specification requirements.

The presentation shows that there are examples when videoconferences reduce the number of admissions.

It is important to have someone responsible for technical support of all telemedicine services.
Round table meeting was held as a kick-off meeting of the project's work packages - and as an extension of the seminar. The meeting was held at the hospital meeting room where there is video conferencing. The delegation from UNN and NST participated the meeting in place, and three advisors from NST - on video conference.

Participants from the NAO:
- Sergey Kungurtsev - project coordinator from the Nenets Autonomous Okrug
- Andrey Vokuev – Head of the information office in Naryan-Mar, Barentsekretariatet
- Natalia Lysak - consultant at the Directorate of International Relations of the Nenets Autonomous Okrug
- Alexander Kovyazin - doctor, specialist in sports medicine
- Olga Telegina - doctor, specialist in preventive health care
- Anton Karpunov - Chief Physician, Nenets Regional Hospital
- Vladimir Ilyin- head of Telemedicine Department, Nenets Regional Hospital
- Leonid Zubov, doctor, DM, specialist in pediatrics

The delegation from Russia posed a number of questions about how they could get to make good telemedicine solutions. The capacity of satellite communications was also discussed as it may limit the use of video conference for telemedicine (see Chapter XXX of this report). It was also pointed out that it is important to discuss all the organizational issues and make a decision in place before starting with telemedicine. The telemedicine service must be continuous to reach the goals of the project.

During the meeting it emerged that personnel of remote health facilities must have the possibility for an internship in Tromso. It was agreed that employees from remote regions would come to UNN for an internship. It was proposed that the internship would be held at district medical centers (DMS) placed in Finnsnes and Nordreisa. The internship will take place at the same time as the Arctic Frontiers conference held in January 2014.
It was agreed that there should be a written response from the delegation in Naryan-Mar on what they had learned at the seminar. It was also agreed that any questions which participants had to Norwegian partners could be sent by e-mail directly to the NST. Lawyer at NST, Leif Nohr will assist with contracts on the purchase of equipment. Round table discussion finished at about 4:00 p.m.

![Round table discussion using tele-presence from Norway](Picture 6: Round table discussion using tele-presence from Norway)

5 Results of the conference and workshop

The conference and workshop was an important opportunity to "take the pulse" by the most of project participants. At the same time it was important to gather information to make project adjustments as early in the project cycle as possible.

We noticed that there occurred changes in the perception of the project's importance. This happened thanks to the open discussion, presentations about the pros and cons of e-health, possible "bottlenecks" in the implementation of electronic solutions with examples from Scandinavian projects etc.

5.1 Participants' opinion on eHealth solutions

A form was provided before and after the seminar where participants could express their opinions about e-health. The participants represented mainly 4 groups: health professionals, patients, health administrators and personnel who work with ICT. All said that what was needed was better motivation and informing of the population and health care professionals about telemedicine/e-health. Improvement and more stability of the existing lines of communication/Internet and modernization of medical technical equipment by local hospitals/health centres are necessary. Specific comments & suggestions were sorted and divided into groups.

5.1.1 Health personnel

All health care providers should know the principles of telemedicine. Not only doctors. Today telemedicine is not particularly interesting for health care professionals in general.

Telemedicine in Russia is well developed. But in the NAO health care professionals need more information about the possibilities of telemedicine use. Stimulation/motivation of health care providers to use telemedicine more often must be facilitated. Legal protection has to be provided to the attending physician so that he is not the only one having the responsibility for the decisions taken by the consultant. Financial incentives can be used for increasing the personnel's interest; doctors should understand that telemedicine consultations improve their medical knowledge.
The diagnostic devices should be connected to the equipment that provides telemedicine communication. Good telemedicine training should be given to health care workers. Telemedicine can be used at health posts by midwife (FAP), where the doctor's instruction says that elective patient can have consultations using telemedicine to solve organizational problems (e.g. equipment, medicine, legal aspects).

More modern equipment has to be purchased; Improvement of Internet access and other communications equipment should be ensured, for instance, better security. It is desirable to organize more conferences like this to exchange experience. Trainee practice and observation abroad are needed for experience and practice.

There should be telemedicine protocols for various disease fields.

5.1.2 Administrators

New technologies that are good but not expensive are necessary. There has to be a continuous development of ICT and the Internet. Personnel should be trained every year in accordance with the development of new technologies. More information to patients and care providers should be given via the media and TV.

5.1.3 Patients

The internet communication with remote regions must be improved. For the nomadic people who do not live in the towns, it is not possible to use such a technology. When you’re visiting the doctor, you must be given the opportunity to get information and get specialist consultations.

5.1.4 ICT personnel with medical background

The authorization level for health professionals should be extended. Telemedicine should be expanded everywhere. Intensive assistance at home. Introducing a separate patient group, outpatient: non-acute treatment using telemedicine. Facilitate telemedicine locally. There is no need to develop telemedicine technologies if communication in the NAO is not good enough, for instance speed/bandwidth is not enough.

Technical support available when needed has to be organized.

Medical equipment must be compatible for using telemedicine. Correction/changing the opinion of the population about health and medicine. Structuring of the work of health personnel in accordance with work instructions.

5.2 Technical issues

5.2.1 Infrastructure and videoconferencing-communication

Videoconferencing (VC) is very high on the list of telemedicine services mentioned when talking about communication with rural areas. There is no doubt that VC service is helpful, but it is probably also one of the most demanding type of data stream that can be transmitted in a communication network.

Technically this is a paradox because the infrastructure is often not dimensioned, or is very expensive to get prepared for high quality VC service in rural areas.

The Nenets region is not an exception in this. There is high-speed, good quality land-lines in Naryan-Mar, but there are no land-lines to any of the rural areas.
This leaves the only option to use satellite communication for all telemedicine services. This can work very well for a wide range of services, but is extraordinary technically challenging for VC for two main reasons:

**Cost of high-speed satellite data channel.** The normal low-cost data channel on the satellite today is typically 64-128 Kbps. This is suitable for simple mail and images of mid-range resolution and size. High quality VC connection demands about 1024 Kbps two-way channel, with no deviation or interruptions on the bandwidth. It is possible to buy this wide channel on the satellite, but this is expensive. The actual cost is a question of negotiations with the satellite provider and of course, how much VC communication is used.

**Communication latency.** A satellite in a geostationary orbit (following the earth rotation) has, because of the distance and the laws of physics, a minimum delay of approx. 240 ms (almost a quarter of a second), from one ground-based transmitter to the satellite and back to another ground-based transmitter.

International Telecommunication Union (ITU) has published a recommendation (ITU G.114) to evaluate the effect of the delay from the moment something is said, until it is heard on the other side:

![Figure 4 Mouth-to-ear-delay/ms](image)

The figure shows that we are on the edge of good quality experience because of the satellite delay alone. In addition, we have some small delay in ground-network and processing time for the VC units. Therefore, we can expect some dissatisfaction and problems from the delay when trying to have real-time VC communication on a satellite-link. The communication will still be useful.

### 5.2.2 Conclusion of infrastructure and VC

High-quality VC should not be expected to be the first telemedicine service for implementation when only satellite-lines are available. It is not impossible, but it has its quality limits and is expensive. Because of this, a **real need** should be identified before starting implementation of this particular telemedicine service.

### 5.2.3 Developing the optimal solution through organization and technology

On a narrow satellite line, we cannot get the optimal HD videoconferencing service. Videoconferencing is preferable, but not always necessary. It is possible to build a high-class service, based on a combination of technologies and organization. When the lines limit the
service, we must optimize the use of the lines related to most needed services. In other words: How can we get most health services out of each Kbs?

How can we find the optimal solution? The project aims to optimize the services required to provide proper control over the children in the nearest health center.

The connection between what procedures are needed, and what is the simplest way to do this procedure, is the main task. The needed technologies and needed tools will follow the list of procedures.

When the needed technology is ready, we can clearly say what bandwidth we need.

The needed technology can be compared with the existing technology and thus evaluated. Is it necessary to buy new technology, and how this technology will function in the system, and in the network and in connection with other technologies in the network? The chosen medical technology should fit and be standardized with the transmission and communication technologies.

The connective technologies make it possible to build a network and develop an organizational solution for the benefit of children in NAO.

The whole solution can be based on the best possibilities in cooperation between local health resources and the hospital services in Naryan-Mar.

What are the alternatives? Usually the best way of building good solutions is to combine technologies. Medical devices today normally have the possibility to be linked to a computer. Old medical devices normally don’t have a direct connection, but may have possibilities to transform results into an it-based system. All possibilities have to be transformed into a logical and good system for health workers.

A way of doing this is to put up a list with all wanted examinations, and evaluate the best, and most simple possibilities. In an overview it will be possible to see what we have, and what must be purchased.

A list can also show what services can be solved in connection with other services in common use, and what need a separate kind of examination equipment.

An overview can be done like this:

List of all medical examinations done to children within the project.

The total list of wanted examinations can be done like this:

- Examination procedure ➔ Suitable equipment ➔ Needed Bandwidth to transfer ➔ Procedure / Reply / Documentation

In some cases, we will prefer examinations done by video. Heavy files like video can be transmitted as offline service, especially if there is no demand doing this in real time. In each service simple solutions for doing the job should be evaluated and searched for. In many types of medical data, there are multiple ways to organize the service, and alternative technologies to use. A lot can be earned from well-planned and thought through project, combining the right technologies for the right service.

Technologies to use, by themselves or in a combination: low quality Video, one way-video, one way video combined with sound, low quality video combined with high quality still picture, written data or curves, combined sound and video communication as store and forward.

5.2.4 Equipment

Medical equipment will be added to the basic video-conferencing systems already in place at the local health facilities, and should consist of hard- and software connected via a digital interface to human physiological data sensors. Data processing will be made automatically. The unit will be operated by one person employed at the local health post and each consultation should take no more than 30 minutes.
ARMIS is a system that is in use in Russia today. One set of this equipment was taken to Naryan-Mar and is already being tested. Test results will be evaluated and used to purchase provisions. The system is a compact, universal hardware and software package, which is connected via digital interface sensors for physiological parameters of the patient. ARMIS is suitable for prophylactic examinations and health screening of children and adults at small rural health centres.

The Russian partners started out with testing the ARMIS equipment. One piece of this equipment is being tested now. The test group has reported to the manufacturer that they were not completely satisfied with the equipment.

During the conference the video information of the TELEMEDICA Company was shown. The conclusion was that NOB should make a list of small units of medical equipment that should be placed at health stations and small hospitals in the rural areas.

The equipment should be chosen using important criteria:

- Infrastructure
- Local needs
- Clinical qualifications
- Compatibility
- Standard package
- Standard data presentation and protocols
- The one which works in Norway

NST will do quality reviews.

5.3 Training / work practices

Changes were made in the plans for work experience which is the next step in the project. Project planning provided work experience for super users from NAO by NST. After the conference and workshop, it became clear that health professionals from remote health institutions need to examine how telemedicine works in district medical centres (DMS), in Nordreisa and / or Finnsnes in Troms County. In addition, it turned out that people responsible for the policy needed to be better acquainted with the NST work on legal and information issues.

5.4 New agreement

After the conference and workshop project participants understood that the original agreement on cooperation had to be adjusted. Therefore the Norwegian-Russian project group unscheduled the meeting on the last day in the NAO, where during two hours changes to the original agreement were discussed and finally a new agreement was signed. Updated agreement is attached 10.6

6 Information dissemination

During our stay in the NAO we wrote an abstract for the international conference Arctic Frontiers 2014, the annual conference in Tromsø in January. Partners from NAO will attend the lecture.

A post about telemedicine in the NAO was written to the IX Northern social-ecological conference "Russian north: perspectives, forecasting, risk management". Publications in the media:

Information sheet about the project was and will be used in various relevant forums. The project will be presented by the Russian partners on the conferences in Arkhangelsk in November and in Moscow in December 2013.

7 Training for the personnel of the NAO health facilities

During the period of August - October 2013 medical officers of the NAO health facilities were educated to work on a telemedicine station and in the NAO system of TM consultations planning. The first training workshop was held on August 8-10, 2013, 4 specialists took part in it. Two more training seminars were held on October 7-14, 2013 and were timed to coincide with the conference and workshop in Naryan-Mar so that professionals from remote settlements could participate both in trainings and in the conference (see Appendix 10.6). Totally 17 professionals from 14 health facilities of NAO which have telemedicine stations were trained (see Appendix 10.7).

Following the results of testing of trained specialists 6 of them (35%) can work independently, 9 specialists (53%) need practical skills, one specialist (6%) requires additional training in computer skills and cannot work independently, 1 specialist (6%) participated only in the conference.

8 Summary

The conference and workshop in Naryan-Mar in October 2013 were an important milestone in the project. In conjunction with the official start of the project participants, health workers in the NAO, authorities, and potential partners were informed about the project. The conference and workshop were widely covered by the media, in order to inform the "man on the street" about what was going to happen about eHealth in the NAO. The regional network will be developed by people in the NAO in cooperation with Norway/NST in terms of consulting and knowledge transfer. Our goal is qualitative improvement of health care to the population in remote regions and nomadic Nenets.
9 Contacts/ Workgroup NAO

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
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</tr>
</tbody>
</table>
10 Appendix

10.1 Conference and workshop program

Wednesday, October 9, 2013

9.30 – 10.00  Registration of participants
10.00        Opening of the seminar. Welcome speech
            Deputy Head of the NAO Administration on social issues
            Olga Bartashova
            Welcome speech
            Magne Johnsen, Advisor, University Hospital of North Norway (UNN)
            Presentation of the project «Qualitative improvement of health services for
            indigenous people in remote areas in the Nenets region»
            Project manager Svetlana M. Bye, NST, UNN
            Advantages of Telemedicine
            Oddvar Hagen, Telemedicine Consultant, NST, UNN
            Interviews

12.00 – 13.00 Lunch
13.00 – 14.00 Strategic approaches to the legal framework and barriers (videoconference)
            Leif Eric Nor, Legal Adviser, NST, UNN
14.00 – 15.00 Information security and the sensitive information (videoconference)
            Eva Skipenes, Data-security Councillor, NST, UNN
15.00 – 15.15 Coffee break
15.15 – 16.15 Practical experience of applying telemedicine in NAO
            Vladimir Ilyin, Nenets Regional Hospital
16.15 – 16.45 Practical experience of applying telemedicine in Archangelsk region
            Leonid Zubov, Northern State Medical University, Archangelsk
16.45 – 17.00 Presentation of Telematica equipment (videopresentation)
            Mark Sozonov, Moscow, Russia
17.00 – 18.00 Practical experience of applying Telemedicine in Norway. Oddvar Hagen

Thursday, October 10, 2013

            Providing remote areas with high-quality communications
            Stig Karoliussen, Engineer, Technology Adviser, NST, UNN
11.30 – 12.30 NST and the Offshore Telemedicine. Oddvar Hagen, NST
12.30 – 13.30 Lunch
13.30 – 14.30 Training of health personnel. Oddvar Hagen
14.30 – 15.30 Rules of work - requirements for telemedicine communication. Oddvar
            Hagen
15.30 – 16.00 Coffee break
16.00 – 16.30 The role of a consultant
            Leonid Zubov, Archangelsk Regional Hospital
16.30 – 17.30 Home Telemedicine. Welfare technology
            Elisabeth Ellefsen Sjaaeng, Engineer, Technology Adviser. NST, UNN

Friday, October 11, 2013

09.30 – 10.30  The use of wireless technologies together with medical equipment
            Elisabeth Ellefsen Sjaaeng
10.30 – 11.30 Medical equipment in Telemedicine solutions. Elisabeth Ellefsen Sjaaeng
12.00 – 13.00 Lunch
13.00 – 15.00 Round table discussions
10.2 Participants (in Russian)

1. Барташова Ольга Валентиновна, заместитель главы Администрации НАО по социальным вопросам;
2. Белугин Александр Егорович, депутат Собрания депутатов НАО;
3. Назаренко Анастасия Аркадьевна, начальник Управления ИнформСвязь НАО;
4. Блинкова Ирина Александровна, начальник Управления здравоохранения НАО;
5. Ардеев Алексей Иванович, начальник Управления по делам коренных малочисленных народов Севера и традиционным видам деятельности НАО;
6. Морев Денис Васильевич, исполняющий обязанности начальника Управления труда и социальной защиты населения НАО;
7. Калашникова Анастасия Степановна, ведущий консультант отдела недропользования Управления природных ресурсов и экологии НАО;
8. Кислякова О.А., специалист отдела административно-хозяйственного обеспечения ООО «Башнефть-Полюс»;
9. Тимощин Евгений Федорович, начальник сектора материально-технического обеспечения и информатизации Управления здравоохранения НАО;
10. Мкроусов Сергей Николаевич, главный инженер ГУП НАО «Ненецкая компания электросвязи»;
11. Брезкин Виталий Викторович, заместитель главы Администрации муниципального района «Заполярный район»;
12. Семенов Игорь Сергеевич, специалист отдела по работе с малочисленными народами Севера Управления культуры, молодежной политики и спорта Администрации муниципального района «Заполярный район»;
13. Кунгурцев Сергей Станиславович, начальник отдела международных и межрегиональных связей Управления ИнформСвязь НАО;
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16. Апинц Андрей Ананьевич, заведующий организационно-методическим кабинетом КУЗ НАО «Центральная районная поликлиника»;
17. Мартошенко Сергей Николаевич, фельдшер КУЗ НАО «Красновская амбулатория»;
18. Турундаевский Анатолий Игоревич, главный врач КУЗ НАО «Нижне-Пёшская участковая больница»;
19. Латышева Валентина Николаевна, и.о главного врача КУЗ НАО «Омская участковая больница»;
31. Вокуев Андрей Алексеевич, руководитель Информационного центра Норвежского Баренцева Секретариата в г. Нарьян-Маре;
32. Белошицкий Василий Андреевич, ГБУЗ «Окружной противотуберкулезный диспансер»;
33. Карпачева Елена Михайловна, ГБУЗ «Окружной противотуберкулезный диспансер»;
34. Фахретдинов Ринат Розийович, ОАО «Ростелеком»;
35. Кузнецов Алексей Николаевич, директор филиала ООО «РГС-Медицина» - «Росгосстрах – Нарьян-Мар – Медицина»;
36. Вельченко Александр Александрович, специалист-эксперт сектора материально-технического обеспечения и информатизации Управления здравоохранения НАО;
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44. Левчакин Валентин Александрович, территориальный фонд обязательного медицинского страхования;
45. Павленко Светлана Юрьевна, заместитель главного врача НОБ по роддомовспоможению;
46. Рождественская Наталья Ивановна, врач-педиатр детской поликлиники НОБ;
47. Ковязин А.В., врач-реаниматолог ОМИТ;
48. Филиппов Павел Вячеславович, инженер-программист ОМИТ;
49. Семко Ирина Константиновна, юрисконсульт;
50. Морозова Инна Викторовна, инженер по обслуживанию медицинского оборудования;
51. Каюмов Камил Юлдашевич, врач отделения скорой помощи;
52. Ильин Владимир Юрьевич, начальник отделения телемедицины;
65. Телегина Ольга Николаевна, начальник отделения медицинской профилактики;
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67. Прудова Ирина Иосифовна, врач по гигиеническому воспитанию отделения медицинской профилактики;
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70. Рудницкая Елизавета Адольфовна, врач-неонатолог акушерского отделения;
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73. Оддвар Хаген, консультант по телемедицине Норвежского центра телемедицины Университетской больницы Северной Норвегии;
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75. Стиг Каролиссен, инженер, советник по технологиям Норвежского центра телемедицины Университетской больницы Северной Норвегии;
76. Светлана Мананкова Бюе, руководитель проекта.
10.3 Project information flyers and other supplementary material
Prosjektark:

Forbedring av helsetjenester til urbefolkningen i Nenets

Bakgrunnen:
Nenets autonome område (NAO) ligger i det nordøstligste hjørnet av Russlands europeiske del. Territoriet på størrelse med Finnmark, lyder tilflukt til lystfiskere og 42 000 inboddere, 800 av dem er nenets, og 700 av disse lever fortsatt som nomader.

Januar 2012 fikk NST forslag om samarbeid fra administrasjonen i NAO.


Formål:
Kvalitativ forbedring av helsetjenester til bebefolkningen, særlig nomadbefolk. I fremtidig prosjektstruktur i Nenets autonome område (NAO).

Metode:
Kompetanseutveksling fra NST til NAO basert på erfaringer NST har fra andre samarbeidsprosjekter i Nordvest-Russland. NST skal gi konferanse/utstillingsforberedelse til medisinsk behandling og overføre organisasjonskommunikasjon mellom NAO og regioner.

Prosjektet starter med et faglig workshop i Naryan-Mar der representanter fra alle involverte parter møtes og diskuterer medisinsk, tekniske, organisatoriske og juridiske aspekter ved telemedisin og -helsetjenester. Førstige begynner helsetjenester skal brukes til testspiller på utstyr til overvåking av helse hos gravide og barn, samt forbedre samhandling mellom sjukehus og regioner.

Prosjektarbeidet skal i hovedsak utføres lokal med NST som rådgivende støtte.

Prosjektforløp:
2 år, oppstart 01.07.2013.

Finansiering:
Helse- og omsorgsdepartementet via Byrø for Helseprogram. Egeninnomtatt, Russiske parter.

Prosjektmottagere:
Regionsykehuset i Naryan-Mar. Lokale helsestasjoner i NAO. Administrasjonen i NAO. Regionsykehuset i NARYAN-MAR. Barnevernhuset i Arkhangelsk.

Kontaktperson:
Svetlana Manankova, Byrø for Helseprogram.
Universitetssykehuset Nord-Norge HF.
Nasjonal senter for samhandling og telemedisin.
Postboks 35
9036 Tromsø

Vladimir Iljin

nober@gmail.ru
Nenets regionalt hospital.
Pyrorting, 13 A
160000 Naryan-Mar
Russland

www.telemed.no
10.4 Certificate

СЕРТИФИКАТ
Настоящий сертификат удостоверяет, что

принял(а) участие в работе
стартового международного семинара по проекту
«Качественное улучшение медицинского обслуживания коренного населения
Ненецкого автономного округа в труднодоступных районах»
г. Нарьян-Мар, 09.10 – 11.10.2013 года

Руководитель проекта

С.Е. Машникова-Бое

Координатор проекта

С.С. Кулгурцев
**10.5 Updated agreement/Protocol**

**PROTOCOL**

On October 11, 2013 a working meeting was held between the partners of the project “Qualitative improvement of health services for indigenous people in remote areas in the Nenets Region”. The following representatives of partner organizations took part in the meeting:

- **Svetlana Manankova Bye** Project manager
- **Magne Johnsen** Adviser to the Director, University Hospital of Northern Norway
- **Oddvar Hagen** Telemedicine Consultant, University Hospital of Northern Norway
- **Elisabeth Elefsen Sjaaeng** Engineer, Technology Adviser, University Hospital of Northern Norway
- **Stig Karoliussen** Engineer, Technology Adviser, University Hospital of Northern Norway
- **Sergey S. Kungurtsev** Head of the international and interregional relations department, NAO Directorate of International and Interregional relations, Information and Mass media
- **Natalia K. Lysak** Lead consultant of the international and interregional relations department, NAO Directorate of International and Interregional relations, Information and Mass media
- **Anton A. Karpunov** Chief medical officer of the State budgetary healthcare institution "Nenets Regional Hospital"
- **Vladimir Yu. Ilyin** Manager of the telemedicine department of the Nenets Regional Hospital

During the meeting participants summed up the implementation of the Protocol of meetings between the North Norway University Hospital delegation and the Nenets Autonomous Okrug authorities and healthcare institutions, signed during the visit of the North Norway University Hospital delegation to the Nenets Autonomous Okrug (NAO) on April 10-11, 2012. The parties stated that for the implementation of the Protocol indicated a working group was formed with the purpose to develop the project and prepare an application for funding to the Barents Health program of the Royal Norwegian Ministry of Health and Care Services. “Qualitative improvement of health services for indigenous people in remote areas in the Nenets Region” project application got approval and funding in accordance with the declared budget.

The project is implemented in line with Russian state health program on modernization of health care system of Russia and the Order of the Government of the Russian Federation dated 12.10.2012 # 1906-p “About approval of a plan of actions to implement the Concept of sustainable development of the indigenous peoples of the North, Siberia and Far East”.

Within implementation of the project (working package 2) the readiness of personnel to the use of electronic solutions in practice and conditions for it in remote health care facilities of NAO are being studied. The results obtained are taken into account when training health professionals of health care facilities to practically use telemedicine.

According to the approved project timeline (Annex 1) a kick-off international seminar took place in Naryan-Mar during the period of October 9-11, 2013. Representatives of the University Hospital of Northern Norway, NAO Directorate of International and Interregional relations, Information and Mass media, NAO Directorate of Health care, State budgetary healthcare institution “Nenets Regional Hospital”, medical personnel of NAO health facilities took part in the seminar (Annex 2).

The reports on cooperation of Norway and Russia in the sphere of telemedicine, practical experience of applying telemedicine in the Norwegian health care system, information security, legal requirements, development of telemedicine in NAO, etc. were presented during the seminar (Annex 3).

Participants of the seminar gained practical experience of applying telemedicine technologies in everyday medical practice which can be used in the conditions of remote settlements of NAO.
Members of the working group discussed further development of the project and concluded that it is necessary to expand the section of the project concerning internships. The first one will take place in the workplace at the University Hospital of Northern Norway, NST and remote health facilities of Northern Norway which use telemedicine solutions. The parties decided to take the interim results of the project and present them at the International scientific and practical conference “Arctic frontiers 2014” in January 2014 in Tromsø, Norway.

In order to optimize costs a seminar-meeting on examining the experience of the University Hospital of Northern Norway in the sphere of telemedicine and preparation of the application for funding for the second year of the project will be timed to coincide with the dates of the conference.

S.S. Kungurtsev  
Head of the international and interregional relations department, NAO

S.E. Manankova Bye  
Project manager

A.A. Karpunov  
Chief medical officer, GBUZ NAO “Nenets Regional Hospital”

Magne Johnsen  
Adviser to the Director, University Hospital of Northern Norway

Naryan-Mar, October 11, 2013.
10.6 Plan for the training of medical personnel of NAO health facilities

Workshops. October 7-14, 2013.
Work with telemedicine equipment and in the NAO system of telemedicine consultations planning.

Workshop 1
Start – 07/10/2013, end – 13/10/2013.

Participants from the NAO health facilities:
1. Out-patient clinic of Karatayka
2. Out-patient clinic of Oma
3. Out-patient clinic of Amdarma
4. Local hospital of Indiga
5. Local hospital of Kharuta
6. Out-patient clinic of Kolguev
7. Out-patient clinic of Kara

October 7, 2013 (first day)
2. General computer skills. Work with Windows 7, Office, WinRar. Must be able to create folders, Word and Excel documents, to archive, rename, copy, move and transfer files, to use discs.

October 8, 2013 (second day)
3. General computer skills (continued).
4. Internet. E-mail. Must be able to work with browsers, to use the Internet, to create, send and receive e-mails.
5. Work with camera and scanner. Must be able to take pictures, to send pictures to computer, to scan.

October 9, 2013 (third day)
6. Participation the conference.

October 10, 2013 (forth day)
7. Participation the conference.

October 11, 2013 (fifth day)
8. Participation the conference.

October 12, 2013 (sixth day)
9. Starting 3.00 p.m. Work in the system of TM consultations planning. Must be able to create, send the application and receive the answer.

October 13, 2013 (seventh day)
10. Work in the system of TM consultations planning. Must be able to create, send the application and receive the answer.

Workshop 2
Start - 09.10.2013, end - 14.10.2013

Participants from the NAO health facilities:
1. Local hospital of Oksino
2. Out-patient clinic of Nel'min-Nos
3. Out-patient clinic of Krasnoye
4. Out-patient clinic of Tel'viska
October 9, 2013 (first day)
1. Participation the conference.

October 10, 2013 (second day)
2. Participation the conference.

October 11, 2013 (third day)
3. Participation the conference.

October 12, 2013 (forth day)
5. General computer skills. Work with Windows 7, Office, WinRar. Must be able to create folders, Word and Excel documents, to archive, rename, copy, move and transfer files, to use discs.

October 13, 2013 (fifth day)
6. General computer skills (continued).
7. Internet. E-mail. Must be able to work with browsers, to use the Internet, to create, send and receive e-mails.
8. Work with camera and scanner. Must be able to take pictures, to send pictures to computer, to scan.

October 14, 2013 (sixth day)
9. Work in the system of TM consultations planning. Must be able to create, send the application and receive the answer.
### Information about the results of training for the medical personnel of the NAO health facilities

<table>
<thead>
<tr>
<th>№</th>
<th>Health facility</th>
<th>Name and surname</th>
<th>Position</th>
<th>Period of training</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Out-patient clinic of Karatayka</td>
<td>Lubov A. Mikhailova</td>
<td>Senior nurse</td>
<td>October 2013</td>
<td>Development of practical skills needed</td>
</tr>
<tr>
<td>2</td>
<td>Out-patient clinic of Karatayka</td>
<td>Galina S. Rocheva</td>
<td>Chief doctor</td>
<td>October 2013</td>
<td>Development of practical skills needed</td>
</tr>
<tr>
<td>3</td>
<td>Out-patient clinic of Oma</td>
<td>Valentina N. Latisheva</td>
<td>Acting chief doctor (feldsher)</td>
<td>October 2013</td>
<td>Training in computer skills needed, can’t work independently</td>
</tr>
<tr>
<td>4</td>
<td>Out-patient clinic of Amdariva</td>
<td>Natalia V. Ribalka</td>
<td>Chief doctor</td>
<td>October 2013</td>
<td>Development of practical skills needed</td>
</tr>
<tr>
<td>5</td>
<td>Local hospital of Indiga</td>
<td>Yakov N. Kharitonov</td>
<td>Chief doctor</td>
<td>October 2013</td>
<td>Can work independently</td>
</tr>
<tr>
<td>6</td>
<td>Out-patient clinic of Kolguev</td>
<td>Galina M. Dmitrieva</td>
<td>Acting chief doctor</td>
<td>October 2013</td>
<td>Development of practical skills needed</td>
</tr>
<tr>
<td>7</td>
<td>Out-patient clinic of Kara</td>
<td>Evgeny V. Travin</td>
<td>Feldsher</td>
<td>October 2013</td>
<td>Can work independently</td>
</tr>
<tr>
<td>8</td>
<td>Local hospital of Okaino</td>
<td>Elena V. Chernyaeva</td>
<td>Chief doctor</td>
<td>October 2013</td>
<td>Development of practical skills needed</td>
</tr>
<tr>
<td>9</td>
<td>Out-patient clinic of Nef’min-Nos</td>
<td>Elvira S. Toropova</td>
<td>Chief doctor</td>
<td>October 2013</td>
<td>Development of practical skills needed</td>
</tr>
<tr>
<td>10</td>
<td>Out-patient clinic of Krasnobe</td>
<td>Sergey N. Martoshenko</td>
<td>Feldsher</td>
<td>October 2013</td>
<td>Can work independently</td>
</tr>
<tr>
<td>11</td>
<td>Out-patient clinic of Tel’viska</td>
<td>Nina F. Trukhina</td>
<td>Feldsher</td>
<td>October 2013</td>
<td>Participated the conference</td>
</tr>
<tr>
<td>12</td>
<td>Out-patient clinic of Tel’viska</td>
<td>Valeriya V. Morozova</td>
<td>Chief doctor</td>
<td>October 2013</td>
<td>Development of practical skills needed</td>
</tr>
<tr>
<td>13</td>
<td>Local hospital of Nes’</td>
<td>Nikolay L. Susharin</td>
<td>Acting chief doctor</td>
<td>October 2013</td>
<td>Can work independently</td>
</tr>
<tr>
<td>14</td>
<td>Local hospital of Nes’</td>
<td>Nina I. Aksenova</td>
<td>Feldsher</td>
<td>August 2013</td>
<td>Can work independently</td>
</tr>
<tr>
<td>15</td>
<td>Local hospital of Nizhnyaya Pyoshla</td>
<td>Anatoly I. Turundaevsky</td>
<td>Chief doctor</td>
<td>August 2013</td>
<td>Can work independently</td>
</tr>
<tr>
<td>16</td>
<td>Local hospital of Velikoviscochnoye</td>
<td>Olga V. Zvereva</td>
<td>Chief doctor</td>
<td>August 2013</td>
<td>Development of practical skills needed</td>
</tr>
<tr>
<td>17</td>
<td>Local hospital of Khorey-Ver</td>
<td>Nikolay G. Komarov</td>
<td>Chief doctor</td>
<td>August 2013</td>
<td>Development of practical skills needed</td>
</tr>
</tbody>
</table>