

# WHO Collaborating Centre for Telemedicine and e-health

Annual report 2008

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Summary: This report gives a summary of the work performed by the Norwegian Centre for Telemedicine as a World Health Organization Collaborating Centre for Telemedicine and e-health in 2008. The activities are based on the Terms of Reference between the centre and WHO and a corresponding work plan.

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# Prefase

The Norwegian Centre for Telemedicine (NST) was designated a WHO Collaborating Centre in July 2002. On 25 August 2006, the NST was re-designated for another four years. The basis for collaboration is within the framework of the Terms of Reference:

## 1. Country work

To provide support to WHO and its Member States, as appropriate, in the establishment, development, monitoring and evaluation of projects on application of telemedicine and e-health and assessment of its impact on health systems performance.

## 2. Research and dissemination

To support WHO in:

- i. developing an evidence base on the use of telemedicine and e-health for improving access to and quality of health service delivery, and enhancing performance of health service providers;
- ii. identifying 'proven practice' in introducing telemedicine and e-health with a view to providing the most effective models of health service delivery which improve access to, and coverage and utilization of, priority health interventions, and enhance provider performance;
- iii. identifying, developing and applying approaches, methods, tools and indicators for evaluating and measuring the impact of telemedicine and e-health service provision and outcomes;
- iv. introducing telemedicine and e-health for the analysis of performance of health service delivery systems.
- v. contributing to telemedicine and e-health knowledge generation, and dissemination, through the collection of publicly available information on the applications and impact of telemedicine and e-health; identification of relevant articles in journals; web links; and other relevant materials.

## 3. eLearning/human resources development

To facilitate and contribute to WHO's global efforts in the area of health systems resource generation, in particular the development of a global eLearning network for health professionals and communities; and

To support the development and implementation of eLearning applications as a means for capacity building.

## 4. Advisory role

To provide advice and answers to specific questions on telemedicine and e-health and related issues to WHO and Member States through a "hot line" and other appropriate mechanisms.

## 5. Resource mobilization

To explore funding possibilities and mechanisms, and mobilize financial and technical resources for relevant pilot projects, case studies and capacity building.

This report is a summary of the work performed in 2008 by the Norwegian Centre for Telemedicine (NST) as a World Health Organization Collaborating Centre for Telemedicine and e-health. The centre was re-organised in 2008 and has since 1 January 2009 the name: *Norwegian Centre for Integrated Care and Telemedicine (NST)*.

In general, most activities are funded by internal NST means. A project-group of five people is allocated to WHO-Colaborating Centre issues together with a full-time co-ordinator. In addition, other

human resources are engaged in the WHO-Collaborating Centre activities based on the required field of expertise.

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# 1. Activities – an overview

The Norwegian Centre for Telemedicine (NST) is a centre of research and expertise that gathers, produces and disseminates knowledge about telemedicine services, both in Norway and internationally. The goal is to ensure the integration of telemedicine services. NST has taken a global responsibility with extensive engagement in international collaboration and was designated a World Health Organization Collaborating Centre for Telemedicine and e-health in 2002, re-designated in 2006.

The activities described in this chapter are based on the Terms of Reference (TOR) and particular requests from the WHO and its member states. The TOR indicates the broad areas of activities undertaken by the NST: country work, research and dissemination, e-learning and human resources development, advising and resource mobilization. The TOR was slightly revised in connection with the re-designation, as described in the letter of 25 August 2006. The parties agree on a work-plan covering a two year period of time. Activities are reviewed as required and action taken in line with new situations and requests from member states. Any changes in activities will have to be approved by both parties. The work-plan for 2007-2008 is included in Annex 1. Several of the items have been placed on hold following further consultation with WHO executive management. The work-plan for 2009-2010 is under preparation

## 1.1 Research support to the feasibility and assessment studies: Czech Republic eReadiness assessment

In collaboration with WHO Euro, the NST has undergone a number of preparations for performing feasibility and assessment studies for e-health readiness in European Member States. The first study was carried out to Albania in July 2007.<sup>1</sup> Except for a private initiative from Italy to develop an e-health service in the country, there have been no follow-up activities in the country from the collaborating centre's side.

In 2008, two eReadiness missions were carried out to the Czech Republic as part of joint activities on e-health between the Czech Republic and WHO Regional Office for Europe.<sup>2</sup> The purpose of the first eReadiness mission was to assess the current situation of the Czech Republic in relation to the use of information and communication technologies (ICT) for health. The purpose of the second mission was to support the Czech Republic in advancing e-health in the country from a policy perspective as defined in the biennial work plan. Further, the missions were supporting the Medtel e-health conference 27-28 November 2008<sup>3</sup> and the e-health conference 2009, EU Ministerial conference on e-health under the Czech EU presidency, 19-20 February 2009.<sup>4</sup>

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<sup>1</sup> <http://www.telemmed.no/e-health-readiness-assessment-in-albania.4468569-7398.html> checked 5 March 2009

<sup>2</sup> The activities are defined in the biennial collaborative agreement (BCA) 2008–2009; medium-term priority 2: Improving access to and efficiency of health services by improving the integration of health services with particular emphasis on public health, primary health care and social services. This priority has the country expected result to strengthen integration of health services with particular emphasis on public health, primary health care and social services.

<sup>3</sup> <http://www.medtel.cz/ps/article.php?arid=155> checked 5 March 2009

<sup>4</sup> <http://www.e-health2009.cz/Default.aspx> checked 5 March 2009

A review of background literature was conducted prior to the visits to prepare the mission team in relation to the local e-health context. During the eReadiness mission 1, the mission team provided feedback and recommendations in four main policy areas- namely, a clear vision of ICT enabled health, an appointed body to carry out the vision, enabling policies and regulations to ensure the uptake of e-health in the country is carried out effectively and safely, and opportunities specifically related to the use of EC structural funds for e-health. In the eReadiness mission 2, the mission team performed a follow up on these main policy areas.

The Czech Republic has more than a decade with experience in e-health projects and pilots, several of which are considered best practice in the field. There are already several health portals for patients, citizens and health care providers available in Czech language. There is a strong and positive will for collaboration between the stakeholders and there is an established and trusted body (MedTel) dedicated to organize and facilitate e-health events. Speakers in the MEDTEL ČNF eH 2008 conference illustrated how information and communication technologies are being used in the country for public health initiatives. In particular, presentations were given on e-health tools and services for occupational health, mobile messaging for alcohol and drugs programs, applications for the elderly and alert through home care monitoring among others. These types of applications are recommended to be incorporated in the national e-health policy.

The mission team participated in the Czech Republic e-health conference- MEDTEL ČNF eH 2008 - e-health for Users, contributing with three presentations and the panel discussion: WHO e-health policy (Enrique Loyola), e-health future and recent trends in Europe (Tove Sorensen), Large Scale Interoperability: Heterogeneous systems and Data Liquidity (Richard Granger), panel discussion: e-health in Europe (Angela Dunbar). The MEDTEL ČNF eH 2008 conference provided an excellent platform to interact with key e-health stakeholders during the mission. In total, twenty professionals were met and the following topics were discussed: (i) the institutions role in e-health in the country (past, present, future); (ii) the major needs, challenges and potentials in e-health development and (iii) if applicable, expectations of WHO in developing e-health in the Czech Republic.

The country will have access to structural funds which can be used for e-health implementation in the near future. Overall, the Czech Republic has the competencies and will for widespread e-health uptake. The mission team was pleased to see the progress since eReadiness Mission 1 and recommended that the Ministry of Health take stronger leadership in e-health- specifically in promoting the national e-health policy, performing the current infrastructure analysis, preparing a mechanism for monitoring and assessing e-health implementation and governing mechanisms to ensure the uptake is effective, safe and inclusive.

## **1.2 E-health trends: WHO/European survey on e-health Consumer Trends**

The project WHO/European e-health Consumer Trends, ('e-health Trends') is a study on e-health use and uptake in seven European countries from 2005-2007. The project ended on time and within budget on 31 May 2008. A representative stratified randomised sample was made in seven European countries: Denmark, Germany, Greece, Latvia, Norway, Poland and Portugal. A CATI-telephone survey was conducted twice in each country, in late 2005 and spring 2007. A total of 7,934 interviews were conducted in 2005, and 7,022 interviews in 2007. In the total sample, the number of Internet health users increased from 42 % in 2005 to 52 % in 2007 (from 71 % to 83 % of the Internet-users).

The growth in the use of Internet for health purposes was found in all seven countries participating in the survey. The largest relative growth of Internet health users was found in eastern and southern Europe. The project has ended as planned, on time and within budget. The survey results have shown that the Internet is gaining ground as a channel for health information in Europe. However, there is still a digital divide across Europe, and this divide matters also when it comes to e-health. These results have been disseminated to policy makers, researchers and the general public through scientific papers, conferences, meetings, the Internet, television, newspapers and magazines. So far, the project has resulted in a total of 21 scientific papers in peer-reviewed journals, some still in the process of being published and several newspaper articles<sup>5</sup>.

This project is a joint NST-WHO initiative from 2004. WHO is present in the Advisory Board of the project by Mr. Somnath Chatterji, WHO Geneva. WHO has a crucial role in the project regarding dissemination of the results as a basis for health policy development. Upon completion of the project, it is our aim that the survey will be conducted on a regular basis in all European countries forming a forum for e-health consumers. The forum will be a platform for e-health trends research focusing on the citizens' use of the Internet for health purposes and its implications. The empowerment of patients, the digital divide within Europe and within population groups are areas of interest for future research.

### **1.3 Support to the Global Observatory for e-health**

The NST has been providing support to the Global Observatory for e-health (GOe) since it was established in 2005. The Observatory's mission is to improve health by providing Member States with strategic information and guidance on effective practices and standards in e-health. The Secretariat is based at WHO headquarters in Geneva and works with active input and support of its regional counterparts in all six WHO regions. The NST has participated in the SAGE- Strategic Advisory Group of Experts for the GOe and facilitates GOe activities when requested and appropriate for the European Region. In 2008 the NST has supported the revision of the survey instrument to be implemented in the course of 2009.

### **1.4 General support to WHO and member states**

The NST receives regular requests from member states on various topics within telemedicine and e-health. These are mainly health or research institutions which are in the process of establishing a telemedicine and e-health service and therefore are investigating type of equipment needed based on independent experience with the systems. Several requests are for funding possibilities where we unfortunately are not able to assist. Last but not least are requests for coming to the NST to get hands-on experience on telemedicine and e-health. As far as we can accommodate it we receive people from all over the world for shorter or longer visits. In collaboration with the Institute of Tropical Medicine in Antwerp, Belgium, the NST offer a basic training course in telemedicine and e-health.

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<sup>5</sup> For a list of publications, see <http://www.telemed.no/list-of-publications.558678-41025.html> checked 16 April 2009

## 2. Recommendations

The Norwegian Centre for Telemedicine will continue the support to the WHO and its member states. The following recommendations have been put forward for the future collaboration:

- We would recommend that telemedicine and e-health should be considered as an *integrated* part of WHO priority areas in the coming work-plan for 2009-2010, e.g. a joint initiative on telemedicine and e-health support for the development for primary health care.
- For member states within the European Union, joint activities should take into consideration the EC policy and research programs, and the accompanied funding mechanisms.
- The NST would like to invite the WHO into the advisory board for telemedicine and e-health projects in its member states, e.g. the planned Romanian Regional Telemedicine Network (TELEREN) project.
- The NST would like to invite WHO to participate in the development of a *European network on e-health consumer trends research* which is planned as a follow-up action from the 'e-health Trends' project.
- In the coming years, the NST plan to strengthen the collaboration with the northernmost regions. This could be an area for future collaboration work.

## 3. Related activities

Being a WHO Collaborating Centre, the NST receives several requests from developing countries and economically under-served regions, which we strive to meet. Among these requests are workshops and feasibility studies as well as requests for internships and visiting scholarship to NST. These activities are mostly funded by internal NST means.

International Masters and PhD-students located at the NST are an important part of the centre's international network, in addition to researchers and students visiting the NST over a shorter period of time. In 2008, there were a total of 25 PhD-students employed at the NST, in addition to 11 at the Tromsø Telemedicine Laboratory<sup>6</sup>, where five are located at the NST office. The Masters program for telemedicine and e-health had 13 students in 2008.

In 2008 NST participated in research collaboration with Dr. Shabbir Syed Abdul, a general practitioner from India who was enrolled in the Telemedicine masters program at University of Tromsø. Shabbir's masters thesis work focused on issues related to implementing an EMR system at Sankara Nethralaya eye hospital in India. Our collaboration with Shabbir in 2008 related to helping interpret the data he collected for his thesis, and in helping prepare it for publication.

In 2008, the NST contributed to knowledge sharing on telemedicine in Algeria. The Algerian Advanced Technologies Development Centre (CDTA) organised an international workshop on the use and challenges of telemedicine on 29 November 2008<sup>7</sup>. The WITUD'08 event gathered about one hundred

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<sup>6</sup> <http://www.telemed.no/index.php?cat=77933> checked 12 March 2009

<sup>7</sup> <http://www.telemed.no/international-workshop-on-telemedicine-uses-and-challenges.4541297-7398.html> checked 5 March 2009

participants, mainly with medical background. The programme had presentations of experiences with telemedicine in Algeria and other countries. In Algeria, a national telemedicine network is being implemented to support local hospitals in the desert.



The NST entered a joint collaboration with the Royal Institute of Technology (KTH) in Stockholm, Sweden, advising on telemedicine to the Masters program on ICT for Development (ICT4D)<sup>8</sup>. Further the NST was part of the Stockholm Challenge 2008<sup>9</sup> as one of the jurors for the health projects. The overall goal of the Stockholm Challenge is to help counteract social and economic disadvantage, wherever it occurs, by promoting the use of ICT for development. It is mostly targeted towards developing regions and community or social sectors such as gender equality and minorities with the greatest needs. Late 2008, the planning of an international workshop on sustainability of e-health in low resource settings started, in collaboration with Karolinska University Hospital, Sweden and the Swedish Program for ICT and Development<sup>10</sup>.

The NST is also participating in several international projects, in particular EC funded projects. This chapter includes some of the activities that may contribute to the knowledge base for the NST as a WHO Collaborating Centre.<sup>11</sup>

### 3.1 Better Breathing<sup>12</sup>

The goal of the Better Breathing project has been to provide a new model for continuous care of COPD (Chronic Obstructive Pulmonary Disease) patients. Better Breathing is an EU-funded market validation project under the eTEN programme, and has a budget of approximately 2 million Euros. The project started in June 2007 and will end by February 2009.

According to WHO estimates, 210 million people are suffering from COPD world wide, the disease caused the death of more than 3 million people in 2005, and is predicted by 2030 to be the third leading cause of death.<sup>13 14</sup> In Norway 200,000 are estimated to suffer from the disease.<sup>15</sup>

<sup>8</sup> <http://ict4d.ssvi.kth.se/> checked 5 March 2009

<sup>9</sup> <http://event.stockholmchallenge.se/> checked 5 March 2009

<sup>10</sup> <http://www.spidercenter.org/> checked 5 March 2009

<sup>11</sup> For a full list of projects, see [www.telemed.no](http://www.telemed.no) checked 15 April 2009

<sup>12</sup> [www.betterbreathing.org](http://www.betterbreathing.org)

<sup>13</sup> <http://www.who.int/respiratory/copd/en/index.htm>

<sup>14</sup> <http://www.who.int/mediacentre/factsheets/fs315/en/index.html>

The Better Breathing project has tested and evaluated solutions for home monitoring, home rehabilitation, self-management tools and virtual communities for COPD patients and professionals. Partners from Denmark, Norway, Spain, Wales, Italy and Belgium have participated in the project, and the Norwegian partners have been NST, UNN and the Northern Research Institute (Norut). The services have been piloted on four different sites - Denmark, Norway, Spain and Wales. In the Norwegian trial, a home based rehabilitation program has been validated. A COPD rehabilitation program is a comprehensive and multidisciplinary intervention, and involves patient assessment, exercise training, education, nutritional intervention and psychosocial support.

In the home based rehabilitation programme the patients' ordinary TV and a remote control have been used as an interface to the services offered at home, while the healthcare personnel are using their ordinary PC based systems. On a weekly basis, the patients have had individual consultations with healthcare personnel via TV. A Patient Health Diary on TV has been used in the individual follow up and for self-management purposes. The diary, to be filled in on a daily basis includes predefined questions and monitoring information. On a weekly basis the patients have been exercising together under supervision of a physiotherapist and they have been participating in group based education on the TV.

The education has been given by a multidisciplinary team of healthcare personnel. This home based rehabilitation program makes it possible to reach patients who are not able to participate in out-patient rehabilitation today, either due to the distance, or because they are too ill to participate whatever the distance. Better Breathing is one of several projects in a portfolio focusing on systems and services for chronically ill. MyHealthService (2007 – 2011)<sup>16</sup> in the Tromsø Telemedicine Laboratory<sup>17</sup> financed by the research council of Norway, and Is-Active to be started spring 2009 and financed by the AAL programme, are two of the other projects in this portfolio.

### **3.2 COGKNOW<sup>18</sup>**

The COGKNOW is a three year research- and development project within the EC/IST program with partners from nine different European countries, and a total budget of 2,1 million Euros. The objective of COGKNOW is to develop a user-validated cognitive prosthetic device with associated services for people with early stage dementia of the Alzheimer disease and their care-givers. Research within the project is carried out by technical- and human factor research teams in Sweden, Norway, the Netherlands and Ireland. The project started in September 2006 and will continue throughout August 2009. The project is implemented as a research and development process with three iterations where the first iteration involves a needs assessment among persons with early stage dementia and their carers, a technical development based on functional requirements developed from the needs assessment, and a first test of a prototype COGKNOW day navigator device at three test sites, Luleå, Amsterdam and Belfast. In 2007The NST has been responsible for the human factor analysis report of the first iteration of the Cogknow project.

The first COGKNOW Day Navigator prototype consists of both a stationary and mobile device with touch screens integrated through a hub and is in principle remotely configurable. Two evaluation

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<sup>15</sup> The Norwegian National Strategy for COPD (for 2006 – 2011)

<sup>16</sup> <http://myhealthservice.itek.norut.no/>

<sup>17</sup> <http://www.telemed.no/index.php?cat=77933>

<sup>18</sup> <http://www.cogknow.eu/overview> checked 5 March 2009

cycles focusing mainly on user friendliness and usefulness of the device for supporting memory, social activities, activities of daily living and safety functionality, have been carried out in 2007-2008. A third and final evaluation will take place in 2009.

### **3.3 Competitive Health Services in Sparsely Populated Areas - e-health**

#### **Applications across the Urban-Rural Dimension<sup>19</sup>**

The Competitive Health project aims to enhance the provision and accessibility of health services in the sparsely populated areas (SPAs) of Europe. The project is mapping and identifying European best practices and innovative e-health solutions which can be transferred, further developed and integrated into health care systems in other regions. Special focus is on new e-health service concepts and solutions for primary health care, chronic conditions and remote specialist services. The implementation is carried out in phases:

- mapping e-health services in the partner countries which enables selection of the best practices for piloting
- assessing the health care sites for their technology readiness, so that services are piloted where they are most likely normalized and integrated
- launching the pilot services in selected sites.

The project will pilot up to four new e-health services in Finland, Sweden, Norway and Scotland using an implementation model which can be replicated elsewhere in the Northern Periphery and other peripheral areas of Europe. The project has seven partners within the Northern Periphery region and has a total budget of approximately 1,6 million Euros. Competitive Health is financed by the project partners and the European Union through the Northern Periphery Programme. The project period is January 2008 - December 2010.

### **3.4 The Constellation for AIDS competence: Global learning for local impact<sup>20</sup>**

The project 'Global Learning for Local Impact' is a joint collaboration between the Constellation for AIDS Competence ('Constellation') and the Norwegian Centre for Telemedicine (NST). The aim is to strengthen the Constellation by improving the training of coaching teams, in terms of quality of the training and number of coaches trained. The project is combining local, mutual training with a wide range of online tools for learning, communicating, and sharing in order to respond with quality to the increasing demand of qualified coaches. The expected outcome is an increased capability to train coaches, making the Constellation able to reach out to more communities whose competence vis-à-vis AIDS will increase. It will also enable the Constellation to share the results more efficiently. The project started on 1 December 2007 and will be finalised by 31 December 2009 with the funding from the Norwegian Ministry of Foreign Affairs. In 2008, the e-learning content has been developed and tested with the help of coaches all around the world. The NST is providing the technical platform for the project, as well as support and consulting for the content developers. A total of seven online learning modules have been developed. It is expected that about 100 coaches will participate in the program during the project period. After evaluating the first stage the modules will be refined and

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<sup>19</sup> <http://www.e-healthservices.eu/> checked 5 March 2009

<sup>20</sup> <http://www.telemed.no/the-constellation-for-aids-competence-global-learning-for-local-impact.4501159-51253.html> checked 5 March 2009

translated into two additional languages. The modules will be made freely available to other interested parties. The courses will continue after the project period, facilitated by the Constellation

### **3.5 Malawi: Improvement of Obstetric Care**

The NST is participating in the project "Improvement of Obstetric Care in Malawi". This is a joint project managed by Ullevaal University Hospital in Oslo, Haukeland University Hospital in Bergen and the University Hospital of North Norway in Tromsø. The overall objective is to contribute to reducing maternal and child mortality in Malawi by improving pregnant women's access to essential and emergency maternal and child health services. Local partners in Malawi are Bwaila District Hospital and Kamuzu Central Hospital in Lilongwe, and Malawi College of Medicine in Blantyre.

The role of the NST is to perform a pilot study with recommendations for implementing ICT infrastructure, Internet access and eLearning modules. The project commenced in 2008 and will run until the end of 2010. The project is co-funded by the Norwegian Ministry of Foreign Affairs through the Norwegian embassy in Malawi.

### **3.6 MyHealth@Age: Improved Health, Safety and Well being for Elderly**

#### **People <sup>21</sup>**

Many elderly people feel unsafe outside their homes which limits their social contacts and physical activities. MyHealth@Age aims to provide products and services making it possible for elderly people to feel safer and live a more active and healthy life.

Health and Welfare Organizations (HWO) have problems to provide good medical and welfare services to the rapidly increasing elderly population, especially in remote regions. MyHealth@Age aims to provide products and services making it possible to involve elderly people more actively in distance spanning healthcare and welfare activities. This can improve the quality and capacity within the limited resources available. MyHealth@Age will therefore be important to secure good health and well being for the increased number of elderly people the coming years.

The products and services focus on mobile safety alarms, prescribed self treatment and social networks, areas which have been identified as important by end-users. The services will be developed and evaluated through field trials (2009-2010) in close co-operation with elderly people, HWO staff, ICT companies and Universities in Sweden, Norway and Northern Ireland. Through dialogues with HWO decision makers, elderly people and market and sale partners, business models will be developed to ensure the distribution of the services after the project period.

Further, the project also aims to provide administrative services that makes it easier to interact with the elderly people to manage appointments, to transfer instructions, get structured feedback regarding medication, health progress etc. Significantly, this makes it possible to improve the work methods and processes of HWOs. This efficiency is very important in order to manage more elderly people with limited economical and personnel resources.

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<sup>21</sup> [www.myhealth-age.eu](http://www.myhealth-age.eu) checked 5 March 2009

The project has 17 partners within the Northern Periphery region and has a total budget of approximately 1,5 million Euros. MyHealth@Age is co-financed by the project partners and the European Union through the Northern Periphery Programme. The project period is January 2008 - December 2010.

### **3.7 The Nordic e-health Forum**

The Nordic e-health Forum is a forum for cooperation under the Nordic Council of Ministers. The Nordic e-health forum shall investigate and discuss legal and financial issues related to e-health across borders in the Nordic countries.

The forum consists of up to two members from each of the Nordic countries – including Greenland, The Faroe Islands, Åland and the Nordic Telemedicine Association. The forum is administered by NST.

In 2008, the Nordic council of Ministers asked the forum to clarify the foundation for the development of a common arrangement for e-prescriptions in the Nordic countries. A network of legal professionals from the Nordic countries connected to the forum is responsible for carrying out this task, which will be completed in June 2009.

### **3.8 The Palestine Telemedicine Rehabilitation Network (PalRehab.Net)<sup>22</sup>**

The Palestine Telemedicine Rehabilitation Network (PalReb.Net) project supports and connects the four national rehabilitation centres in Palestine with the use of telemedicine and e-health. The network consists of dedicated broadband lines suitable for computer and video transmission, in addition to a computer network.

During 2008 the NST has conducted several visits to the centres in Palestine to follow up the installation of the network, and install computers and video conference equipment in the centres. Unfortunately, due to the unstable political situation in Gaza, it has not been possible to include the centre in Gaza city. Implementing the services in Gaza will be done as soon as the situation allows.

The first e-learning course pilot was released in spring 2008. The content development is a joint activity between the NST and Sunnaas Hospital. The topics are chosen in collaboration with and upon request from the Palestinian rehabilitation centres. The e-learning platform is the same as for all Norwegian e-learning courses, 'Helsekompetanse.no', developed with ATutor which is an Open Source Web-based Learning Content Management System (LCMS) designed with accessibility and adaptability in mind.

The project has lasted two years commenced in 2006 with funding from the Norwegian Ministry of Foreign Affairs. The project is based on the recommendations from a pre-project conducted in September 2004. The study revealed the challenges the rehabilitation sector is facing due to travel restrictions for patients and health care personnel and the increasing isolation the region is facing.

During the project period there will be established routines ensuring a long term perspective, making the network operable also after the actual project period. The Norwegian Association of the Disabled

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<sup>22</sup> <http://palrehab.net/> checked 5 March 2009

(NAD), Sunnaas Hospital, and the Norwegian Centre for Telemedicine and Tandberg the Norwegian partners in this project.

### **3.9 PERSONA: perceptive spaces promoting independent aging<sup>23</sup>**

The European FP-6 Integrated Project (IP) PERSONA: perceptive spaces promoting independent aging, aims at the development of sustainable and affordable solutions for the social inclusion and independent living of senior citizen through harmonisation of ambient assisted living (AAL) technologies and concepts. It will develop a scalable open standard technological platform to build a broad range of AAL Services, to demonstrate and test the concept in real life implementations, assessing their social impact and establishing the initial business strategy for future deployment of the proposed technologies and services.

The project period is January 2007 – June 2010 and the project has 21 partners from Italy, Spain, Germany, Greece, Denmark and Norway. Total project budget equals € 11.629.000. The PERSONA project is divided in three project phases where the first phase “AAL modelling, specification and design” was covered by the first 12 months. The project is now in the second phase “AAL development” and the third phase of the project “AAL testing and demonstration” will finalize the last 12 month of the project.

The entire project is organised in four activities where the NST is involved in three: the business modelling and strategy, user experience and creating AAL services, and the ethical implications. During 2008 the major accomplishments have been finalizing the AAL service enrichment cycle and the definition of the refinement methodology. From this work, the user requirements specification has been finalised integrating the needs of business, care and AAL service development. Based on the services selected for piloting, the first draft of the deployment and maintenance plan has been provided as baseline for the third phase of the project.

### **3.10 R-Bay<sup>24</sup>**

The vision of R-Bay is to extend traditional eRadiology by creating an eMarketplace, a “many-to-many” connection, which will function as a commodity brokering and exchange of radiology services. The reality in Europe today is that some regions experience a shortage of radiologists while other regions have a surplus. This inequality can be levelled out by means of eRadiology. Traditional eRadiology uses point-to-point connections, often referred to as tele-radiology, between clients and providers. It is a well-established service but the set-up has restrictions because the number of providers, and thus the type and availability of expertise that can be accessed, is limited. R-Bay facilitates the viewing and consulting of images across organisations, regions or nations. On the eMarketplace, providers will make their services available at a specified price and with standardised specifications, and the costumers will buy the services via a trusted and secure network.

The R-Bay project is unique in the sense that it creates an internal market for the exchange of eHealth services. The clinical services will be exchanged across European borders as anonym images, and will thus be the first medical services in Europe that are based on market terms.

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<sup>23</sup> [www.aal-persona.org](http://www.aal-persona.org) checked 5 March 2009

<sup>24</sup> <http://www.telemed.no/r-bay.544921-51253.html> checked 12 March 2009

The R-Bay project is a follow-up of the Baltic eHealth project. The project is coordinated by MedCom International, representing the Region of Southern Denmark. The NST participates in the work-packages on legal aspects and user requirements. R-Bay is an EU-funded market validation project under the eTEN Programme, from August 2007 through May 2009. The project has demonstrated that there is a market interest. The shortage of radiologists and the increase in different radiological modalities produces needs for outsourcing mechanisms, such as R-Bay. In order to realize a marketplace in radiology the project needs to address both language barriers and security barriers. If this is solved, it may benefit the health service in many countries and increase patients' access to care at an earlier stage. The lessons learnt from the R-bay projects on barriers for providing cross-country Radiology services, are likely to be the case for other health services, hence the generic knowledge can be applied to similar areas.

### **3.11 Romanian Pilot Centre for Telemedicine**

In 2008, the NST conducted a feasibility study for a telemedicine network in the County of Arges, Romania in joint collaboration with the Romanian Regional Telemedicine network (TELEREN). The current situation in the Romanian health care system is characterized by a lack of equipment, a lack of medical personnel and thus reduced access to adequate medical services for the population. The general health score is low and, in European standards, the country has a high infant mortality, low life expectancy at birth, high general mortality produced by avoidable death causes and high morbidity rate. Romania has presently the lowest ratio of medical doctors per patient in the EU, and a rural areas experience a very limited access to health care services. This combined with a lack of modern medical equipment and long travel distances to nearest hospital create a severe health care situation for patients living in rural areas.

The development of telemedicine services is in its early stage in Romania, but there is a pressing need for alternative and innovative solutions in the health sector. There has been a considerable development in the field of computerizing the medical services in Romania in the last years. In several hospitals, electronic patient records (EPR) have been introduced, digital imaging is being made and hospital information systems have been created. The projects that have been carried out so far, however, could rather be characterized as medical informatics projects than telemedicine, and are all experimental. Institutions and private organizations have developed small scale communication networks, but these are neither interconnected nor integrated into an expanded network.

The project period was from August through December 2008, and was 60 % co-funded by Innovation Norway. The project partners are the National Communications and Research Institute, Bucuresti, Romania and NST. Based on the feasibility study, an application was submitted to Innovation Norway in December 2008 for a full project.

### **3.12 Russia-Norway collaboration**

In northwest Russia, the NST has worked together with health care authorities and other stake-holders to develop telemedicine services and conduct research projects for more than a decade. The Project “The Heart link - e-health contribution to life quality for people with cardiovascular diseases in North-West Russia”<sup>25</sup>, is targeting patients with cardiovascular disorders (arterial hypertension, congenital heart defect), and health workers, especially in rural districts and in primary healthcare. The project will contribute to the development and integration of primary health care and social services. The objective is to create an information service for patients and health care workers in the Arkhangelsk region on prevention and treatment of cardiovascular diseases. This is a joint project with The Regional Centre for medical prevention and The Regional Children’s Hospital both in the city of Arkhangelsk, three local hospitals in the Arkhangelsk region and The Norwegian Organization of Heart and Lung Patient (LHL) and the NST in Norway.

The Archangelsk Regional Clinical Hospital (ARCH) and The University Hospital of Northern Norway (UNN) have a joint project targeting patients with multiple sclerosis and stroke. The main goal of the project is to contribute to establish a department for rehabilitation at the ARCH, in addition to encourage and support interdisciplinary team-work. The project started in January 2006 with financial support from The Norwegian Ministry of Health and Care services, over The Barents Health Programme. E-learning is an important component in the project thanks to well established video-conferencing systems at the main hospitals, and Internet-connection to a total of 25 health care facilities in the region. This telemedicine network for remote consultations and e-learning, has been in operation since 1998.

The NST is supporting various initiatives and collaboration within health service provision and education in the region. Due to the wide use of Russian language, request for telemedicine support and advice come from all over the former Soviet Union.

### **3.13 Telemedicine Training Course for medical doctors in low resource**

#### **settings**

Since 2003, the Institute for Tropical Medicine (ITM), Antwerp, Belgium, has organized an annual Telemedicine workshop on the practical use of the Telemedicine website (second opinion tool) and library document delivery. The main objective is to develop skills and share knowledge necessary for the implementation of Telemedicine/e-health services in resource-limited countries. In collaboration with the NST the telemedicine & e-health workshop was held from 15 through 19 September at the ITM in Antwerp. The joint workshop has adopted a more interactive learning approach, with hands-on sessions on how to develop a Telemedicine/e-health system in low resource settings.

The 2008 workshop was open to external participants: In total, the ITM received 20 applications for participation. In addition to the four students staying after the short course on antiretroviral therapy (SCART), five participants came on an individual basis making a total of nine participants (see Annex 1). Participants’ countries of origin were: Cambodia, Ethiopia, South Africa, Suriname, Sweden, Switzerland, Tanzania, and Uganda. Participants were health technology specialists or medical doctors involved in decision making processes at national or institutional level, planning or already working on Telemedicine/e-health projects in low resource settings.

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<sup>25</sup> [www.zdorovie29.ru](http://www.zdorovie29.ru) checked 5 March 2009



In 2008, we also invited projects leaders of other well known Telemedicine/e-health projects: Raft, iPath and Cell-Life to share their experience with the audience. A session on District Health Information system was lectured via video-conference from the University of Oslo. The training was based on a problem or case approach which the students decided themselves. Exercises were incorporated in the various topics taught, with a final assignment generated by the participants and worked out as a project proposal from three different working-groups.

During the workshop economical feasible ICT solutions and applications in low resource settings were demonstrated and examined: wireless, phone, web applications, videoconferencing and mobile technologies appropriate for Telemedicine and e-health.<sup>26</sup>

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<sup>26</sup> <http://www.telemet.no/telemedicine-training-workshop.4541288-7398.html> checked 12 March 2009

## **4. Collaboration between the centre and WHO**

### **4.1 Visits by WHO staff (headquarters and/or Regional Office) to the Norwegian Centre for Telemedicine**

Dr. Najeeb M. A. Al-Shorbaji, World Health Regional Office for the Eastern Mediterranean (EMRO) visited the NST during the Tromsø Telemedicine and e-health Conference (TTeC), 9-11 June 2008.

Several tele-conference meetings have been organised during 2008.

### **4.2 Visits by the centre staff to WHO (headquarters and/or Regional Office)**

No visits by the centre staff to WHO in 2008.

### **4.3 Use of the centre staff by WHO**

eReadiness missions to the Czech Republic: 21-23 April and 27-28 November 2008

Support to the WHO Global Observatory on preparation of the next survey instrument.

Support to the WHO Global Observatory on e-health European report

Support to the program 'WHO European Ministerial Conference on Health Systems', Tallin Estland 25-27 June 2008.

General advice to WHO on various aspects of telemedicine and e-health.

### **4.4 Support provided by centre staff for courses co-sponsored or organised by WHO (headquarters an/or Regional Office)**

eReadiness assessment to the Czech Republic, 21-23 April 2008 and 27-28 November 2008.

No other co-sponsored activities took place in 2008.

### **4.5 WHO financial support to the centre through contractual or technical services agreement**

WHO has financed the participation of Tove Sørensen in the eReadiness assessment to the Czech Republic, 21-23 April 2008

No other financial contribution has been made in the period.

## **4.6 Collaboration with other WHO collaborating centres**

The NST is interested in more collaboration with other WHO Collaborating Centres.

Request for visiting personnel to the NST from the WHO Collaborating Centre for Emergency and Disaster Medicine Management, The All-Russian Centre for Disaster Medicine "Zaschita", Ministry of Health, Moscow, Russia.

Collaboration initiated with King Faisal Specialist Hospital, Riyadh, Saudi Arabia, which is in the process of becoming a WHO Collaborating Centre.

Professor Maurice Mittlemark, Research Centre for Health Promotion, University of Bergen, Norway (HEMIL-centre), is a member of the Advisory group for European e-health Consumer trends survey. In addition the two centres (HEMIL and NST) are collaborating in research projects and exchange of information and meetings have been arranged.

There is a Memorandum of Understanding between the NST and the Medical Research Council, Telemedicine Lead Program, in South Africa.

## **4.7 Other**

The NST receives visitors from different parts of Norway and from across the world, researchers, policy makers and health managers are mainly interested to know more about telemedicine and e-health in Norway and to learn from the centre's experience and development, but also come to develop future cooperation and new projects. Tromsø Telemedicine and eHealth conference, hosted by the NST 9-11 June in Tromsø, was an excellent arena for networking and discussions of ideas and projects for the future. All in all approximately 200 people have been visiting the NST in 2008, in addition to the 285 delegates from 21 countries at TTeC 2008.

## Annex 1 Proposed workplan 2007-2008

All activities are based on ongoing or planned activities of WHO. No financial support will be provided by WHO to the centre. However, individual arrangements will be discussed and agreed upon separately for joint tasks.

	<b>Activity</b>	<b>Dates / comments</b>
	<b>Support to WHO Regional Office for Europe</b> <b>Support to e-Health activities in 29 BCA countries</b>	2007-2009
	<b>Responsible in WHO/Europe:</b> Angela Dunbar, Gérard Schmets <b>Responsible in Centre:</b> Tove Sørensen	
1.1	Assist in identification of 5 hand-picked European experts to form an advisory board in support of the health systems conference 2008 and associated sub-conferences.  It was decided that the Global Observatory for e-health Thematic working groups are the most appropriate vehicle for this activity.	2007-2008
1.2	Perform feasibility (e-readiness; needs assessment) studies in approx. 2 central or eastern European countries based on already developed feasibility guidelines. Countries to be determined by WHO Euro.  Albania (2007) and Bulgaria (tentative 2008)	Albania (2007) / Bulgaria (tentative 2008)
1.3	Compile examples of 'proven practice' within the 4 functions of the health system. (primarily Central or Eastern Europe) Examples should be 1-2 pages each, 1-2 examples per function in the first phase. Essentially these proven practice examples will be used by internal technical units, and then will be a basis for the HS conference 2008 if necessary.  - identify requirements of what is a 'proven practice'  - report on e-health use for resource generation (e-learning for health professionals)  - report on e-health use for service provision (connecting primary care with secondary and tertiary care, home care provision, e-prescription)  - report on e-health use for stewardship (health information systems at national level, surveillance, medicine monitoring)  - report on e-health for financing (financial pooling, telemedicine reimbursement, health cards)	2006- e-health training in CPH done
1.4	Coordinate mechanisms for interface with technical units such as HIV/AIDS, TUB, and malaria with using WHO collaboration with partners.	2007- SAFE

