PrimCareIT

Report on fully implemented tele-consultation infrastructure and running processes in the pilot sites

Output No. 4.4

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Baltic Sea Region Programme 2007-2013

Table of contents

Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Baltic Sea Region Programme 2007-2013

Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Baltic Sea Region Programme 2007-2013

Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Baltic Sea Region Programme 2007-2013

1. List of Figures

2. List of Tables

3. List of Abbreviations

BelMAPO - Belarusian Medical Academy of Post-Graduate Education
BSR - Baltic Sea Region
HER - electronic health record
ESFD - Estonian Society of Family Doctors
GP - General Practitioner
KPHCD - Kauhava Primary Health Care District
LUHS - Lithuanian University of Health Sciences
OCRH - Ostrovets Central Regional Hospital
PHC - Primary health care
PHCW - Primary health care workers
SEAMK - Seinäjoki University of Applied Sciences
SOHCD - South Ostrobothnia Health Care District
TC - Tele-consultation
VUHSK - Vilnius University Hospital Santariškių Klinikos
WP - Work-package

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Baltic Sea Region Programme 2007-2013

4. Abstract

The Baltic Sea Region (BSR) is confronted with an ageing population, which leads to a rising demand for primary health care (PHC) services. Moreover an increasing lack of health workers and medical doctors challenges the maintenance of PHC within the BSR. Above all the brain drain of health professionals is affecting particularly remote areas in the whole BSR. There is evidence that professional isolation is a leading cause for this brain drain.

The overall aim of PrimCareIT is to raise the attractiveness of remote primary health care for medical professionals by the means of tele-consultation and tele-mentoring. Thereby the project counteracts brain drain and professional isolation in sparsely populated areas for more equal access to primary health care in the BSR.

A better deployment of tele-consultation and tele-mentoring including social media has strong potential to reduce professional isolation and to provide opportunities for professional networking, continuing medical education and career development for younger and experienced doctors and health workers in remote areas.

The current output “Report on fully implemented tele-consultation infrastructure and running processes in the pilot sites” completes pilot projects on tele-consultation. The evaluation of the seven pilots implemented in 2013 is reported. All pilots measured attitude and experience changes turning the tele-consultation sessions. Information was collected in each participating organisation by a questionnaire and an interview. Pilots worked together in close cooperation and learned from the experiences of each other.

Pilots reported that tele-consultation helped to improve professional capabilities in remote areas. Participants felt less isolated and the self-confidence of making decisions and solving cases improved. Timeliness of response was positive and reduces travel needed (both patient and PHCW), possibly reducing costs.

Tele-consultation as a tool for counteracting brain drain was not seen specifically in the study but would be helpful tool for young medical personnel to work in the rural areas and still have access to peer network.

Tele-consultation is a modern approach and good tool to develop professional experience for medical specialists, improving especially younger specialists’ capability to learn and stay empowered in the physical absence of more experienced peers.

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Baltic Sea Region Programme 2007-2013

5. Context and background

The project PrimCareIT is structured in work-packages (WP). The WP 4 had to explore how to overcome professional isolation in the primary health care sector in remote areas. This was to be achieved by elaborating, implementing and testing methods and tools that support tele-consultation. The aims of the WP members were:

- To implement successfully methods and tools for tele-consultation in 7 pilot sites in remote areas of 5 different countries within the Baltic Sea Region.
- To validate the transnationally developed tele-consultation solutions in remote primary care in pilot sites.
- To prepare the durability and large scale implementation of the piloted solutions in the partner regions.

Sub-objectives were:

- To enhance the connection of health professionals within primary health care and the cooperation with the secondary health care sector.
- To enhance the use of ICT for collaboration of health professionals within primary health care and the cooperation with the secondary health care sector
- To improve the professional cooperation and quality in remote primary care.
- To counteract professional isolation through tele-consultation.

Baseline on tele-consultation

Tele-consultation accounts for a substantial part of tele-medicine. It can be generally defined as a (audio-) visual communication link between health professionals. Tele-consultation enables the virtual communication between doctors of different disciplines or with specialists in other health care institutions like hospitals.

As more and more other health professionals in PHC (for example specialised nurses and physiotherapists) have their own consultations and the request for inter-professional collaboration, there is a need for technical and methodological support for communication and consultations between all health professionals in PHC.

Tele-consultation is carried out in different ways. There are two broad categories: live tele-consultations via video- and audio recordings and data tele-consultations. Video- and audio recordings can be uni- or bi-directional, in real-time or not. The information can be transmitted via e-mails, the World Wide Web and through other Internet applications. Data tele-consultations involve the information regarding the patient's medical condition, for example laboratory findings, which is forwarded to a consulting physician for second opinion.

The use of social media has increased rapidly in healthcare during the last decade.

Physicians, patients, and healthcare organisations are all starting to employ a new generation of online and mobile technologies, which are fundamentally changing the way healthcare works. Social media, for example, can be used by healthcare providers to give general advice, provide information, and to facilitate interaction between patients and physicians or nurses. Social media also represent an untapped means for social networking among medical professionals. For example, social networks can be used to reduce the isolation of remote primary care physicians or to improve the means for addressing support to tele-consultation is also considered in the demonstration scenario as a possible component.

Especially in remote areas tele-consultation can take place between health workers and general

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Baltic Sea Region Programme 2007-2013

practitioners (GPs) as well as between GPs and medical specialists at hospitals. During a home visit by a health care worker, for example, the patient information on vital signs, pictures of ulcers or recordings of the patient's behaviour after suffering a stroke can be sent via mobile phone directly to the GP, who can give further instructions to the health care worker. Thus, the patient does not have to travel to the GP. According to this example, tele-consultations will also facilitate the shift of medical tasks from hospitals to GPs and from GPs to health workers. Consequently, specialists are taken to the primary health care sector by tele-consulting. Therefore, tele-consultations ensure continuous care. Moreover, hospital visits will be reduced.

Technologies for tele-consultation are available off-the-shelf. However, there are several obstacles and problems that prevent the implementation and routine use of tele-consultation. A survey of the project participating Baltic Sea countries on challenges for implementation of tele-consultation in remote primary care showed that a reserved attitude of health workers and GPs towards eHealth and tele-consultation inhibit its use. Until now, tele-consultations are not part of daily working routines of GPs and health workers. There are no processes implemented, on which level a tele-consultation should take place. Furthermore, a missing reimbursement scheme of tele-consultation between institutions of primary and secondary health care makes an implementation and use of tele-consultation difficult.

For tele-consultation the national frameworks concerning the health care system, existing connections between health care provides as well as data protection and legal security have to be taken into account. Legal uncertainties regarding tele-consultations and documentation of health data should be clarified. The applications should be feasible and manageable.

Still, tele-consultation is proven to be one instrument to counteract professional isolation of GPs. It allows them to directly communicate with a colleague to discuss clinical pictures, diagnosis and treatment of their patients. Therefore, tele-consultation is also a tool for continuing education.

Furthermore, tele-consultation leads to better cost-effectiveness, cost savings, access to specialised medical knowledge and to more attractive jobs for medical professionals in remote area.

PrimCareIT addresses the aforementioned problems and will solve them in consideration of the national and regional distinctions. Seven pilot sites in five different countries within the Baltic Sea Region – Finland, Sweden, Lithuania, Estonia, and Republic of Belarus – will elaborate, implement and test tele-consultation within this project.

In most of the participating pilot regions, a secure environment for eHealth applications in primary health care is already established. In Estonia, for example, tele-consultation should be made through secure environment of the electronic health record (EHR) system. But even though the infrastructure is at hand, eHealth for consultation has not yet been introduced in remote primary care. All implementing project partners are facing resistance in the use of eHealth applications such as tele-consultations. These obstacles and barriers should be overcome by PrimCareIT.

The use of tele-consultation in remote areas is a new promising field of improving primary health care. The tele-consultations should take place both within regions and across borders to meet the transnational aspect. Regarding WP4 of the flagship project ImPrim, which developed measures to enhance and harmonise professional development in primary health care, this work package should establish tele-consultation as the aforementioned tool for continuing education in remote primary care and improve the cooperation between health professionals within the primary health care sector, for example between nurse and GP, as well as with the secondary health care sector.

A transnational workshop will evaluate its results. A handbook with good practices and guidelines for the successful implementation and usage of tele-consultation will be published.

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Baltic Sea Region Programme 2007-2013

6. Methods

The main influence for designing the individual pilot studies in this work has been case studies[1], which provided a useful baseline because the area of concern has been in a contemporary live healthcare process that cannot be lifted out of its context and where the events cannot be controlled. Yin states that a case study is *"...an empirical study that investigates a contemporary phenomenon within its real-life context"*[1](p13). A case study approach is applicable, especially when the boundaries between the phenomenon being studied and its context are unclear. This matches the reality in the pilot cases with their rather uncontrolled interactions. For instance, it is difficult to replicate a healthcare-to-healthcare consultation without the access to the actual situation including possible stress or impact of patient presence, making it hard to mimic or replicate the consultation. Further, because the project is about understanding "how" the practical tele-consultation can be supported, and carried out, the case study approach is also appropriate.

The participants of WP4 have been asked to use templates for pilot descriptions for each pilot (PrimCareIT-WP4-PilotX-Name.docx), in order to collect data to plan and carry out the studies.

7. Reports on implemented tele-consultation pilot sites

Present chapter reports on implementation of tele-consultation pilots: context, technology and running processes in the pilot sites.

There are seven WP4 pilots planned according to Figure 1.

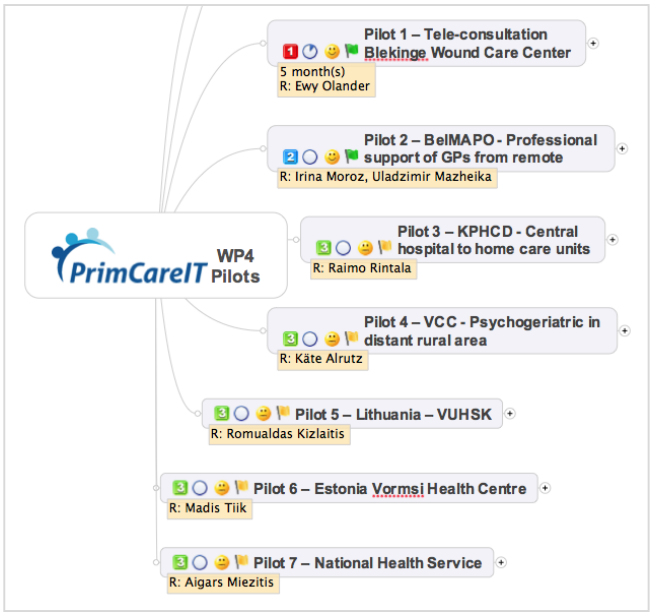

Figure 1. WP4 pilots (Source: Riga PrimCareIT WP4 meeting documentation).

#1 Sweden: Blekinge Wound Care Centre and primary care actors (Municipality and County Councils)

[1]Yin, R.K. (2003) Case Study Research - Design and Methods, Newbury Park, Sage.

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Baltic Sea Region Programme 2007-2013

#2 Belarus: State Educational Institution Belarusian Medical Academy of Post-Graduate Education – Professional support of general practitioners from remote areas.

#3 Finland: Kauhava Primary Health Care District – Central hospital to home care units

#4 Sweden: County Council of Västerbotten – Psychogeriatric in distant rural area

#5 Lithuania: Vilnius University Hospital Santariškių Klinikos – Remote general practitioner

#6 Estonia: Estonia Vormsi Primary Health Care Centre – general practitioner support

#7 Latvia: National Health Service – Supporting general practitioners from remote areas

The pilots are described in full in Output 4.2.

7.1. Pilot deployment scheme

As seen in Figure 2 the deployments of all pilots started as of Jan 1 2013. There were mid-term evaluations according to WP4 directions, and final documentation by end 2013.

Pilot	2012 Oct	2012 Nov	2012 Dec	2013 Jan	2013 Feb	2013 Mar	2013 Apr	2013 May	2013 Jun	2013 Jul	2013 Aug	2013 Sep	2013 Oct	2013 Nov	2013 Dec
#1						Eval 1									Final
#2								Eval 1							Final
#3							Eval 1								Final
#4						Eval 1									Final
#5								Eval 1							Final
#6									Eval 1						Final
#7							Eval 1								Final

Figure 2. Deployment plan of pilots #1-7.

8. Status and evaluation of pilots

Following the intentional plan for evaluation pilots have responded using a decided predefined format regarding evaluation.

8.1 Pilot 1: Tele-consultation between Blekinge Wound Centre and primary care actors (Municipality and County Councils)

Contact person: Ewy Olander, Blekinge Institute of Technology, Sweden

8.1.1. Background

This pilot was implemented in Blekinge, Sweden. Blekinge is a small county in south east of Sweden with 152000 inhabitants in five municipalities. Blekinge County Council is like all county councils in Sweden, a democratically controlled organisation. The Blekinge county council has the responsibility for health care services in the county, except health care in home and elderly care.

The PHC - The five municipalities are responsible for these activities. Context for the tele-consultation pilot, was the Blekinge Wound Centre (Blekinge WC) and the Primary Health Care (PHC) in Blekinge County Council.

Blekinge WC is a unit of the PHC, specialised on treatment of slow-healing wounds. The WC is manned by one Wound specialist General Practitioner (GP), one registered nurse and two nurse

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Baltic Sea Region Programme 2007-2013

assistants, all specialist to wound treatment. Blekinge WC has consultation receptions, one in the eastern part of Blekinge and one in the western part. New patients visit the WC for a first doctor consultation with assess of the wound and to get guidelines for treatment, dressing etc. Thereafter should the wound treatment be provided by nurse /nurse assistants in PHC, Home Care or Elderly Care, or when necessary, by WC-nurse/nurse assistants. As it worked out before the pilot, the nurses/nurse assistants in PHC, Home Care and Elderly Care could get telephone support from the WC nurses/nurse assistants. When needed, patients and health personnel had to travel to the Wound centre for assessment or treatment consultations.

At each PHC-centre it is often one or two PHC nurses/nurse assistants, who take responsibility for the treatment of patients with wounds. There are not so many patients with wounds in each PHC-area, to keep competence for a high quality in wound assessment, treatment, dressing and caring. GP´s in PHC often don't have knowledge in wound treatment to supervise the wound nurses/wound assistants. Due to this there is need of specialised knowledge and guiding from wound expert personnel. To improve nurses and nurse assistants competences in wound treatment and dressing, Blekinge WC yearly organises "wound schools" for nurses and nurse assistants. Tele-consultations could be a way to improve telephone support, PHC- nurses/nurse assistants' competence, and replace or complement consultations at the Wound Centre.

8.1.2. Purpose and objectives

The purpose with the pilot project was to find out and test best arrangements, structures, equipment, etc. for Wound centres tele-support and consultations that also could support collaborative learning, improve professionals' competence and counteract professional isolation and brain drain.

The objectives were to find out

- how the tested technical equipment support tele-consultation with sharing photos, recording consultations and several participants involved;
- the technical equipment´s usability;
- the possibilities for tele-consultation using mobile connections (3G) in rural areas;
- tele-consultation impact on participating health personnel knowledge, understanding and skills for high quality of professional and secure investigation, treatment and caring;
- which changes are needed at the Wound centres and the health care units to implement tele-consultation.

8.1.3. Timeline

The pilot started in September 2012 and was planned to continue to June 2013. Due to delays in access and installation of software, the pilot continued to December 2013 and included more sessions than originally planned.

8.1.4. Participants

In the pilot participated:

Blekinge County Council

Blekinge WC; Two nurse assistants, one at each Wound centre, took the active part in the pilot and provided the tests and consultations. They have most of the contacts and consultations concerning wound treatment and dressing with health care personnel in PHC, homecare and elderly care, supported by the wound specialist GP and nurse. The WC -team participated in the pilot planning,

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Baltic Sea Region Programme 2007-2013

discussions and evaluations.

Five PHC centres; Ronneby, Nättraby, Kallinge, Mörrum och Sölvesborg, and eight PHC wound nurses/nurse assistants participated in the tele-consultation tests. They got involved in the Pilot from a pragmatic way of sample. The nurses/nurse assistants took care of patients with wounds and had contact with the WC-nurse assistants for support and consultations. Each PHC-nurse/nurse assistant was asked to take part in the pilot by the consulted WC-nurse assistants. They were informed on the project, aims and how the tele-consultation would be conducted, and asked to participate with information consent.

The PHC-centres managers were informed on the project and agreed to the pilot and nurse/nurse assistants' involvement.

IT-department: One IT-technicians supported installation and access to the software as Lync and Logitech web camera and support with Lync communication problems.

Blekinge Competence Centre (BCC); One project manager for a ICT-project testing application to ICT-solutions in Health Care, facilitated with experience from tests of Lync video communication system. An IT-manager also involved in the ICT-project facilitated the use of Lync and to find solutions when there were problems with Lync connection.

Blekinge Institute of Technology (BTH)

One pilot leader with continuous contacts and discussions with the WC- nurse assistants for planning follow-ups and evaluations. The pilot leader also met the participating PHC-nurses/nurse assistants at the PHC centres and introduced the pilot and Lync, supported and did follow ups.

One ICT-educator investigated the need of equipment and supported the use of the Lync communication system and the web camera in collaboration with the pilot leader.

8.1.5. Tele-consultation modes (types of sessions)

Four types of Lync video-communication modes were planned for the tele- consultation pilot.

- Type A – tele-consultation with a dialogue between the WC nurse assistants and the PHC nurses/nurse assistants.
- Type B – tele-consultation based on a photo of the actual wound taken by the PHC-wound nurses and placed on the desktop using the Lync function "Share".
- Type C - tele-consultation during a patient consultation at the PHC using web-camera to show the wound for the WC nurse assistant.
- Type D – tele-consultation with another PHC nurse as a listener and learner (collegial tutoring).
- Type E - tele-consultation between WC Expert Wound –nurse and a Home care nurse visiting a patient with a wound in the patient´s home.

The consultations were not arranged especially for the PrimCareIT, they took part when the PHC-nurses felt need for WC-support and consultation, but were logged in template when they occurred. The nurses and nurse assistants at the PHC contacted the WP-nurse assistants when needed and tested tele-consultations instead of a telephone consultation or a patient consultation at the Wound Centre.

A tele-consultation could be planned and booked with the WC nurse assistant in advance. A tele-consultation could also be unplanned, due to an urgent need of support and taking the opportunity to

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Baltic Sea Region Programme 2007-2013

get a consultation while the patient is at PHC, if this is possible for the WC-nurse assistant.

8.1.6. Number of consultations

In the pilot totally 48 consultations were conducted.

- Type A – tele-consultation with only a dialogue.
  - 7 reported consultations (probably many more).
  - Used for simply questions and booking.
- Type B – 11 reported consultations.
  - Used for consultation of difficult assessment, treatment.
- Type C - 18 reported consultations.
  - Used for consultation of complex treatment, dressing, hands-on supervision, dialogue with the patient
- Type D – 4 reported sessions.
  - Used for training of new “wound”-nurses and students in PHC.
- Type E – 0 reported sessions.
  - This mode of consultation had to be excluded from the pilot due to lack of external Lync connections between Blekinge county council and the municipalities.

8.1.7 Technology

Following technologies were used

- Computers with wired internet connection.
- Lync Attendee 2010 video conferencing system.
- Logitech camera.
- Web cameras and extension cords with or without tripods.
- Laptops with VPN connection.
- Tablets (Apple iPad) with mobile/cellular connection.
- Wi-Fi and mobile roaming access provided via 3G networks and local LAN, purchased on monthly subscriptions.

8.1.8. Evaluation methods

Questionnaire/protocol

A questionnaire/protocol for documentation and evaluation of each tele-consultation was developed by the WC nurse assistants, the BCC ICT-support and the pilot leader. The evaluation included questions on technology, process and outcomes, and experiences and satisfaction. The questionnaire/protocol was filled in by the WC nurse assistants.

Interviews with the WP-nurse assistants

The evaluation of the pilot process and outcomes was conducted by the pilot leader as a group interview with the two WC-nurse assistants. The WP4 protocol was used as an interview guide for

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Baltic Sea Region Programme 2007-2013

more in depth reflections on experiences and suggestions for improvements.

Interviews with PHC-nurses/nurse assistants

Interviews were conducted by the pilot leader with seven of the eight PHC-nurses/nurse assistants. An interview guide was used consisting of questions on experiences of the used technology in the tele-consultations; communication via Lync and web camera; contributions with tele-consultations.

Field notes

Field notes were written by the pilot leader from informal conversations and interview, and observations when the tele-consultations were introduced at the PHC centres and other contacts with the PHC nurses to catch feelings and perceptions on tele-consultation, but also conditions and factors influencing use of technology and communication for consultation.

8.1.9. Technology and technical equipment assessment

Lync conference system

All involved nurses and nurse assistants believed that the videoconference system Lync was easy to understand, use and worked well for the tele-consultations - "*when we got access to the devices*".

The opinion was that it should be easy to start tests with tele-consultations – as Lync and Logitech already was existing software in the Blekinge County Council. Before the PrimCareIT pilot, the Lync system was mostly used by administrators and not in the patient care in the Blekinge County Council. It took therefore time to get access and to solve eventually problems in installations in the actual computers. For each participant in the pilot, the pilot leader had to send a request to the IT department for installation of Lync system and Logitech into the involved PHC-nurses computers, and for access for each person to use Lync and the web-camera. It could take several days. Some of the county council computers were old and had no web-camera installed, other computers had no sound unit which prompted several contacts with the IT department-support. Due to lack of allocated pilot time, the IT department could not give needed support to the PHC- nurses. This caused delayed and diminished number of test-consultations.

Web-cameras and extension cords.

To take a picture or videotape a wound on a leg, a feet or in the back, it is not enough with the web-camera in the computer. There is need for a separate web-camera and an extension cord to come close to the wound and get a sharp picture of the wound. At two PHC centre they also tested to have the camera on a pod, which was especially valuable to keep the web-camera still when showing the wound during a Lync-meeting. Two nurses suggested wireless cameras, to avoid the extension cord.

The WC nurse assistants and the WC medical doctor were satisfied with the quality and sharpness of the photos of the wounds taken with the Logitech camera and shared in Lync on the desktop.

Laptops and tablets with wired and wireless internet connection.

Tele-consultation via Lync with wireless connection gave several problems and did not work satisfactorily. Test with tele-consultations via Lync with laptop and VPN did not work due to the Blekinge County Council security system. Test using laptop in rural areas and tablets with wireless internet connection did not work properly. It was not stable enough. The image and sound got "frozen", due to weaknesses in the mobile operator's coverage.

8.1.10. Need of time/support/development regarding equipment

In the pilot there was need for different kind of support. First a support was needed to get access to

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Baltic Sea Region Programme 2007-2013

Lync in the actual computers at the participated PHC-centres. Then there was need of support to find out problems when Lync or network connection did not work. This could only be fixed by a County Council IT department support who knows the County council IT-system, permissions, computers firewalls etc. The BCC manager made a simple Lync manual with “screenshots“ as help for use of Lync. But this was not enough. The participants wanted more instructive manuals, as it could be a month between the need of consultations.

8.1.11. Communication assessment

Type A.

The tele-consultation worked well and the benefit comparing to a common telephone- consultation was the possibility to use and read the body language. Both WC and PHC nurses/nurse assistants expired Lync as an easy mode to get contact. The Lync icon on the computer screen shows when the WC-nurse assistant is active at the computer and if so, it is easy for the PHC-nurse/nurse assistants to send a request for consultation in a chat-room or as a call. The WC-nurse assistant could answer in the chat room or change the available sign to be not available or available in 20 minutes etc.

Type B.

This mode of tele-consultation based on a photo of the actual wound was a valuable supplement to the telephone consultation and worked well. The possibility for both WC- and PHC- nurse assistants to look at the wound on the shared desktop during the consultation gave better basis for discussion and decisions on treatment, and thereby higher quality and secure treatment.

This type of tele-consultation could substitute a travel to the Blekinge WC or to the patient´s home for a consultation.

Type C.

This mode of tele-consultation during a patient consultation at the PHC was expired as a very valuable development of consultation modes. During the consultation, the PHC-nurse/nurse assistant used a web-camera with an extension cord, hold by hand or placed on a tripod. They first focused the camera on the patient´s face, so the WC-nurse assistant and the patient could get contact and have a small conversation. Thereafter the camera was directed on the wound. This tele-consultation mode also gave opportunity for a dialogue between the WC-nurse assistant and the patient. It worked well when the PHC-nurses/nurse assistants learned the best way to manage the web-camera. They considered small changes in the consultation rooms and the location of the computers and cameras. The PHC-nurses/nurse assistants expired this mode of tele- consultations as very valuable for improvement of treatment and dressing quality and their own competence and self-efficacy. The patients and the followed relatives appreciated to be present during the consultations and thereby be part of the conversation on the treatment.

Type D.

The nurses who participated in this mode of tele-consultation were pleased and thought that this kind of collegial tutoring could increase the understanding, self-efficacy and quality of wound treatment. This mode of tele-consultation was only used four times, due to lack of time caused by overloaded PHC personnel and no resources or time for “extras” in the organisation.

8.1.12. Need of time/support/development regarding communication

According to the participating nurses/nurse assistants, tele-consultation does not need more time than telephone consultation or physical meeting for consultation, except the time for explanation and guiding Lync the first consultations, and time for preparation taking a photo of the wound or arrange

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Baltic Sea Region Programme 2007-2013

for use of web-camera. Thus, tele-consultation needs County Council IT support, familiar with the Lync system, and County Council adapted user-friendly manual for use of Lync, web-camera and sharing photos. Practice in real situations that give skills and self-efficacy.

8.1.13. Pilot participants perspective

Wound Centre personnel experiences and attitudes

Blekinge WC personnel were positive to tele-consultation and considered the new modes of consultations as valuable complements to physical consultations at Blekinge WC and to ordinary telephone consultations and e-mail contacts. They believed that this kind of tele-consultation with mentoring and education could give a higher competence and interest in wound treatment and thereby higher quality of the PHC-consultations. The WC-nurse assistants considered several benefits of tele communication; faster and easier access to the wound centres, increased quality and security in their wound assessments and discussions with the PHC-nurses, more secure treatment. The lack of external Lync excluded communication with municipalities – home care and elderly care; The WC-personnel consider tele-consultation with these as very important and beneficial. In home care and elderly care there are several vulnerable patients with wounds and travel to a WC could be very troublesome. Additionally, there is lack of knowledge in wound treatment among the personnel that could be improved by tele-consultations with mentoring.

PHC-personnel experiences and attitudes

All the PHC-nurses/nurse assistants who tested Lync for tele-consultation with wired connection were satisfied with the easy technique, good quality of communication and sharing photos, and the possibility to use it during patient visits at the PHC-centre. They believed that the tele-consultation sessions with educational discussions could give a higher quality of their wound treatment, improve collegial dialogues leading to higher working satisfaction.

They also thought that tele-consultations can reduce the number of travels to the Blekinge WC for consultation. It spares money and time but also reduces patient suffering, as travelling can be problematic for patient with ulcer.

Both PHC managers and nurses/nurse assistants considered several benefits of tele communication; faster and easier access to experts, increased quality in assessments of wounds, more secure treatment, but also more considered and eventually fewer Blekinge WC-consultations. Patients who took part in tele-consultations during a PHC-consultation were very satisfied with the method and the dialogue with the WC- nurse assistants.

8.1.14. Organisational perspective

Filed notes, protocols and interviews show that the participating personnel are not talking about supporting organisational factors for tele-consultations as separate factors. They talk about factors influencing tele-consultations and these were often limiting but could in an opposite way be supportive.

8.1.15. Supportive and limiting factors

The PHC-managers positive attitudes to take part in the tele-consultation project were very supportive for the pilot. It opened for meetings and invitations to the PHC-personnel and facilitated them to be participants in the pilot. But, the PHC organisations are very tight and the personnel are hard work loaded. There are no time for “extras” which also limited the time for collaborative learning sessions and project meetings with development reflections.

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The County council IT department is an important organisational factor and actor that can support or limit tests and use of new technology as tele-consultation. IT- policy documents can facilitate this, but lack of such policy documents can limit or hinder tests and use. This seems as a paradox, there is need for policy documents, but formulation of policy documents need tests and "evidence". In the county council there were no policies for installation, access and use of Lync. We had to write a request for each participating PHC-nurse/nurse assistant which caused delays and limited number of tele-consultations. It is also the IT department who decide what kind of computer, software and other devise the personnel need and if there is no agreement on this between the IT-department and the PHC this could limit the possibility for the PHC-nurses to test different devices.

8.1.16. Financial perspective (travelling/ time)

Both WC- and PHC- personnel point out financial aspects, both in short term and long term, as arguments for implementation of tele-consultations. They explain short time cost saving from three perspectives; WC-personnel, PHC- and Home Care personnel and patient perspective. From a WC-personnel perspective, using tele-consultation instead of travelling to patient´s home when the patient is immobile to go to the Wound centre or PHC-centre saves working time and travel costs. From a PHC-personnel perspective, using tele-consultation instead of travelling to the wound centre with the patient saves working time and travel costs. From a patient perspective using tele-consultation instead of travelling to the wound centre, saves also time and travel costs for the patient. In a long term perspective the WC- and PHC- personnel could see that tele-consultation can give cost savings regarding to easy access to expertise and by that fewer but more adequate PHC-consultations and wound treatment, and by this lower PHC costs.

Compared to a situation in which the PHC-nurse assistant would be travelling to the Wound Centre, or the Wound Centre nurse assistant to the PHC centre the save of the costs in the 10 pilot sessions:

- save of time of travelling: 6,9 hours x 27 € salary/hour = 186,3 €/ per person
- save of costs of travelling: 57 kilometres x 10 pilot sessions x travel cost per kilometres 0,37€ = 211 €/ per person
- Totally for 10 consultations = 397,1 €

The numbers are figurative and probably more savings occur on patient side and also in scheduling ease.

8.1.17. Tele-consultation potential effects

Professional isolation

The Lync videoconference system gave the PHC-nurses/nurse assistants a new easy way for communication with the wound care specialists especially WC-nurse assistants and other PHC-nurses/nurse assistants working with wounds. Lync was not only used for patient centred specific consultations, it was also used for more common wound treatment consultations and discussions. In this way tele-consultation could reduce the feeling of professional isolation and increase the active involvement in wound treatment development through contribution of treatment experiences and reflections on existing treatment methods and stuff.

Staff expertise

The tele- consultations in the pilot were carried out as learning sessions aiming to increase the PHC-nurses/nurse assistants understanding on wound treatments. The PHC-nurses/nurse assistants explained that the tele-consultations were very instructive and that they already had got both new

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knowledge and skills. Hence, tele-consultations can facilitate a higher competence in wound treatment among the PHC-wound responsible personnel.

Knowledge exchange

In Blekinge County Council PHC, it is often one or two nurses/nurse assistants, with more or less knowledge in wound treatment, who take responsibility for the treatment of patients with wounds. Medical doctors in PHC are not often educated in practical wound treatment and could not give the wound nurses support. Through the tele-consultations the PHC-nurses/nurse assistants increase their competences. They can feel rather alone and need a forum for knowledge exchange. The WC personnel have already access to some education on a Wound-web-page, but they suggest a more interactive page for networking and knowledge exchange as a further development of the tele-consultation development.

8.1.18. Conclusion

SWOT-analysis

Reflections on Strengths, Weaknesses, Opportunities and Threats of tele-consultation expired in the pilot, composed from the interviews and field notes to a SWOT-analysis.

- Strengths
  - treatment security
  - time saving
  - make the work interesting and fun
  - continuous learning
  - support correct decisions
  - quicker consultations
  - easy access to experts
- Weaknesses
  - geographical shortage Wi-Fi-connections tablets -Lync comparability
  - lack of manual for Lync and web-camera use
  - short of advertisement of project and tele-consultations benefits
  - shortage of IT department involvement
  - lack of IT-support routines
  - home care not included due to IT system
- Opportunities
  - modernisation of methods
  - managers and nurses are interested in improvement of their work
  - video-technique opens for new communication modes
  - gives cost savings without decreased quality
  - easy way to follow care processes
- Threats
  - worry for technical problems
  - lack of video meeting competence
  - lack of economical recourses
  - traditional organisational routines
  - limitations in installation of and access to software

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8.1.19. Lessons learned

The lessons learned reflect the experiences from the pilot project process, from planning phase to outcomes on what worked and how this could be supported and what did not work and how this could be improved. The lessons learned focused on need of collaboration, functioning devices, end-users involvement, and grounding for implementation.

To get a good quality support for tele-consultation, installation, access and use, the actual health care IT department should be involved in the project as an active responsible part from the beginning with agreements and routines for support.

To get good conditions for testing – tele-consultation during the project, find out and solve devices problems as soon as possible although they are outside the project, as they hinder tests and sessions and in this way influence on the project progress.

To get user-friendly solutions, involve the health personnel as active participants in the development process with follow ups of their needs and suggestions for improvements. Health care personnel, managers as well as nurses and nurse assistants are very positive to use new technical methods and solutions, when they understand the benefits and how to handle the new devises.

Implementation of devices for tele-consultation in ordinary work needs routines and templates for installation and access and Lync educated IT-support. Contact and inform actual health care politicians and managers early in the project to get fundamentals and openings for further implementation discussions.

8.1.20. Maintenance and further development of ICT in PHC

Actions for sustainability of pilot

During the pilot project, implementation of tele-consultation in ordinary work was discussed with PHC- and WC- personnel. They are very positive to implementation and perceive this as a natural development according to overall increased ICT use. They are aware of that a step from a small-scale pilot to implementation for large-scale solutions needs different actions for maintenance and confidence. The PHC-personnel consider the need of an implementation discussion in an early stage, with highlighting of different aspects; standard of computers and devises, IT-support, tele-consultation competence, documentation, security, etc. The WC-personnel are also aware that an implementation of tele-consultation with many more tele-consultations, demands consideration of several aspects such as access to and time for planned and unplanned tele-consultation, routines, documentation, security, and changes in current consultation planning and routines for contacts to become sustainable. One PHC-nurse suggested a web-based booking system.

8.1.21. Future

Along with the development of ICT use in health care, tele-consultation most probably will be an ordinary method for consultations in PHC in the future. Such mode of consultation between health professionals within PHC and with relevant specialist in secondary care can reduce professional isolation, provide opportunities for professional networking and support continuing learning, and thereby improve competences and attracting more medical professionals to remote areas.

This tele-consultation project is performed in the county council health care. The WC- personnel notice an increased number of patients with slow healing wounds in the municipality responsible home care. Due to organisational changes there has been “brain drain” of wound treatment competence and now there is need of tele-consultation with education and collegial support

Thus, tele-consultation cannot survive as a “separate” ICT solution, it needs an ICT supporting

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environment.

The PrimCareIT tele-consultation project is one of several projects in Blekinge County council focusing on application of ICT solutions in Health care. Each of them contributes with experiences, specific for the tested solutions, but also more general on implementation, use, reliance and sustainability of new ICT-based health care solutions. To shape an ICT supportive environment, all these experiences and contextual knowledge must be taken into account in a comprehensive county council ICT implementation strategy evolved in collaboration with the users

8.2 Pilot 2: BelMAPO - Professional support of doctors (general practitioners) from remote areas using tele-consultations

Contact person: Maksim Makouski, State Educational Institution Belarusian Medical Academy of Post-Graduate Education, Belarus

8.2.1. Background

Tele-consultations were carried out between specialists of BelMAPO and PHC (Primary Health Care) specialists of OCRH and 4 hospital-based outpatient clinics affiliated to it, which are located in rural areas and considered to be professionally isolated.

OCRH and 4 hospital-based outpatient clinics affiliated to it are at least more than 140 km away from BelMAPO (Minsk). Distance from BelMAPO to The Ostrovets Central Regional Hospital (OCRH) is also about 140 km, to HBOC Kimelishki – 182 km, to HBOC Mikhalishki – 175 km, to HBOC Gervyaty – 170 km, to HBOC Voroniany - 168 km. Pilot #1 participants are BelMAPO with General Medical Practice and Public Health and Healthcare departments and OCRH with 70 doctors in 21 specialties and 4 hospital-based outpatient clinics affiliated to it (8 GPs).

8.2.2. Purpose and objectives

The main aim of the pilot is to support PHC specialists in remote areas via ICT (tele-consultations and tele-mentoring).

Pilot goals:

1. To raise the professional level of PHC specialists in rural areas via e-learning and tele-consultations
2. To decrease professional isolation via ICT
3. To develop international collaboration on tele-mentoring and tele-consultations in medicine with the Baltic Sea countries (experience exchange, seminars)

During the project we managed the following:

- The pilot participants were equipped with the required technologies to carry out tele-consultations between BelMAPO and PHC (Primary Health Care) specialists of OCRH and 4 hospital-based outpatient clinics affiliated to it
- Both sides gained the experience in conducting tele-consultations via e-learning technologies (on-line/ off-line, Skype, e-mail and etc.).
- Healthcare specialists got the opportunity to broaden communicational network.

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8.2.3. Timeline

The pilot started in December 2012. The implementation of the pilot was carried out step by step. The more active implementation on tele-consultations started in September 2013, when we improved the technologies in pilot sites, see Table 1.

Table 1. Project procedures and milestones, Pilot 2, WP4

Steps	Timing	Status
Technical equipment	(February 2013)	Finalised (using own technical resources)
Adaptation	(February 2013 – June 2013)	Finalised
Mid-term evaluation	(June 2013)	Finalised
Implementation	(June 2013 – October 2013)	Finalised
Estimating the efficiency	(November 2013)	Finalised

8.2.4. Participants

Tele-consultations were carried out between specialists of BelMAPO and PHC (Primary Health Care) specialists of OCRH and 4 hospital-based outpatient clinics affiliated to it.

Tele-consultations were carried out on the following directions (Figure 3):

- between a specialist of BelMAPO and PHC (Primary Health Care) specialist of OCRH and 4 hospital-based outpatient clinics affiliated);
- Tele-consultations between GPs
- Tele-consultations between GPs and specialists of OCRH

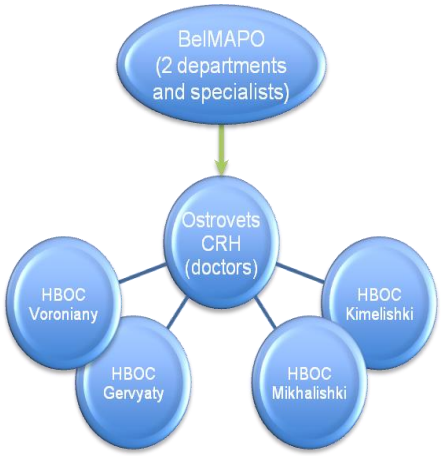

Figure 3. Participants of the pilot

Tele-consultation between the consultant of BelMAPO and PHC (Primary Health Care) specialist (Ostrovets Central Regional Hospital, 4 hospital-based outpatient clinics affiliated to Ostrovets CRH) were carried out in the following way:

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- Consultation and communication via video conference system using computers with web cameras.
- PHC specialist sends photo/medical data of a disputable case to the BelMAPO consultant by e-mail.
    - Documentation (to assess the quality of tele-consultation specialists filled in the questionnaires)

There were the following fields covered by tele-consultations: neurology, cardiology, paediatrics, surgery, phthisiology, pulmonology, oncology, endocrinology, otolaryngology, clinical and laboratory diagnostics, ECG (on-line/off-line, using e-mail, Skype, telephony).

To participate in the tele-consultation OCRH and 4 outpatient clinics' specialists were required to proceed registration and filling-in the application at BelMAPO web-site "BelMAPO and OCRH tele-consultations".

8.2.5. Evaluation methods

To assess the results of the tele-consultation pilot implementation we used the following methods:

Questionnaire

- questioning of each participant before, during and after the implementation of the tele-consultation pilot
- the assessment of each tele-session by the participants
- the assessment of the experts' opinion about the tele-consultation implementation

Interview

- Individual interviews of BelMAPO and OCRH specialists

8.2.6. Tele-consultations framework

While implementing the pilot on tele-consultations we used various types of IT (Table 2).

Table 2. Type and number of sessions

Type	**IT**	**Number of sessions**
Type A – tele- consultation in dialogue	Skype, e-mail	50 sessions (43 sessions online and 7 offline)
Type B –tele-consultation, photo (laboratory studies)	e-mail	25 sessions
Type C – ECG (the transfer of ECG data via phone and making record of the results into the electronic history of a patient)	telephony	47 sessions
Total		122 sessions

8.2.7. Technology

The Following technologies have been used:

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- Video conferencing system
- computers with wired internet connection
- web-cameras and extension cords
- laptops with mobile connection
- Wi-Fi and mobile roaming access provided via 3G networks and local LAN, purchased on monthly subscriptions.

The hardware operated with the following programs:

- Oovoo (free of charge) – for communication
- E-doctor – for making electronic records in the history of a patient

8.2.8. Technology and technical equipment assessment

What worked and what didn't and why

The realisation of the project assisted to equip the participants with the required technologies, which further made it possible to succeed in implementation of tele-consultations among the PHC specialists in the remote areas. The equipment and software the participants had used assured the realisation of the PrimCareIT goals (Table 3).

Table 3. The assessment of the tele-consultation pilot

Evaluation Criteria	Pre-testing	Mid-term testing	Post-testing
Satisfaction with technical aspects (%) (How satisfied were you with the functionality of the used technology during the connection?)	50	73	89.3
Satisfaction with technical aspects	2.9	4.1	4.6
Satisfaction with content (%) (How useful do you consider the content of the session was?)	70	75	93
Satisfaction with content	4,0	4.2	4.8
Per cent of the users interested in tele-consultations	100	100	100

8.2.9. Need of time/support/development

During the project implementation we detected the increase in the necessity of it-support staff,

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moreover the Internet requirements had been also raised.

8.2.10. Communication type assessment

In the implementation process of tele-consultations we used various types of telecommunications: Type A – tele-consultations in dialogue, Type B – tele-consultation via photo (laboratory studies), Type C – ECG (forwarding the ECG data via phone to update the e-history of a patient). All the participants marked the types as “good”, depending on the problem to solve. Therefore, in emergency cases with acute illness and traumas the specialists preferred Type A – tele-consultations in dialogue, which were on-line.

8.2.11. Participants perspective

All the interview participants found it important to implement tele-consultations into the healthcare. It will improve the professional level of the specialists, quality of the medical care, reduce professional isolation of PHC specialists in the remote areas.

8.2.12. Organisational perspective

Supporting factors

The main factors of tele-consultation pilot’s implementation were high motivation level and interest of the project participants in using tele-mentoring and tele-consultations in medicine. (Per cent of the interested in tele-consultations = 100%), skilled staff. There was also detected the interest of the specialists who made decisions on the different levels.

Advantages

- High motivation (specialists, politicians)
- Skilled staff

Limiting factors

The participants mentioned the following main obstacles that counteract the implementation of tele-consultations:

- Technical equipment
- Lack of experience in tele-consultations
- Absence of legal acts on tele-consultations in Belarus
- Low quality of telecommunication connection

8.2.13. Financial perspective (travelling/time)

The analyses of financial costs were not carried out.

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8.2.14. Tele-consultation potential effects

Professional isolation

The majority of the participants considered that tele-consultations could decrease the level of professional isolation in remote PHC. The main arguments of the participants who considered that tele-consultations could have counteracted professional isolation (22 of 26) were the following:

- possibility to improve qualification (19 of 22);
- possibility of experience exchange (19 of 22),
- possibility of education (17 of 22);
- possibility to support communicational connections also with qualified specialists-mentors (17 of 22).

Staff expertise

The realisation of the pilot showed the positive attitude of the participants and decision-makers towards the tele-consultations promotion.

Knowledge exchange

The pilot implementation improved the professional level of the specialists who worked in the remote areas, made it possible to participate in the tele-consultations. The fact was proved by the 100% interest and the increase of the satisfaction level of the tele-sessions (from 70 to 93%), equipment (from 50 to 89.3%).

SWOT-analysis

Reflections on Strengths, Weaknesses, Opportunities and Threats of tele-consultation expired in the pilot, composed from the interviews and field notes to a SWOT-analysis.

Table 4. SWOT-analysis

STRENGTHS personnel potential; eLearning departments availability; support of the Ministry of Health of The republic of Belarus; continuing training; qualification improvement; counteraction of professional isolation	**WEAKNESSES** poor financing poor experience in eLearning lack of modern technical recourses, blanks in the legislation on tele-consultations in medicine
OPPORTUNITIES opportunity to learn from the masters of the profession, study modern technologies of diagnostics and treatment	**THREATS** lack of motivation of the health professionals, additional teaching and working load (programs development, etc.)

8.2.15. Lessons learned

The project realisation assisted in the following:

- Improvement of the professional level of PHC specialists in remote areas (esp. in rural areas),
- improvement of the motivation level of the PHC specialists in remote areas to use modern IT;
- the decrease of the level of professional isolation;

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- large-scale implementation of the IT into the work of PHC specialists in remote areas,
- gaining experience in using tele-consultations by the partner countries.

We also found out that for the efficient implementation of tele-consultations it was important to upgrade the equipment and IT-support, Internet connection regularly. That caused additional financial and staff resources.

8.2.16. Maintenance and further development of ICT in PHC

All the gained data will be further used in the project of the regulatory act of the Ministry of health of the Republic of Belarus on the implementation of IT into practice.

8.3. Pilot 3: KPHCD - Central hospital to home care units

Contact person: Raimo Rintala, Kauhava Primary Health Care District, Finland

8.3.1. Background

The tele-consultation pilots were implemented between Health Care Units and their doctor professionals (Pilot # 3A), home care units and nursing units (Pilot # 3B) within the Kauhava Primary Health Care District, KPHCD. Tele-consultation is common in the medical field and usually occurs at all levels, from health centres to specialist hospitals and from there to university hospitals both from those in training, experienced and less experienced ones to the next level. We wanted to arrange the tele-consultation pilot inside the Primary Health Care among our own professionals. We felt that we have the capacity to do it.

In our district lack of permanent doctors has continued several years and recently we have had difficulties to employ nurses at least for temporary positions. We have developed both our consultation and mentoring and support systems to be more attractive as an employer. We have experienced doctors, who have been consulting younger ones and those in medical training. It is not always possible to differentiate between tele-mentoring and tele-consultation because in a dialogue both may exist. Consultation is always linked with collaborative learning and professional development. Since the PrimCareIT project separated tele-mentoring and tele-consultation, we did the same. Doctors formed one tele-consultation group and in these session's patients' needs and assessment was present.

There is need to support nurses in home care units and nursing units by medical consultation outside doctors normal visiting hours. This target group was planned to form another tele-consultation group.

Pilot # 3A.

The defined pilot #3A included 5 tele-consultation group sessions with the younger doctors. We had numerous other separate tele-consultation session but all sessions were not included in the pilot.

Pilot 3B

Planned tele-consultations from the home care units (home patients) and nursing units formed another group.

Pilot was approved by the management group and the political board and it had small steering group.

Technical support was provided by the IT-staff of the organisation.

Pilot documentation and evaluation was done according to the guidelines within the organisation.

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8.3.2. Purpose and objectives

By implementing tele-consultation pilot in Kauhava Primary Health Care District our main aim was to support professionals in their daily work in order to increase their capability and know-how to prevent and solve problems with the patients at home and in the units. At the same it can support professional development and continuing education of the staff, which can counteract professional isolation by creating a functional network between the health care units and their professionals, doctors, nurses and others. With the help of a good functioning tele-consultation we hope to boost their self-confident and positive working experience, which again attracts health professionals to work in remote areas and prevent additional brain drain.

Before the implementation of the tele-consultation pilot, the consultation was mostly by phone from younger doctors to the senior or face-to-face if they were in the same location.

Nurses could consult doctor, GP in the HC, only by phone, but too often it was difficult and the patient was sent to the outpatient clinic for consultation.

Goals were:

- Implement tele-consultation as a tool to support young doctors and nurses in their demanding decision making situations and daily routines.
- Improve the access to consultation practices from home care units and nursing units.
- Counteract professional isolation through tele-consultation.
- To attract professionals to work in remote areas.

8.3.3. Timeline

The pilot was originally planned to start late 2012. There were delays in the administrative approval process and delays in acquisition of the equipment. The equipment was installed during the first part of 2013 and staff trained and operational connections tested by May 2013. Pilot geographic in Figure 4.

Pilot #3A

Tele-consultation sessions began in May 2013 and continued the whole year. During this period five tele-consultation sessions with the group of doctors formed the pilot. Other tele-consultation sessions went on simultaneously with other professionals as well.

Initial pilot session was held in June 2013. All pilot participants were beforehand shortly instructed on the PrimCareIT project, piloting and the evaluation processes. Participants profile questionnaire and pre-test questionnaire were carried out. After the last pilot session post-test questionnaire and modified focus group interview based on the respective questionnaires were carried out and pilot data collected.

Pilot #3B

This part of the project was greatly delayed firstly due to the approval process and later on due to the changes in the consultation method. During the pilot period Tablets became popular in social media. They were soon assumed much handier than laptops in tele-consultation where the nurses needed to show the patient to the doctor or the patient needed to discuss with the doctor. Request to change some of the equipment more suitable for this kind on tele-consultation inside the existing budget was made. January 2014 we received the approval and the rest of the equipment is under acquisition. Some experience was obtained during five home visits and visits to three nursing units. The minimal pilot visits were made in November-December 2013. Due to the lack of the equipment and other obstacles, the multiplication shall occur in 2014. Valuable information was obtained during these pilot visits.

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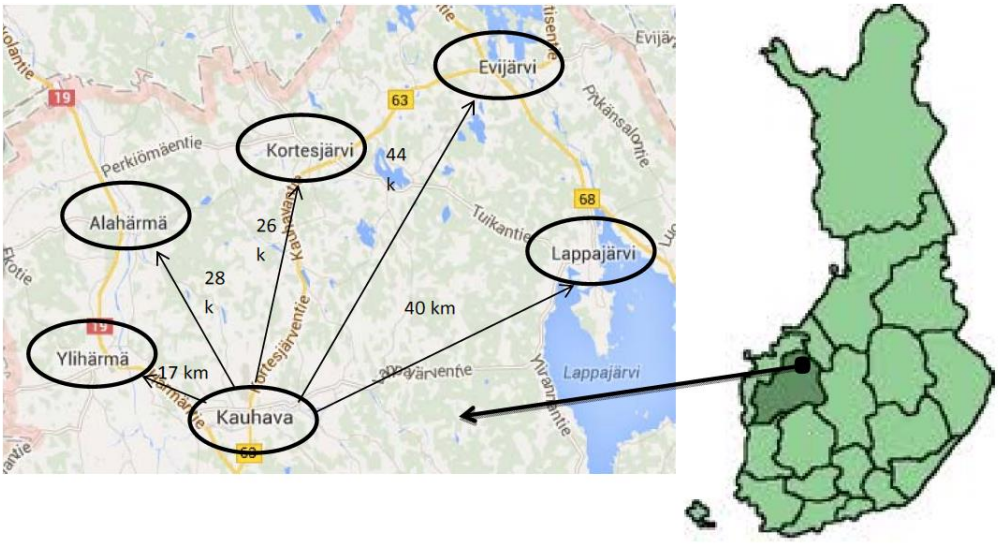
Distances

Figure 4. Kauhava Primary Health Care District, geographical area.



8.3.4. Pilot participants

Pilot #3A

The pilot participants were 1 consultant +10 mainly young doctors in our primary health care centers. One didn't have a degree yet, seven had more than 3 years and 3 more than 10 years since the diploma.

Audience profile is described in the following table (Demographics N =11)

Table 5. WP 4 / Pilot #3A Audience Profile

Profile				
Mentor or Mentee	Mentor	1	Mentee	10
Profession	Medical Doctor		1	4
	Resident			5
	Amanuensis			1
Age	< 25			
	25-30			1
	31—40			0
	41—50			2
	> 50	1		2
Gender	Male	1		4
	Female			5
Experience	Less than a year from diploma			
	3-years from diploma			7
	6-years from diploma			
	10-years and more experience	1		2

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Pilot #3B
Five patients under one home care unit had a tele-consultation home visit by the nurse responsible for their care. In three nursing homes in-charge nurse made tele-consultation visit to one patient in each.

8.3.5. Evaluation methods

Questionnaire

Pilot #3A; Questionnaire forms were the same as in other participating pilots and are seen in appendix. During the first session the demographic audience-profile and the pre-test were carried out. Each pilot session was evaluated with questionnaire and verbal feedback. In the end of the pilot the post-test was carried out. Since the number of participants was small and differences minimal, statistical conclusion was not relevant

Pilot #3B; Audience profile and pre-test questionnaire of the possible professional target group were done, but since in the end they were not part of the pilot, the results are not presented. A case study approach and qualitative process evaluation was planned instead. Feedback during the visits was noted.

Interview

Pilot # 3A; With the qualitative questionnaire we received plenty of information from pilot participants about their experiences of the tele-consultation pilot and of the factors which can affect professional isolation and brain drain in the primary health care. Based on these questionnaires modified focus group discussion was held to further elaborate views on tele-consultation, professional isolation and brain drain.

8.3.6. Tele-consultation framework

Pilot #3A. Five group tele-consultation sessions were carried out between June and October 2013 using videoconferencing equipment. On each Health centre all junior doctors were able to participate in the tele-consultation sessions. The session had a defined topic, which was selected by the participants beforehand. A case related to the topic was briefly presented, and relevant clinical procedure discussed. In the end everyone was able to come out with concerns about their own patients. Common dialogue was possible via videoconferencing. Additional digital information data, PowerPoint presentations and other Internet resources were possible to deliver via laptop linked to the videoconferencing unit. Other material for archive purposes could be sent via e-mail. Videoconferencing created almost natural “room-like” presence as stated in evaluations. This contributed to good and positive environment for dialogue during the sessions.

It is sometimes difficult to distinguish between mentoring and consultation because they often are intervened. The same was in our case with this type of group tele-consultation. In our pilot tele-consultation sessions we had a combination of dialogue and lecture. Patient perspective and collaborative learning aspect were always present. Generally dialogue was more appreciated according to the interviews but lecture was more suitable for presentation of new facts. The content of five pilot sessions were:

- Session 1: Patient complaints and procedure to deal with them
- Session 2: Legal matters regarding the death certificates
- Session 3: Working capacity and sick leave
- Session 4: Patient-Doctor interaction
- Session 5: Prescribing of antibiotics and other common drugs and statistics

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Table 6. Evaluation of Pilot 3A.

All sessions reviewed together gave the following on average results on scale 1-5

The topic was interesting to me	4.39
The general goals of the session were fulfilled	4.06
I was able to achieve my own goals for this session	3.83
Overall I am satisfied with the functionality of used technology in this session	4.19
Overall I am satisfied with the functionality of used equipment in this session	4.20

Pilot #3B: Tele-consultation with the home nursing unit and their patients. Scheduled visit regarding the review of care and treatment plan was done with the home nurse to five patients in support living (at home). One of them had additionally assessment of a large chronic wound during the dressing change. The nurse from home care unit visited the patient at home with iPad, which had 3G connection via Skype to the doctor with laptop and PC. IT-person supported the visit, because the nurse had no previous training to use iPad. The tele-consultation was firstly with the patient and secondary with the nurse. Participants were; patient, home nurse, doctor and IT support person, who was not part of the dialogue.

In 3 different nursing units nurse in-charge visited in similar way an inpatient. Main dialogue was with the patient if possible and secondary with the nurse. In this framework, there were 3 participants; patient, nurse and consultant.

8.3.7. Pilot technology

Pilot # 3A

Videoconferencing technology was chosen for this group tele-consulting pilot. It transports synchronous voice and image media between the participants. On each site we used Polycom conferencing unit and Samsung monitors maintained by Videra and operated by regional tele-service provider. Equipment was on lease based on the nationwide contract between municipalities and service provider. Through videoconferencing equipment simultaneous connections could be arranged between all Health centres of the organisation and their doctors. It made on-line dialogue possible and could be used for delivering voice, images and data. Additional data, PowerPoint-presentation and other Internet resources were available via laptop connected to the videoconferencing unit. It means that also asynchronous and synchronous electronic message method was used. For this pilot videoconferencing equipment was available in 7 different locations (6 HCs and separate Occupational health unit), but not all were in use simultaneously.
Connection was via fixed100M wideband.

Figure 5. Tele-consultation session in KPHCD

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Pilot # 3B

During the home and nursing home visits consultant was using laptop with WLAN to 100 M fixed wideband or mobile 3G. The nurse was using Tablet with 3G mobile connection. Connection was formed via Skype. Electronic patient record was available on the Laptop and PC. Patient information was not transmitted. IT-staff assisted during the pilot tele-consultations.

8.3.8. Technology and technical equipment assessment

What worked and what didn't and why

Pilot #3A; Polycom videoconferencing equipment was installed by the service provider with the help of IT staff from KPHCD. We trained 2 people on each site to assist to operate the equipment, mostly office personnel. Our aim was that the participants and other staff, who uses the videoconferencing, must be able to do it by themselves. Having a support person permanently on sessions requires more personnel and increases the costs. In the beginning there were simple problems with the operation of the technical equipment; handling of the joystick and cameras, selecting the correct conference room and connecting laptop information. Later setting up the Polycom videoconferencing equipment was unproblematic and participants mastered videoconferencing sessions easily. IT-staff was responsible for staff training and provided technical support for the pilot sessions if needed e.g. when connection was to outside from our organisation and there were firewall problems. We tested laptop connectivity to the videoconferencing. Cisco, jabber, Movi program was installed on the laptop and connection was easily made. Quality was as in laptop. iPad version was not available. Laptop and iPad connection was tried successfully via mobile 3G.

Generally the pilot participants were very satisfied with the technology and equipment apart from situations when user was not yet mastering the technical side. Functionality was the only one topic, which casted doubts and uncertainty if videoconferencing is viable. Our conclusion is that equipment functions well and can easily be managed by the participants after initial training and some practical sessions. When familiar with the videoconferencing, no outside support is needed for the sessions.

Pilot # 3B: Videoconferencing using PC camera and sound was technically working Ok, but in our case it had a user problem and medical staff was not willing to use them. Doctors use dictation in consultations via PC and if one is using camera and voice, the settings need changing back and forth. This was experienced too troublesome. Dictation and camera/voice have the same driver.
Solution is known and coming but again with delay. Central hospital district is going to have a new electronic patient record "EP-Potti". There the dictation capacity is in-build, both have their own drivers. The new system was supposed to be operational during autumn. It was delayed until the end of the year and once again until the beginning of April. That part of the project was not completed but is on agenda later on.

Pilot # 3B; We piloted with iPad, laptop and mobile 3G connection. Mobile network was pearly enough to allow conversation and picture. It was not good enough to transmit a good quality image. One tele-consultation patient had a chronic ulcer on the leg. Dressing change was going on, but doctor couldn't assess the wound situation. Sometimes inside the concrete building the connection was bad and was disconnected.

Solution could be the new mobile 4G network, which is available in bigger centrums but not in the countryside. Since the beginning of year 2014 a new band-wide 800 MHz was released and approved EU-wide for mobile network. In Finland it will be available this year in most countryside as well and able fast enough tele-consultation. Due to this reason tele-consultation with home care unit and their patient didn't proceed further than few test tele-consultations, but technic seems to be viable with 4G.

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The same situation was with the nursing units. They usually have concrete walls and mobile 3G connection was not sufficient at all. All of them have fixed fast connections and they just need internal WLAN to be functional. This poor quality was the reason why we couldn't go beyond the test tele-consultations until they have the WLAN installed. It is not a costly problem to solve.

8.3.9. Communication type assessment

Pilot # 3A; Tele-consultation was combined with dialogue and lecturing. In post-test all but one participant agreed that tele-mentoring provides a simple and practical way to support professional development both in rural areas and especially when working alone. In the end all 11felt that tele-devices (such as Tablets, PCs) are suitable in tele-consultation (9 in pre-test), the method supports professional development (10 in pre-test) and they like to use ITC-technology (9 in pre-test) when communicating with colleagues. Prearranged short consultation meetings are easier to arrange even during the busy days and costs are minimal in comparison of lost time and money for traveling. Dialogue is possible with every participant almost as naturally as around the same table. It forms a network with the participants.

Pilot # 3B; Tablets (iPads) with 3G connected via Skype to the laptop allowed dialogue with the nurse and patients at home and nursing units. Dialogue was possible in a good way. Sound quality was enough, the picture quality was less but enough so that one patient recognised the consulting doctor. The picture quality was not enough to make a proper wound assessment. Red area in the leg was visible, but no details to make a proper assessment possible. For this purpose the quality was inferior. Connection via 3G was not good enough. Low transmission caused poor picture and unstable sound. Some interruptions occurred both during home visits and nursing home visits.
Solution is faster 4G network, which will be available later this year and internal WLAN in nursing homes.

8.3.10. Participants perspective

Pilot # 3A; Information was gathered via demographic audience profile and pre-test in the first session. Each pilot session was evaluated partly with questionnaires and partly via dialogue. At the end of the piloting a post-test and qualitative modified focus group discussion was made. Method was the same as in the tele-mentoring pilot. Due to vacations and other duties, number and composition of participants varies in sessions.

Participants all had computer and Internet access. They were experienced in technical usage and social media. We have a senior doctor available for consultations and young doctors seem to consult frequently. Seven of them had a daily possibility for consultation, 2 weekly. All had possibility to participate in educational activities, 1 every day, 6 once a week, 4 at least once a month.

Pilot # 3B; The tests were not done in this group. Feedback was in form of dialogue with participating nurses and patients and process observation. Due to the delays project duration was not 15 months, but two months.

Table 7. WP4 / Pilot # 3A Tele-consultation tech usage and technical situation

Demographics N = 11

Tele-consultation tech usage	Yes	no
Experience in Instant Messaging?	9	2
Experience in discussion Boards?	9	2
Experience in Webinars/ conferences?	10	1
Experience in Moodle seminars?	3	8

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Technical situation					
				yes	no
Do you have access to the Internet?				11	
Do you have a computer?				11	
In this section, please rate the following questions	seldom or never	once a month	2-3 times a month	once a week	every day
	1	2	3	4	5
How often do you have the possibility to consult an experienced colleague?		2		2	7
How often do you have the possibility to participate in educational lectures, classes (or such)?		3	1	6	1
What are the obstacles for attending educational lectures, classes (or such)?	a) Distance = 3 answers b) Time constraints in work =8 answers c) Low quality in seminars = 1 answers d) Too specialised = 1 answers e) Too expensive = 0 answers f) Other reason = 0 answers				

Participants' experiences and attitudes

Pilot # 3A. The same test regarding the experience in work, willingness to work in remote areas, feeling of professional isolation, if tele-mentoring is able to support professional development and use of tele-devices, was done prior the pilot and after the pilot.

Table 8. WP4 / Pilot # 3A Pre-test Participants (doctors) experience and feelings

In this section, please rate the following statements	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N=11
	1	2	3	4	5	-/ +
I feel self-confident when making decisions at work?		3	3	5		3 / 5
I have experience and knowhow for solving everyday cases?		2	2	6	1	2 / 7
I have experience and knowhow for solving rare conditions?	1	5	3	2		6 / 2

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I am willing to work in remote areas (e.g. in my current workplace)?			1	9	1	0 / 10
I feel professionally isolated?	3	5	3			8 / 0
I feel tele-consultation can be used as a tool to support my professional development?			1	6	4	1 / 11
Use of tele-devices (such as iPads, PCs) in tele-consultation is suitable?			2	7	2	0 / 8
I like to use ICT-technology while communicating with my colleagues?		1	1	7	2	0 / 11

The test contained questions about professional isolation and about using tele-devices.

In the pre-test and post-test the last column shows negative (strongly disagree, disagree) and positive (strongly agree, agree) answers. Neutral is left out for the sake of clarification.
The participants were quite young but experienced with tele-devices and their use. None of them felt professionally isolated and ten of them were willing to work in remote areas. They could master everyday cases but a rare case was the challenge. During the tele-consultation pilot there were small but clear changes in all questions (N=11). Improvements: Decision making (2), solving every day cases (2) and rare cases (2), not feeling of professional isolation (3). In the end all 11 felt that tele-medicine and equipment was suitability as a tool to support professional development and consultation.

Table 9. WP4 / Pilot # 3A Post-test Participants (doctors) experience and feelings

In this section, please rate the following statements	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N=11
	1	2	3	4	5	-/ +
I feel self-confident when making decisions at work?		2	2	7		2 / 7
I have experience and knowhow for solving everyday cases?			2	7	2	0 / 9
I have experience and knowhow for solving rare conditions?		4	3	4		4 / 4
I am willing to work in remote areas (e.g. in my current workplace)?			1	6	4	0 / 10
I feel professionally isolated?	4	7				11 / 0
I feel tele-mentoring can be used as a tool to support my professional development?				4	7	0 / 11
Use of tele-devices (such as iPads, PCs) in mentoring is suitable?				4	7	0 / 11
I like to use ICT-technology while communicating with my colleagues?			1	6	5	0 / 11

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Baltic Sea Region Programme 2007-2013

Other qualitative information was gathered partly through qualitative questionnaire and partly through interview.
All but 2 had experience in messaging and discussion boards. Strengths of tele-mentoring were almost the same as in tele-mentoring; it is a dialogue and it makes one possible to criticise and disagree, ask questions, no need to travel, easy to participate, multi-participatory session easier to arrange also across organisational borders. Dialogue and participatory nature was very much appreciated in the interviews.

It was considered useful in sessions where multiple actors were needed to come to common agreement; most in mentoring/training, lecturing, consulting, when multiple actors, information distribution, short meetings, networking, change of ideas, communication between different HCs. Some participants were doubtful because of the suspected weaknesses, which existed in the beginning; technical reliability like unstable functioning, connection not possible, not user-friendly, participants poor knowledge and skills in usage. None of the participants felt that they are professionally isolated. They listed situations which may cause professional isolation; working as a lonely professional in one place, being physically far away, when difficult to participate in professional activities and continuous education due to workload or cost. Poor working atmosphere and lack of support by colleagues has strong influence on the feeling of isolation. Isolation can be a mental feeling and personal experience.

The brain drain was influenced again by; lack of support, poor working atmosphere, high workload, salary and other benefits, no time to do work properly. Especially female doctors stated that if there is no employment for the spouse and at the same time there are other very attractive positions available.

Participants felt that tele-consultation could prevent brain drain because it creates networking and supportive working atmosphere, where one feels not left alone with difficult decisions even the salary and workload doesn't change. It supports positive development in the working community, good working atmosphere and collegiality, improvement of service quality. Those qualities make staff deep-rooted. Tele-consultation can prevent professional isolation in the same ways as brain drain. It enables person to have access easily and quickly to better professional support, continuous education, consultation and current information. But more important, it enables easier communication, interaction and participation in dialogue of current affairs as if one is present. Without own motivation and activity, tele-consultation doesn't have influence.

Pilot # 3B. Below there are some comments from those patients, who participated in tele-consultation at home under home care unit. Usually home nursing takes care of the running care matters. These patients cannot usually have HC visit without assisting person and few could manage the transportation by taxi, many need an ambulance. Our plan is that each one of them could have doctor's home visit yearly or every other year in order to have the review of the care and treatment plan. It doesn't materialise due to lack of doctors. Acute situations are dealt with transportation.

K: 86y; supported living, needs daily care, hearing impairment and has a hearing aid, slight cognitive impairment.

Hearing problem gave trouble and it was not quite sure if he hears everything. He couldn't focus sight to the tablet but was following the nurse. Otherwise the communication was OK. Said that this type of consultation is slightly odd and he is more familiar with the telephone and without picture. He couldn't give a mark to the tele-consultation, felt normal interaction, neutral. Total assessment by the consultant was neutral.

E: 83y; cardiovascular problems and poor daily functions, needs daily care.

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He felt that this type of consultation is good. One can explain ones matters and see the doctor. It is easier to communicate in this way than to go to the HC. In comparison with normal visit to the doctor's office, he gave the mark 10 (scale 4-10, old school marks). The same was felt by the consultant. This time sound and picture were enough for good communication.

L, 86y; cardiovascular problems, diabetes, hearing problem and poor daily functions, chronic ulcer on leg, needs daily care and dressing changes 2-3 times a week.

She felt that communication was easy, personal contact was like face-to-face, and consultation was easy since there was no need to go to the HC. Dialogue was good. She gave mark 10.
The picture quality was not good at all to assess the wound. Wound nurse was changing the dressing and she gave mark 9 despite the poor picture quality. She felt that she was greatly supported when she was able to discuss the change of dressing with the consultant.

I, 67y; neurological problems and unable to walk; needs daily care.

She felt that in this way it is possible to participate and this type of consultation can replace a visit to the HC. Communication went very well, but the picture quality was less. She was able to recognise the consultant in the picture. She gave mark 9.

L, 87y; hearing impairment, poor daily functions, needs care 2-3 times a week.

She felt that interaction was good, real feeling of consultation. She could tell what her problem is and also ask relevant questions. She felt tele-consultation was easy and replaces consultation visit to the HC. She had used Tablet earlier to contact her son in Africa with the help of granddaughter and would like to use it herself, knew that she cannot. She gave mark 10. The same was felt by the consultant.

Comments by the wound nurse; tele-consultation gives necessary support in decision-making. It is possible to consult doctor even the picture quality was poor.
Other nurses; generally reserved attitude, not a problem to use, good impression, it is OK if client focuses, could be a daily tool, doctors home visit could be via Tablet, security factor during evenings, nights, when wound treatment, somebody falls down.
Consultant experienced that staff attitude to use Tablets was less favourable when compared how patients reacted.

Limiting factors: Hearing impairment and poor vision caused problems. Good cognition enables better consultation but the same situation is with the office consultation as well.

Comments from tele-consultation in nursing homes.
In nursing homes we have elderly people who need continuous care, are mostly bed-ridden and whose cognition is diminished. This situation is often after stroke together with age, other chronic neurological diseases or after accidents, arthritis. Doctor visits are bi-weekly or once a month and often just "paper rounds", only few patients with acute situations are consulted. These patients could not interact properly duo to those deficits. One was able to discuss and said she cannot learn to use the Tablet, but it is good to have something like that, so there is no need to go to the HC. The connection could be with one button.

Generally the picture quality was bad and voice just barely enough.
Some nurses felt the telephone is more important. They are already old and it is difficult to learn new technics. Some felt that it gives the possibility to show the patient to the consultant if needed. Some felt that regular rounds could be done mostly in this way.

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Baltic Sea Region Programme 2007-2013

8.3.11. Organisational perspective

Supporting factors

In KPHCD the telemedicine has strong support by the political leaders and the leadership. It is seen easy and cost-effective. It could replace some office consultations and is especially beneficial when the transportation is difficult. It is very appropriate in situations when patients' care and treatment plans are reviewed.

We have already plenty of tele-consultations from HC doctors to specialists. Radiological on-line consultations are daily routine, the same with ECGs. There has been following, not on-line, tele-consultations during the last year; 158 Holter recordings, 183 sensory nerve recordings and 64 night polygraphs. Possibilities are increasing all the time.

Limiting factors

Pilot # 3B; Today the 3G is not enough to able sufficient transmission. The new 4G is available this year in the countryside. All nursing homes have fixed wide-band connections and they need only internal WLAN. Now when the selection of Tablets is increasing and price low, the cost is not anymore a limiting factor.

Due to the limiting factors the pilot was delayed and could not run 15 months as planned. In fact the pilot # 3B lasted only November-December 2014. However valuable information was gathered.

Financial perspective

Pilot #3A; In KPHCD the 6 HCs are circa 20-50 km apart from the central HC. Some of the HCs have 1-2 doctors and not always a senior on site. Many of the consultations arise from similar type of problems; what are the current guidelines and what should we do. Tele-consultation in group sessions is a purposeful method to share the information and learn from each other. Without consultation support young doctors couldn't work in small HCs. Financial benefits are somewhat difficult to estimate. Main focus is on service and quality improvement, which shall bring cost savings later on.

Pilot # 3B; Most of the home care patients cannot travel from home without assistance and some of them need ambulance transportation.
Cost saving: Ambulance transportation over 100€ /case and assisting person saves minimum 3 hours working time.

Those living in nursing homes rarely have doctors visit and in acute cases consultation is difficult. If it requires transportation to the main HC and follow-up there lasts 1-3 days, cost savings could be significant; transportation over 100€, hospital bed around 200€ a night. Most benefit through regular tele-consultations are due to better assessment of needed services and quality of provided care.

8.3.12. Tele-consultation potential

Professional isolation

Pilot # 3A; One goal of the tele-consultation pilot was to counteract professional isolation. In our interviews none of the participants felt that they are professionally isolated. They recognised situations which may cause professional isolation and can cause brain drain; being the lonely professional in one place and being insecure with decisions. Our participants felt that poor working atmosphere and lack of support from colleagues has heavy influence on the feeling of isolation and can cause brain drain. Good tele-consultation practices can counteract these feelings.

Pilot # 3B; Possibility to have a tele-consultation from home or nursing unit shall increase the mastering capacity in difficult situations and support possibilities to work alone and far away both for doctors and nurses and other professionals.

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Staff expertise

KPHCD has periodically medical students and nursing students in training. All doctors under specialisation can do their general training period in our HC and those specialising in General medicine/Family medicine, Geriatrics and Occupational Health even more. They all nee good professional consultation support. We have several nurses and doctors, who are experienced professionals, but they cannot be present in every HC. Tele-consultation is a way to share their expertise. Those patients, who are in home care or nursing units usually don't need a specialist consultation from the specialist hospital. They need consultation with somebody, who knows the circumstances, resources and local guidelines. Our clinical staff has that capability.

Knowledge exchange

Knowledge exchange occurs mainly via on-line dialogue during the tele-consultation.

Time gains

Pilot #3A; For the pilot group, assuming that 3 participants have to travel each time, saved time is 3 working days.
During the period May-December 2013 we had close to 400 professionals participating in more than 40 different type of tele-mentoring, tele-consultation and other administrative sessions. If at least 150 of them had to travel, the saved time has been 30 working days.

8.3.13. Conclusion

SWOT-analysis. SWOT-analysis and lessons learned are based on quantitative and qualitative questionnaires, interviews and other feedback during the project period.

Strengths
Pilot # 3A; The tele-consultation method in groups is well accepted and it is seen easy and cost-effective way to participate. Combined structure of dialogue and lecture created a feeling of participatory approach and like being present feeling. Dialogue was highly appreciated. This type of learning method on-line is well suitable for adult, collaborative learning and forms a functional network at many levels. Savings in time and costs are remarkable.

Pilot # 3B; Acceptance by the patients was high. Patients felt that tele-consultation with mobile Tablets was close to real consultation in the office and can replace office consultation. Difficult office visit due to poor mobility is not needed. Mostly home care patients need assistance and often ambulance transportation to the office consultation. Nursing unit patients have it even more difficult. Tele-consultation overcomes these problems.
Equipment was suitable for dialogue if network connection was good.

Weaknesses
Pilot #3A; Some felt that technically the method was too complicated and difficult to master and not user-friendly and requires support staff to be permanently present. This assumption was due to the first experiences, where the unfamiliarity and poor skills to operate the system were apparent.

Pilot # 3B; The mobile 3G network was not enough to offer good quality picture. In nursing homes and in remote areas disconnections were common.

Tele-consultation was worse or not at all possible if the patient had cognitive impairment like dementia, incomplete if hearing problem or vision problem. The Staff was slightly reserved in the use of Tablets.

Opportunities
In KPHCD tele-medicine has the potential for regular management meetings, staff meetings,

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information distribution and distant working groups. It is useful when there is need to hear and see somebody from other organisation and either due to distance or timely availability face-to-face meeting is not cost-effective nor possible and the telephone communication not enough. Specialist consultations are becoming more available through tele-medicine. The more experience in PHC is gathered about tele-medicine, the more demand from the patient.

When the 4G network is available, technical standard on consultations increases. Variety of Tablets and their low price are favourable for more common use.

Threats

Tele-consultation requires that consultants are available and abled to do their work financially and as needed. Low acceptance of tele-medicine among the professionals due to assumed technical problems and difficulties in the usage could be a treat. Lack of own motivation and lack of management support could be threat. It creates some continuous costs, which could be critical if during current financial limitations, tele-medicine is not seen cost-effective.

Lessons learned

Project management requires more resources than was periodically available. Staff acceptance to use a new method can be critical. In the beginning there is need for more comprehensive training in operation technology and on each site few persons should be more capable to assist in case needed. Implementation process is demanding but also rewarding. Tele-medicine effect was much wider than assumed in the beginning e.g. dialogue can counteract professional isolation and brain drain even the participants don't feel isolated. Diffusion of tele-medicine can be fast and into many unexpected areas.
Transnational project widened the horizon and gave important inputs.

Pilot # 3B: There were technical limitations, which hampered the pilot. Personal impairments can make tele-consultation impossible if there is cognitive impairment like dementia. Consultation can be less complete with hearing and vision problems.

8.3.14. Maintenance and further development of ICT in PHC

Actions for sustainability of pilot

KPHCD has informed politicians and public about the tele-consultation and tele-mentoring pilots and its achievements. Leadership has guaranteed continuous support and financing to the system. Tele-mentoring and tele-consultation pilots have opened new possibilities with ICT in PHC. During May-December 2013 in KPHCD there have been at least 41 different type of tele-sessions and 341 participants. Doctors have short bi-weekly consultative morning meetings, bi-weekly learning sessions and monthly departmental meetings. Nurses have bi-weekly dialogue about current issues and monthly administrative meetings. Public health department has monthly meeting, outpatient department bi-monthly. Different working groups are having meetings across organisational borders and single meetings involving families and social and health officers.
As experience increases, demand for tele-services is growing and the feeling is that it is permanent and growing method in KPHCD.

Future

Feedback gave us impression that our goals were achieved. Tele-medicine prevents professional isolation and it has a definitive role to counteract brain drain at least indirectly. It supports positive atmosphere, which makes one rooted to the current workplace.

Pilot # 3B; Technology, access and operation of Internet are all becoming more cost-effective and new technical improvements are emerging e.g. 4G and Tablets.

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8.4 Pilot 4: VCC - Psychogeriatric in distant rural area

Contact person: Käte Alrutz, County Council of Västerbotten, Sweden

8.4.1. Background

Västerbotten is the largest county in Sweden, about the size of Denmark. It has 255000 inhabitants of which 50000 are over 65 years old. There are three cities and 15 communities with smaller villages geographically spread over the whole county. The main part of the elderly inhabitants lives in the smaller villages in the rural areas of the Inland.

Västerbotten County has since many years a well-functioning technical infrastructure with a safe intranet in the healthcare organisation. The hospitals have a technical support system and appointed technicians for videoconferencing. Most communities have access to fibre network, but the IT systems for patient records are not compatible between the county healthcare and the community care. The mobile network coverage is also insufficient in the rural areas.

The number of people in Västerbotten suffering from dementia is 4.500 and the incident is approximately 700 new cases per year.

Since a few years there are regional guidelines for the dementia care that form a model for basic assessment of cognitive impairment, as well as criteria for diagnosis and treatment. The most important task in caring for patients with dementia diseases is a person-centred approach and an early diagnosis is crucial.

Context

The Geriatric Centre at the University Hospital in Umeå is responsible for specialised care and rehabilitation of patients with dementia diseases. The patients are referred from the whole county. There is a ward with eight (8) places for care of patients with severe psychiatric and behavioural problems referred both from Västerbotten and from the neighbouring counties in the northern region.

The Healthcare Centres are responsible for basic dementia assessments but there is a lack of knowledge about differential diagnosis, medication and follow-ups according to guidelines. There is a certain lack of GPs especially at the rural healthcare centres, which have direct effects on the care of people with dementia.

A recent analysis of the dementia care in Västerbotten showed great differences in how the care is organised and performed. Therefore the Geriatric Centre is commissioned by the County Council Healthcare Board to support the healthcare centres with specialist knowledge.

To fulfil this commission a nurse specialised in geriatric and dementia care is appointed with special responsibility for supporting the rural healthcare centres.

Also tele-consultations have been performed as a service for some healthcare centres but it has not been a working model on regular basis for all healthcare centres in the county.

8.4.2. The pilot

This pilot implements a new structured model for psychogeriatric consultations in two rural communities, Malå and Sorsele.

The pilot includes primary care outpatients as well as patients living in community nursing homes supported by GPs from the healthcare centres at the two sites.

A geriatrician has tele-consultations once a month with the GP, a district nurse and occupational therapist (OT) at the respective healthcare centres. Community care staff from the nursing homes is

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present when needed.

The specialist supports diagnosis of dementia diseases, gives recommendations regarding medical treatment and gives advice about caretaking and social needs. The tele-consultations also work as collaborative learning and thereby counteracts brain drain and professional isolation.

Target groups

- Patients of all ages with diagnosed or suspected cognitive impairment and patients with dementia and severe behavioural or psychiatric symptoms
- Patients with considerable needs of rehabilitation for keeping or improving levels of cognitive functions as well as reducing the risk of quick deterioration.
- Patients with complications or secondary effects from medication.

Purpose and objectives

The purpose with this pilot project is:

- To achieve equal care according to the regional dementia guidelines
- Encourage professional contacts and knowledge exchange in order to counteract brain drain and professional isolation in rural areas.

The objectives are to:

- Support the primary care in diagnosis, treatment, and structured caretaking of patients with dementia diseases, cognitive impairment and/or behavioural and psychiatric symptoms.
- Evaluate if tele-consultation makes the participating healthcare staff is more comfortable with taking care of patients with dementia diseases.
- Find out if and in that case which changes are needed at the Geriatric Centre and at the healthcare centres to implement tele-consultations on regular basis.
- Try and evaluate the possibilities for GPs to have the tele-consultation at the nursing homes using mobile connections (3G) rural in areas.

8.4.3. Timeline

This pilot had a late start because of change of the participating clinic. The set up and organisation of the pilot took about two months November to December 2012. First consultation was held in January 2013. End of pilot is December 2013.

8.4.4. Participants

One geriatrician specialised in psychogeriatric and one dementia nurse both from the Geriatric Centre at the University Hospital in Umeå

- GPs, district nurse and occupational therapist at the healthcare centre in Malå.
- GPs, district nurse and occupational therapist at the healthcare centre in Sorsele.
- Nurse from the community nursing home in Malå.
- Nurse from the community nursing home in Sorsele.

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8.4.5. Technology

The technology used in this pilot is videoconferencing. Web cameras or iPads used at the Geriatric Centre with Cisco Jabber technology and Cisco/Tandberg videoconference systems at the healthcare centres; we tried iPads with Cisco Jabber for GPs to use when having consultations with staff at a nursing home.

A computer was bought to each healthcare centre for access to the patient record system in the VC-room during the consultations.

Support

An experienced technician at the medical technical department at the hospital was appointed to supply the pilot with technical knowledge and to give quick support if needed. He also took part in meetings about discovered technical issues at the community's nursing homes.

8.4.6. Evaluation

Focus

Since Västerbotten has a well-functioning healthcare Intranet and many years' experience of videoconferencing for telemedicine services, this pilot does not focus on a thorough evaluation of the technology used or staff attitudes concerning communication over video.

This pilot gives opportunity to evaluate the working model described above and finding the crucial factors for long-term sustainability.

Data collection methods

- Logging of each consultation by the specialist nurse; technical observations, participants, medical issues discussed and recommendations made and reflections made by the participants.
- Report from the geriatrician each month at the project lead meetings
- Group interview with one site and due to technical issues individual dialogue with staff at the other site.

8.4.7. Results and experiences

Tele-Consultations

- The consultations have taken place every second month at each site except during one summer month. *Totally 13 consultations* have been performed (three more are planned in Dec.) and *57 unique patients (cases) have been discussed*, some of them several times. The most frequent problems taken up were:
- Diagnosis 40 cases.
- Continued assessment at primary care level or referral to the Geriatric Centre 27 cases.
- Only medication 12 cases.
- Mainly care strategies or social issues 7 cases.

Technology experiences

- Web camera and Cisco Jabber at the geriatrician´s office at Geriatric Centre worked well.

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- Cisco/Tandberg videoconferencing systems at the healthcare centres: worked well; no consultation cancelled due to technical issues. Light and sound sufficient for the purpose.
- Consultations via mobile network using IPad´s with 3G have not been possible. The mobile network is instable and disrupted the consultations. There is also a poor coverage which causes connections problems.
- Network at nursing homes: Not sufficient for using iPads. Efforts to solve the problem did not succeed because of time and organisational issues.

8.4.8. Participants perspective

Geriatrician´s and dementia nurses

- Tele-consultation can help to fulfil the commission to support primary care with competence about dementia diseases, cognitive impairment and behavioural symptoms.
- The consultations must be integrated and scheduled in the regular work at the Geriatric Centre.
- Tele-consultation is a valuable tool for supporting GPs in how to prioritise and refer the right patients to the Geriatric Centre.
- Huge need of knowledge and support.
- Necessary to have an appointed contact person at the health-care centre responsible for planning and coordinating the consultation sessions.
- Lack of regular GPs at the healthcare centres reduces the effectiveness.
- Unnecessary time consumed when the GP is not adequately prepared.
- The specialist has realised and appreciated the different problems in rural primary care and learned about the complexity of taking care of people with different living conditions.

Healthcare staff at both sites

- All staff at both sites very positive to this working model.
- Several benefits are expressed; easy access to the specialist, increased quality in the basic assessments and the medical treatment and also in the everyday caretaking strategies.
- Increased knowledge about national and regional guidelines.
- Increased professional satisfaction as a result of the consultations.
- One occupational therapist expressed that she decided to stay at work because of the Tele-consultations that gave her possibility to professional development and learning.
- Important to have both district nurse and occupational therapist present at the consultations.
- Time must be allocated for the planning and coordination of the consultations especially when the GP in question only is working temporarily at the healthcare centre.

Nursing home staff at both sites

- Very positive to this working model.
- Has to go to the healthcare centre for taking part when their patients are to be discussed. This has not been a problem because the nursing homes are relatively close to the healthcare centre at both sites.

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Baltic Sea Region Programme 2007-2013

8.4.9. Organisational perspective

Supporting factors

- The commission to support the healthcare centres with specialist knowledge is a strong motivating factor for implementing regular tele-consultations at the Geriatric Centre.
- The well built up Infrastructure and equipment for videoconferencing in the county.
- Interested and experienced geriatrician with speciality in psychogeriatric allocated for the consultations.
- Time for the dementia specialist nurse to plan the consultations with the contact person at the healthcare centres and support the specialist when needed.
- All primary care staff has experience of different kinds of telemedicine services including videoconferencing.

Limiting factors

- Lack of GPs at the healthcare centres is a hindrance for teambuilding and development of skills and competence at the local healthcare centre.
- Planning the consultations and preparing for the different GPs is a considerable extra workload for the district nurses and to some extent for the occupational therapists.
- Mobile network in the nursing homes are not sufficient for the tele-consultations. The nurses have to go to the healthcare centre to participate.
- Different IT-systems for documentation in primary care and community care.

8.4.10. Financial perspective

County council and communities

Since this pilot is offering a new service the main gains are quality of care and long-term effects on health and wellbeing for the patients, rather than saved travel costs or time gains fort the staff. But there are of course overall cost savings for society when patients get early diagnosis and treatment according to evidence. However this will not be evaluated in this pilot.

Geriatric Centre

According to the specialist the consultations mainly supported the caretaking at Primary care level, only a few referrals to the Geriatric Centre have been avoided.

Each consultation takes about one hour plus 30 minutes documentation etc. afterwards.

Healthcare Centres

District nurse and occupational therapists have together spent on average two hours to plan and coordinate each consultation. Totally for the 13 performed plus the 3 remaining consultations 36 hours which equals a cost of about 10.000 SEK.

8.4.11. Tele-consultations potential effects

The data and overall experiences of this pilot indicate that tele-consultations can serve primary care staff with continuous learning and thus counteract brain drain. The opportunity to discuss medical and caretaking issues with colleagues at the ordinary place of work was highly appreciated by all staff and obviously has the potential to counteract professional isolation.

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Baltic Sea Region Programme 2007-2013

Time gains

Not measurable, see above financial aspects.

8.4.12. Conclusions

There is a huge need and interest for increased knowledge about caretaking of dementia diseases among staff in primary care. Tele-consultation is an effective and appreciated model for supporting primary care with competence about dementia diseases, cognitive impairment and behavioural symptoms. Staff at healthcare centres is very positive and express increased professional satisfaction as a result of the consultations. Successful consultations are dependent on the district nurses engagement. Mobile network coverage in rural areas is a problem that must be addressed.

Lessons learned

Nurses at the healthcare centres must take a large responsibility for the consultations to guarantee correct information and patient security, especially when the GP is temporarily hired and does not have knowledge about the patients.

The consultations must be integrated and scheduled in the regular work at the Geriatric Centre and time for this kind of intervention must be allocated.

Good technical infrastructure is necessary when implementing a new telemedicine service.

Public mobile network not stable enough for supporting Tele-consultations in rural areas.

8.4.13. Maintenance and further development

In October 2013 two healthcare centres in the rural communities of Vílhelmina and Tärnaby were offered the same tele-consultation service by the Geriatric Centre. They immediately accepted and consultations will start in December 2013 and January 2014. Plans are made for the specialist nurse to start having Tele-consultations about strategic and person-centred caretaking issues with rural healthcare centres.

Actions for sustainability of pilot

Tele-consultations towards rural healthcare centres are put into the care-program of dementia diseases of the geriatric centre.

Technical barriers between healthcare and community care; the technical support and economic responsibility is not solved but under discussion.

8.4.14. Future

The Geriatric Centre has through this pilot had the opportunity to create and test a model for structured tele-consultations to rural healthcare centres. The experiences are very good and both the head of the centre and the staff are satisfied with the working model and it is now integrated in the regional care program for dementia diseases.

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8.5. Pilot 5: VUHSK – Remote General Practitioner

Contact person: Domantas Stundys, Vilnius University Hospital Santariškių Klinikos, Lithuania

8.5.1. Background

The general objective of WP4 Pilot #5 was to explore and choose the best available tele-monitoring and tele-consulting options in terms of software, hardware and human resource, in order to create a possibility to improve professional skills and reduce professional exclusion of general practitioners (GPs) working in remote areas by using tele-consulting, sharing of patient medical data/images, monitoring of some health functions.

Purpose and objectives

The purpose of our pilot was to setup a tele-consultation environment in Vilnius University Hospital Santariškių Klinikos (VUHSK) and 3 geographically remote primary healthcare centres (PHC): Anykščiai PHC (120 km from Vilnius), Druskininkai PHC (120 km from Vilnius) and Neringa PHC (350 km from Vilnius); and to test the possibility to improve professional skills and reduce professional exclusion of those remote GPs using tele-mentoring and online tele-consultations. By implementing pilot in 4 different locations of Lithuania, we aimed to create a prototype of professional network where less experienced physicians (mentees) are motivated to improve their professional skills via tele-consultations in their routine work. One of the goals was to evaluate pilot equipment (both ICT and medical), suitable for spin-off of telemedicine and tele-mentoring.

The prospective study, which was carried out during the pilot period allowed us to measure:

- acceptance of distance tele-consulting solutions,
- level of efficacy and confidence using tele-consultation to achieve patients consultation tasks,
- needs formulated by young and presumably less experienced medical professionals working in remote/rural areas.

8.5.2. Timeline

The pilot implementation phase had started with some delay due to misleading initial understanding that two VUHSK pilots, both tele-mentoring (WP5) and tele-consultation (WP4) were to run simultaneously.

During December 2012 – May 2013 pilot sites were selected, intensive evaluation of possible telemedicine equipment and tele-conferencing solutions was done. After debates between the physicians working at remote pilot sites and university hospital specialists, the fields of telemedicine for the pilot were selected: cardiology, ophthalmology, dermatology.

Some equipment (easily available) as a demo was provided free of charge by several companies in order to evaluate their technical capabilities and suitability for use within our pilot study.

The extensive market analysis of available telemedicine diagnostic equipment was carried out taking in mind several important criteria, such as particular technical capabilities, wireless data transfer possibility, equipment size, simplicity of use, software support, interoperability with hospital information system (HIS). The most suitable equipment was chosen for initiating equipment rent procedure.

June 2013 – finalisation of telemedicine diagnostic equipment market research and preparation of the public procurement documents for diagnostic equipment rent.

July 2013 – September 2013 – public procurement procedures were carried out and the winner

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company was selected. Equipment according to contract specifications was obtained by the winner company and delivered observing rental contract conditions. HIS, software adaptation processes and equipment installation was started.

October 2013 – December 2013 – tele-consultations were started; software customisation and continuous adaptation of HIS were carried out on request and notices from pilot sites, bug fixes constantly addressed, software maintenance and technical support provided.

Due to some delay of pilot initiation and implementation, the pilot wrap-up and data evaluation was started on the 14th of January 2014.

Until the 20th of January 2014 the participants of the study were interviewed following the translated and slightly customised WP4 Interview Protocol.

8.5.3. Participants

Experienced GPs (consultants) working at Family Medicine Centre of VUHSK, some specialist doctors (experts) working at VUHSK (Mentors and consultants centre) and presumably less experienced GPs as well as medical nurses (mentees) working in the smaller ambulatory GP clinics or PHC were enrolled in the study:

- 4 GPs (consultants) working at Family Medicine Centre of VUHSK;
- 2 dermatologists and 2 ophthalmologists took part in the pilot as external experts;
- 37 GPs (mentees) working in geographically remote PHC: Anykščiai PHC (100 km from Vilnius), Druskininkai PHC (140 km from Vilnius) and Aukštadvaris PHC (50 km from Vilnius).

The small deviation in terms of pilot sites was addressed as due to lack of overall interest in the pilot Neringa PHC specialists opted out and Aukštadvaris PHC was included in the pilot study instead.

As the parallel Tele-mentoring Pilot Study #5 within WP5 was initiated in June 2013, same GPs working in remote pilot sites were being proposed to take part in both pilot studies (n=37). Of those GPs, 19 mentees completed WP5 O5.2 Pilot Audience profile. Their brief demographic data is presented as follows:

- 19 mentees: 18 GPs and 1 nurse;
- Male/female ratio – 13:6;
- The main age group of respondents was >50 years (n=13);
- The majority of study participants practice medicine >10 years after licence accreditation (n=18).

As many as 12 pilot study participants completed the translated and adapted WP4 Interview Protocol.

8.5.4. Evaluation methods

The information required for pilot study evaluation was collected with the help of standardised WP4 Interview Protocol questionnaire, which was translated, minimally adapted and conducted on the phone for the final evaluation of tele-consultation pilot.

Some reference on demographic data was collected out of responses to WP5 O5.2 Pilot Audience profile questionnaires.

Most of added-value comments were noted during occasional face-to-face meetings in pilot sites and phone calls, as a number of various technical issues (bugs) were addressed during the study follow-up period.

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8.5.5. Tele-consultation modes (types of sessions)

Three more specific medical fields within the scope of family medicine were chosen in order to run the tele-consultation pilot: cardiology, dermatology, ophthalmology.

Distinguishing of these medical fields allowed us to carry out specific tele-consultation sessions which included:

- Collecting, sharing and storing of patient medical data (including images),
- Monitoring of some health functions (e.g. ECG, arterial blood pressure),
- Possibility to have live video conferencing sessions.

8.5.6. Technology

Equipment available in the market and software for implementation of the pilot workflow was thoroughly evaluated and chosen for study follow-up period. One of important criterion of equipment selection was the specification of Server Software & Hardware solution being capable to administrate tele-consultation sessions, integrate with EHR, EMR, HIS systems (particularly Santa-HIS, used in VUHSK), providing unlimited or at least 10 client software licenses for Windows and iOS devices.

10 equipment sets for 4 sites (3 remote and 1 for VUHSK Family Medicine Centre) were rented. Sets comprised different types of medical diagnostic equipment:

Type 1 – 4 sets, 1 for each pilot site:

- Tablet computer (Type 1): Windows 8 compatible, with teleconferencing client, able to transmit audio, video and desktop sharing, equipped with Wi-Fi Access Point, GSM/3G communication device (iPhone);
- Diagnostic equipment (Type 1):
    - ECG device, fully diagnostic, 12 lead, wireless, integrated with Tablet computer (Customed Custo cardio 110BT)
    - Ophthalmoscope with iPhone connectivity (Welch Allyn iExaminer)
    - Dermatoscope Type 1 with iPhone connectivity (FotoFinder HandyScope)
    - Blood Pressure Monitor with iPhone or iPad direct BT connectivity (iHealth blood pressure monitor).

Type 2 – 1 set:

- Tablet computer (Type 2): iOS compatible, with teleconferencing client, able to transmit audio, video and desktop sharing (iPad Mini with Vidyo client), equipped with Wi-Fi Access Point (AirPort Express Base Station);
- Diagnostic equipment (Type 2):
    - Dermatoscope Type 2 with iPad connectivity (Dermlite II Hybrid M)
    - Blood Pressure Monitor with iPhone or iPad direct or Wi-Fi connectivity (iHealth blood pressure monitor).

Type 3 – 5 sets:

- Tablet computer (Type 2): iOS compatible, with teleconferencing client, able to transmit audio, video and desktop sharing (iPad Mini with Vidyo client), equipped with Wi-Fi Access Point

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(AirPort Express Base Station);

- Diagnostic equipment (Type 2):
    - Blood Pressure Monitor with iPhone or iPad direct or BT connectivity (iHealth blood pressure monitor).

Windows 8 or iOS based Tablet PCs were intended to be used as devices, acting as hubs in case particular device connects to server via Bluetooth and also for live tele-conferencing sessions.

8.5.7. Technology and technical equipment assessment

ECG devices

Research on ECG devices was carried out taking into account several specifications which were considered to be of great importance in order to provide tele-consultations (see Table1). Market was explored; the manufactures or distributors of relevant devices were contacted by e-mail (i.e. Contec Medical Systems Co, Schiller, Proplus, CustoMed, Mortara, Maestros Electronics & Systems, SHL, etc.). We also contacted several distributors in Lithuania and started testing the range of devices readily available in Lithuania.

Mortara ELI 10

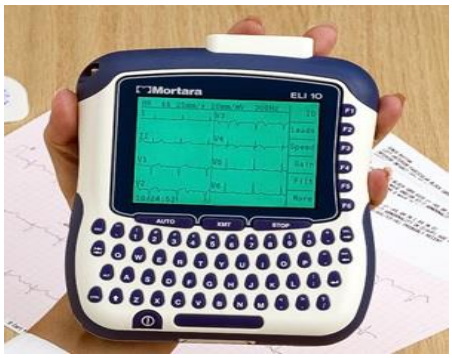

Figure 6. Mortara device

About device: High-resolution backlit LCD display provides real-time preview of 12-lead ECG and VERITAS™ interpretation results to ensure high-quality data acquisition. Offers a range of bidirectional communication options including USB, internal modem, GSM/GPRS mobile, LAN, or WLAN. ECG orders can be exchanged with Mortara's E-Scribe™ and Athena products as well as compatible third-party ECG management, EMR, HIS, CVIS, and PACS systems via XML, PDF, UNIPRO, HL7, and DICOM®.

During testing phase personnel found that LCD display was too small and not convenient to watch, the ECG was displayed only after the full recording without the possibility to adjust the quality while recording, full alphanumeric keyboard was found not to be practical to use with buttons being too small. Moreover, one of the cables broke. Overall, the acceptability of this ECG device found to be low in our premises.

Schiller MS-2010

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Figure 7. Schiller device

About device: This ECG system features 12 channels and is appointed with a 10.4" high resolution touch display. This colour interface lets record, select and print from the best recorded ECG. Connects via LAN, WLAN or GPRS to SEMA or HIS. Capable of PDF export of resting ECG reports. Automated workflow: acquire, print, save, transfer and retrieve diagnostic ECGs to and from SEMA or HIS – all automatically. Support for HL7 work lists.

During testing phase we noticed that device needs some additional original add-ons which made it expensive for us to rent it. We also were not satisfied with the quality of stickers and found the unit quite heavy (probably due to printer integration into the device). Also, we noticed some deficit of keyboard inputs.

Dyna Vision ™

Figure 8. Dyna Vision

About device: Dyna-Vision™ is intended for general hospital, clinical, outdoor and home-use applications by medical professionals whenever it is required to assess patient's long-term, continuous, ambulatory ECG and/or SpO2. The Dyna-Vision™ unit is classified as a class IIb medical device and is allowed for use in intensive care environment. This product allows a trained physician or other healthcare professional to record, store and/or remotely transfer ECG and/or oxygen saturation (SpO2) non-invasively in mobile patients. The available data transfer methods are Bluetooth, USB and GSM. All transfer methods are integrated in the device. Patients can be monitored in real-time using software on a computer, tablet PC or Smartphone.

During testing we were not satisfied with provided software, data was possible to transmit to vendors servers without integration possibilities during renting period.

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Customed Custo cardio 100

*About device:*12-channel PC ECG system is supplied with power directly via the USB port.
The flexibility underlying this system allows the user to record and display at any time and any place ECGs in highest medical quality, with a PC, Notebook or Tablet PC.

During testing phase we were satisfied with written ECG quality, the software was found relevant, convenient and the unit was not heavy.

Customed Custo Cardio 110BT

Additionally was equipped with Bluetooth connection and it made this device even more attractive.

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Table 10. Market research of ECG devices.

Company	Device	Leads number	Technical data	Weight	Data transmission	Software	Drop out cause
ProPlus	Tele-ekg	3, 7 or 8 leads	No display	300 g	CSD or GPRS modem; Bluetooth/WiFi	-	Didn`t reply to enquiry
	EHO12	12 leads	No display	100 g			
Corscience	TE-SYS (BT12 ECG device)	12 leads	LCD display	254 g	GPRS/WLAN	ECG software VM300	Focusing on selling high quantities of products
Contec Medical systems	Contec8000W	12 leads	3.5'TFT display	500 g	3G/Wi-Fi	-	Does not have CE certificate
Dyna Vision	Dyna Vision	3, 6, 12 leads	No display	190 gr	Internal GSM, Bluetooth +EDR and USB	Dyna-Vision software	**Tested**
Custo med	Custo cardio 100/110 BT	12 leads	No display	295 g/ 275 g	Bluetooth	Custo diagnostic 3.8 or higher	**Tested**
Cardioline	Cardiette microtel	12 leads	LCD display	375 g	Bluetooth/sound coupling	-	Minimised keyboard
eKERNEL	"eKERNEL"	12 leads	No display	N/N	GPRS/ Bluetooth/LAN	N/N	Lack of clear information for further

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	Tele-ECG system						possible communication
The Commwell Inc.	Physioglove	12 leads	N/A	N/N	Bluetooth	N/N	Designed for homecare
Card Guard	SelfCheck™ ECG	12 leads	N/N	98 g	Bluetooth	ECG transmitted to PMP web center	Expensive server maintenance
Maestros	eUNO-R10 device	12 leads	N/N	N/N	mobile ECG application eUNO R10 for BlackBerry smartphones	Rhythms24x7 Server	Didn`t replay to enquiry
Schiller	MS-blue	12 leads	OLED inc. ECG curve	115g	Bluetooth + EDR	SEMA3	**Schiller MS-2010 (tested)**
Mortara	T12S, X12+	12 leads	ECG curve	N/N	Wireless	N/N	**ELI 10 (tested)**
SHL	Smartheart	12 leads	N/A	N/N	Bluetooth	Service is provided by SHL's medical monitoring center	Designed for homecare
	CardioSen'C	12 leads	LCD display	N/N	Cellular modem, ECG transmitted acoustically	Service is provided by SHL's medical monitoring center	Designed for homecare

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Baltic Sea Region Programme 2007-2013

Upper arm blood pressure monitors (BPM)

Figure 9. iHealth BPM, Withings BMP and Beurer BM90.

We have tested three upper arm blood pressure monitors in order to find the most reliable and relevant device (see Table2). Major technical specifications of selected devices were quite similar. We have chosen iHealth BPM for the pilot. It had the lowest weight; it was very intuitive in terms of use and most easy to perform blood pressure measurement with this unit. Convenient wireless connectivity: Bluetooth. The design and application was also very attractive.

Table 11. Main technical specifications of BPM considered for pilot study.

Product characteristics	iHealth BPM	Withings BMP	Beurer BM90
Unit size	145mm x 58mm x 30mm	150mm x 140mm x 100mm	140 mm x 60 mm x 56 mm
Cuff circumference	22 - 42cm	22 - 42 cm	22 - 42 cm
Weight	135g	600 g	471 g
Measuring method	Oscillometric, automatic inflation	Oscillometric, automatic inflation	Oscillometric automatic inflation
Cuff pressure range	0 - 295mm Hg	0 - 285 mmHg	Cuff pressure 0–300 mmHg, systolic 30–280 mmHg, diastolic 30–280 mmHg
Pressure accuracy	±3mm Hg	±3 mmHg	± 3 mmHg
Pulse rate range	40 -180 beats/min; accuracy: ±5%	40 - 180 beats/min; accuracy: ±5%	pulse 40–199 beats/min; ± accuracy: 5%
Connectivity	Connects with iPhone, iPad or iPod touch (iHealth MyVitals app) wireless	Connects with iPhone, iPad or iPod touch (Withings app), wired, older iOS devices only	iOS and Android apps available, possible connection via Beurer-wireless- connect Homepage, via Whitebox.

Dermatoscopes and ophthalmoscopes

In order to obtain device's web-connectivity and capability to integrate the recorded/collected data with HIS, we were focused on diagnostic units which were capable to connect to internet via Windows 8 or iOS based tablet PCs. As a result we have researched several units which more or less met our criteria. Those included:

- Handyscope by Fotofinder (proposed by external company for rent)
- Dermlite DL2 Hybrid M (proposed by external company for rent)
- Dermlite DL2 Pro HR
- Dermlite DL2 Pro
- Dermlite DL3
- Welch Allyn iExaminer (proposed by external company for rent)

Figure 10. Handyscope by Fotofinder (dermatoscope)

Figure 11. Dermlite DL2 Hybrid M (dermatoscope.)

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Figure 12. Welch Allyn iExaminer (ophthalmoscope).

All above mentioned devices had specially designed connection kits (adapters) to easily connect those either with iPhone 5 or iPad tablet PC.

8.5.8. What worked and what didn't and why?

Technically it was rather complicated to integrate rented devices to practice, as there were multiple technical issues in terms of HIS interoperability. Special adaptation within HIS was needed which took more time than initially planned in the pilot implementation phase. Subsequently the pilot follow-up period started later than planned.

The rented devices (as hardware) performed well as stand-alone units. To be mentioned, that ophthalmoscopy was rather difficult to perform qualitatively and needed more teaching and practice. Data (image) transfer, storage and access within HIS were solved by software programming.

Live synchronous video conferencing was available, but was not widely used among pilot participants.

Out of those 12 respondents of WP4 Interview Protocol questionnaire, 11 participants rated "2.1.1 Equipment/technology used" as 8,27 out of 10 and "2.1.2 WiFi/LAN used" as 7,54 out of 10.

Need of time/support/development

More time is needed to further develop newly created iOS application and make it even more intuitive (several-button-click like). Continuous maintenance, update and technical support within HIS is also needed.

8.5.9. Communication type assessment

In a 3-month period 102 tele-consultation sessions between VUHSK and Anykščiai, Aukštadvaris, Druskininkai PHC were carried out. 72 cases were cardiology related

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conditions (arterial hypertension, chronic atrial fibrillation, chest pain, etc.) and 30 cases were dermatology related.

Tele-consultation based services allowed for mentees to manage 74 cases on their own (72,5 %); further diagnostic tests were needed for 22 patients (21,5%) and 6 patients (5,8%) were referred to hospital emergency department.

In cardiology related group the diagnosis was confirmed in 67 cases, rejected in 3 patients.

In dermatology related group the diagnosis was confirmed in 22 patients and rejected in 8. Four patients in 2 weeks were consulted by dermatologists and their diagnosis was confirmed.

What worked and what didn't and why?

Based on the answers to WP4 Interview Protocol questionnaire (n=12), 7 mentees took part in tele-consultation for the first time and 5 of them had previously taken part in similar consultations. All respondents think that tele-consultation is useful in their practice.

Need of time/support/development

Some mentees in WP4 Pilot Interview expressed their preference to have more various equipment which could transfer patient's medical data to medical specialists in particular medical field.

8.5.10. Participants perspective

Most participants said they were happy to take part in such online consultation due to various reasons (on site availability, no need to travel, opportunity to deepen their professional knowledge without leaving working places, established better contact with their patient, etc.).

WP4 Interview Protocol questionnaire revealed that pilot organisation was rated 7,54 in the scale of 10 (n=11), quality of the information shared in the sessions – 8,36 and outcome of consultations/mentoring sessions - 8,09 respectively.

8.5.11. Organisational perspective

Supporting factors

Acceptance of tele-mentoring and tele-consultations among GPs was very high. This is actually a very big supporting factor. Wide deployment of Telecommunication networks in Lithuania is another very big supporting factor. Gigabit fibre Internet is available almost in every small GP office, 3G network coverage is also very high (86,1% at level of -105dBm), GSM – 98,8% at level of –95dBm (data provided by Omnitel operator).

Minister of Health of Republic of Lithuania has issued several orders regarding tele-radiology, tele-cardiology and telemedicine services in general, opening possibilities to provide tele-medicine services legally in Lithuania.

Limiting factors

Lack of reimbursement schemes of telemedicine services from the National Patient Fund is the largest limiting factor for tele-consultations in Lithuania. Lack of equipment, capable to transmit data is also an influencing factor. Most health care providers are already equipped

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with modern ECG recorders and other diagnostic instruments, what makes difficult and sometimes impossible to upgrade this equipment to some, capable to transmit medical data. Administrators of medical centres and decision makers don't see return from investment into telemedicine dedicated or tele-enabled equipment.

8.5.12. Financial perspective (travelling / time)

We consider 102 tele-consultation sessions carried out: 45 of them were carried out for mentees from Druskininkai PHC, 43 for mentees from Anykščiai PHC and 14 for mentee from Aukštadvaris.

The distance from Vilnius to Druskininkai is approximately 140 km; the distance to Anykščiai is approximately 100 km, the distance to Aukštadvaris - 50 km. While performing our calculation we assumed that it takes from 1 to 2 hours to go one-way trip.

Tele-consultation was able to bring notable travelling cost savings. Taking into account an average fuel price and estimation per both way trip by car (1,3 Eur/L x 7,7L/100km), the patient from Druskininkai would spend 28 Euro on one both way trip. The patient from Anykščiai would spend 20 Eur and one travelling from Aukštadvaris would spend 10 Eur respectively per both way trip.

One way bus trip Vilnius-Druskininkai costs approximately 11 Eur, Vilnius-Anykščiai – 7,5 Eur and Vilnius-Aukštadvaris – 4 Eur.

It is worth to note that travelling by public transport often brings additional time loss. Therefore, costs of taking a day off as a sick-leave should be considered.

8.5.13. Tele-consultation potential effects

WP4 Interview Protocol questionnaire revealed that 33% of respondents (n=12) believe brain drain issue being significant in remote primary health care. Majority of them answered "Don't know" to the question if tele-consultation could counteract brain drain, 2 respondents gave positive and 1 mentee gave a negative answer.

In terms of professional isolation, 66% of respondents consider it being an influencing factor in remote primary healthcare. As many as 11 respondents believe tele-consultation could reduce professional isolation and only 1 mentee stated his doubt by answering "Don't know".

8.5.14. Conclusion

The responses to WP4 Interview Protocol provided main feedback from which the SWOT-analysis as well as lessons learned were formulated. Mature and valuable comments were also noted from occasional face-to-face meetings, e-mail communication and phone calls.

Strengths: Acceptance of tele-consultation was high among family doctors. Most of them saw such services as an opportunity to deepen their knowledge and provide high quality services to their patients at the same time. Most of mentees expressed the feeling that tele-consultations could facilitate better contact with specialist doctor at bigger centres, thus decreasing professional isolation.

Weaknesses: This service could be considered expensive method in terms of equipment and technical support. Traditional method of consultation was preferred among older medical

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professionals as handling specific telemedicine equipment seemed somewhat complicated. Regular software maintenance and at least basic ICT literacy was needed.

Opportunities: Tele-consultation is an innovative approach. Similarly to tele-mentoring, it could be a good tool to develop professional experience of younger medical specialists. It could also be one of the factors reducing potential professional isolation and brain drain while working in remote areas.

Threats: expensive equipment, difficult to motivate health care administrators to make upgrade/investments if they already have similar equipment without data transfer capability. There is some probability of various technical issues as more ICT services are used.

8.5.15. Maintenance and further development of ICT in PHC

Actions for sustainability of pilot

Tele-consultation and tele-mentoring pilot in Lithuania made positive impact both in educational and clinical environment. Vilnius University Hospital Santariškių Klinikos decided to establish a multidisciplinary telemedicine centre, responsible for technical and management aspects of providing telemedicine services.

Vilnius University Hospital Santariškių Klinikos also applied for support of EU Structural Funds and won tender for innovative telemedicine services project. This infrastructural project will create technical basis for telemedicine services (server, hardware and software for the telemedicine platform). Legal issues are also pending and going to be solved until the end of the Project (2nd quarter of the 2015). The experience of the tele-consultation pilot is widely used in the Project.

Equipment, rented during the pilot is available for partners (pilot sites) for rent or for purchase with the discounted price. The list and specifications of the equipment, used in the pilot, will be available for all primary care centres of the country.

The actions regarding centralised reimbursement of the telemedicine services must be taken in the closest future, motivating consulting institutions and their specialists provide sustainable tele-consultation services.

8.5.16. Case description

A family doctor working in Anykščiai PHC was enrolled in the study in October 2013 after she was trained to use telemedicine equipment (Type1 set).

As an example of tele-consultation, the following case could be presented. A 55-year-old male complained of having chest pain. Past medical history was non-contributory. The patient explained his complaint as a deep pressure in the left chest area with the intensity rated 6 out of 10. The pain did not irradiate and lasted a couple of minutes. It had occurred during exercise. The patient also had some dyspnoea associated with the chest pain when he had been exercising. The recorded and transferred ECG revealed normal sinus rhythm. The diagnosis of stable angina pectoris was established and the patient was referred to further examination.

On the 21st of Dec 2013, the mentee submitted responses to WP4 Pilot Interview questionnaire (Table 12).

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Table 12. Responses of mentee to WP4 Pilot Interview questionnaire.

Questions	Answers
1. Is this your first experience using tele-consultation or distance learning?	Yes
2. Do you feel it is useful for you to use tele-consultation in your practice?	Yes
3. Thinking about your answer about usefulness, would you please explain:	Feels like in a real consultation
4. What factors would you specifically identify as influencing?	Professional isolation
5. Do you feel that tele-consultation could counteract brain drain in family practice?	Yes
5.1 Thinking about your answer, would you please explain:	No need to go elsewhere, easy to get professional consultation
6. Do you feel that tele-consultation could counteract professional isolation in family practice?	Yes
6.1 Thinking about your answer, would you please explain:	Same as above
7. Ideas what should be improved in our tele-mentoring program?	Internet connection was rather slow
8. Anything else you would like to share?	No

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8.6. Pilot 6: Estonian Vormsi Health Center GP support

Contact person: Madis Tiik, Tallinn University of Technology, The Institute of Clinical Medicine, Estonia

8.6.1. Background

Vormsi island, around 200 inhabitants during winter time and about 400 inhabitants during summer time and weekends in Estonia. Practise is open from Monday-Friday 8 hours per day, and in this time nurse is there. Doctor is visiting the island once a week, in other days we communicate over Skype.

Purpose and objectives

- Implementing distance consultation between nurse and doctor.
- Testing telemedicine equipment for delivering test results.

Timeline

1.2.2013 - 1.12.2013

Participants

Ada Ojasaar – nurse

Madis Tiik – family doctor

Evaluation methods

Interview (added)

Tele-consultation modes (types of sessions)

- Nurse and family doctor using Skype chat
- Nurse and family doctor using Skype video call
- Nurse and specialised doctor Skype chat
- Nurse and family doctor using SMS messages

8.6.2. Technology

In Vormsi PHC center we have ordinary laptop computer (for the nurse) with 10MB Internet connection. Family doctor uses laptop and Nokia Lumina smartphone. In all devices Skype software is used.

For collecting bio-signals from patients we use AMD telemedicine system and integrated

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devices (digital-stethoscope, digital-camera for skin images, digital-otoscope, spirometer, EKG, SpO2, quick lab tests)

Figure 13. AMD telemedicine systems.

We use Ester AP+ Electronic medical record system for documentation medical events and Edgewise software which is integrating signals from different devices. Both software are web-based and are accessible from the distance.

8.6.3. Technology and technical equipment assessment

What worked and what didn't and why

We haven't had any problems with communication, there were some integration issues between devices at first, but they did not influence our every-day work.

Need of time/support/development

We need deeper integration between tele-medicine equipment and EMR on the one hand and on the other hand we need integration with EMR and communication tools, in this manner that the communication between a nurse and a doctor, or a patient and a nurse or a doctor will be a part of the EMR.

8.6.4. Communication type assessment

Mainly we have used Skype chat, e-mail or SMS – which can be all named offline consultation.

Skype chat was usually in real-time - online consultation.

What worked and what didn't and why more why information

Because of the "mobile" lifestyle of the doctor (working in Vormsi PHC center and in Helsinki, Finland) – for the face-to face and online video calls were not easy to find suitable timeslots. But it turned out that it is not necessary at all, because all the other tools we were able to use (telemedicine devices, web-based software)

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Need of time/support/development

Communication between nurse and doctor is routine procedure in our practise. Development needs were described earlier.

8.6.5. Participants perspective

PHC workers experiences and attitudes

Only positive experiences were found from both sides.

8.6.6. Organisational perspective

Supporting factors

Existing telemedicine equipment and over 10 years' experience of using the communication tools.

The nurse has also 5 years' experience working at the telephone advice service "1220 Family doctor's help-line".

Limiting factors

We didn't find any limiting factors in using tele-consultation.

8.6.7. Financial perspective (travelling/ time)

Compared to a situation in which the PHC professional would be travelling (to one distant health centre), the save of the costs in the XX pilot sessions: *save of time of travelling: XX hours x XX € salary/ hour = XXX €/ per person*

- Travelling time with ferry to island takes 45 min and costs 3.20 (return ticket)
- Bus ticket on the island costs 1.04 (one way)
- Need for consultation accrued in average 2 times a week
- Doctor's average salary per hour is 10€
- Travel time by car from Haapsalu (doctors living place) to Rohuküla (ferry harbour) takes 10minutes (8 km)
- 3.20 +(2x1.04) + (2 x 10)= 25.28 this is money saved by one consultation
- During 1 year the annual savings are 52x25.28 = 1314.56 € (not including travel time and expenses for the car)

8.6.8. Tele-consultation potential effects

Professional isolation

We didn't realise any manifestation of professional isolation. Both members were advanced users of telemedicine and distance consultation and it has been part of the island's medicine already for several decades (there were times when nurse and doctors were visiting island once or twice a month).

Instead of waiting the patients in the island's PHC centre, the doctor could spend his time in

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much more valuable way.

In our case, the family doctor works in Finland consults Finnish people to reach better telemedicine and e-health services.

Staff expertise

We have positive experiences and tele- consultation and tele-monitoring is a routine procedure in our practise.

Knowledge exchange

I have given several lectures about distance-consultation in Estonia and in Finland. If there were more such places like Vormsi (equipment and readiness) then it would be possible to make a network between those practises, which would give more ground for knowledge exchange.

Time gains

Time gains in Vormsi were transferred to time spent working in Finland.

8.6.9. Conclusion / basis for this analysis in interviews

SWOT-analysis

Strengths

Strong commitment from staff

Existing technology

Weaknesses

Small number of cases

Too small size of the practice

Juridical issues (responsibilities between nurse and doctor)

Opportunities

This good example can be expanded to other regions

Threats

Cost per unit is high (if calculate the cost of the telemedicine equipment and devices)

Not officially accepted by officials

8.6.10. Lessons learned

It is easy, if you have skilled personnel and good equipment.

8.6.11. Maintenance and further development of ICT in PHC

Actions for sustainability of pilot

It is routine of our practice and will continue

Future

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Deeper integration between equipment and EMR.

Case description

Vormsi Island; around 200 inhabitants during winter and 400 inhabitants during summer and in weekends in Estonia. Practise is open from Monday-Friday 8 hours per day, and during this time only nurse is there. Doctor is visiting the island once a week, in other days the nurse and doctor are communicating over Skype.

8.7. Pilot 7: National Health Service - Supporting GPs from remote areas via tele-consultations

Contact person: Aigars Miezitis, National Health Service, Latvia

8.7.1. Context

The scope of activities and functions of the NHS is to:

- **administrate the State budgetary funds** prescribed for health care and in accordance with the concluded agreements to settle accounts for the provided health care services, as well as the medication and medical equipment prescribed for outpatient treatment;
- **supervise the expenditures of State budgetary funds** in medical institutions and pharmacies submitted to the administration of the National Health Service;
- **analyse the financial and quantity indices of health care services**, to make prognoses concerning the volume of health care services, as well as to evaluate the necessity of these services;
- **inform the society about the available health care services** and the procedure according to which the latter can be received, as well as advise the country's residents on their rights while receiving health care services;
- **organise and carry out the State centralised purchases** of medications and medical equipment in the field of health care, which are stipulated in the normative acts;
- **provide with the implementation of the programme on timely detection of cancer**;
- **in the regression procedure to recover the financial means** for course of treatment for persons, provided that the present course of treatment is the consequence of an unlawful activity, inactivity or criminal offence;
- **ensure the execution of the international liabilities** in the implementation of the availability of health care services, as well as in the administration of the State budgetary funds prescribed for health care;
- **determine the health care services funded from the State budget** and calculate their tariffs;

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- **develop, maintain and update the list of State reimbursed medicine**, that is based on the principles of health economics;
- **develop health care financing models** and to determine types of health care services funded from the State budget;
- **approve medical technologies and register them**, to create and maintain the medical technology accounting and database;
- **develop and evaluate clinical guidelines**, as well as ensure the implementation of methodological guidance;
- **develop guideliness of rational pharmacotherapy**;
- **administer the Medical Treatment Risk Fund**;
- **cooperate with foreign and international institutions**, as well as to exchange information in the field related to the service;
- **implement the e-Health programme according to the policy decided by the State** (now carrying several co-funded projects by ERDF (European Regional Development Fund): electronic health record; e-booking; e-prescription etc.).

In this context the NHS as a governmental institution for development of tele-consultations is the strongest institution in Latvia.

8.7.2. Purpose and objectives

The aim of the NHS pilot project is to introduce the first telemedicine solution (tele-consultations) for primary health care in Latvia with further aim to organise bigger network for PHC specialists, to increase primary health care specialists knowledge, understanding and skills in rural areas and to increase treatment quality, safety, professional medical investigation and treatment. It is important to bear in mind that health economic gains from a national health care perspective as well as from an individual patient perspective.

8.7.3. Timeline

The NHS pilot started April 2012. Piloting will continue till end of January 2013. Mid-term evaluation was done in PrimCareIT Summer School on 2-3rd August 2013.

8.7.4. Participants

In NHS pilot are participating eight GP's from Latvian rural areas. Four of them work close to Latvia and Lithuania, Belarus borders. In order to facilitate numerations of tele-consultations the Pilots were named after their location. For example there are four pilots in Kurzeme - Ruba, Skrunda, Aizpute, Piltene, three in Latgale – Balvi, Dagda, Naujiena and one pilot in Vidzeme – Rujiena.

Two organisations were involved in provision of tele-consultations – firm Telemedica, who provides tele-consultations in dermatology and endocrinology and Latvian Society of Cardiology, who provides tele-consultations in cardiology.

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8.7.5. Evaluation methods

Quantitative – based on questionnaire. Two types of questionnaires were developed.

Qualitative - Interviews with GPs and consultation providers will be organised during WP 4 final meeting in January in Riga.

Questionnaires

Accordingly terms of the contract tele-consultation providers (Telemedica, Latvian Society of Cardiology, GP's who have consulted other pilot GP's) needs to fill in and submit the tele-consultation provided report and it needs to be submitted prior the fifth date of each month. But to assess the pilot's GP's satisfaction with both the benefits of technological solutions and with the content of tele-consultation in WP4 developed questionnaire is used. Accordingly terms of the contract pilot GP's needs to submit their questionnaires about all tele-consolations in the current month up to tenth date of the month.

Interview

First interviews were done during Summer school. The final interviewing is planned in final meeting with Pilots GP's was beginning of January 2014.

Tele-consultation modes (types of sessions)

Until beginning of December there have been totally 26 tele-consultations:

- 2 between GP's;
- 5 in cardiology;
- 10 in endocrinology;
- 9 in dermatology.

8.7.6. Technology and Technical equipment assessment

Eight Tablets are used to provide tele-consultations.

What worked and what didn't and why

NHS had problems with Tablets procurement and we leased them instead of buying. All 8 tablets have been transferred to pilot project GP's during the WP4 workshop in 15 March, when also the training in Tablets usage was organiser for pilot project GP's. Due to limited resources for lease of tablets – not the best but the most cost effective equipment was offered. Unfortunately there aren't lot of firms, who can offer such a service as lease of Tablets. During time of Pilots 4 of 8 Tablets needed to be changed due to technical problems.

8.7.7. Communication type assessment

Results from GP's questionnaire shows - 65% of all Pilots participant's admitted that tele-consultations were very useful, 20% considered that provided tele-consultations were quite useful, 10% reported that tele-consultations were mediocre, but 5% believes that their weren't so useful.

Information about satisfaction level with the functionality of the used technology during tele-

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consultations also was compiled. More than half of Pilot GP's – 55% were satisfied with functionality of used Tablets, 35% were even very satisfied, but 5% weren't satisfied and 5% weren't satisfied at all.

What worked and what didn't and why more why information

Pilot GP's are concerned about practical issues connected with Pilot, like need of better technical equipment (for example mobile cardiograph, that could transmit data to a computer), the amount of time what is needed for tele-consultations (average 10 – 30 minutes, but in case of complicated situation preparation of the application for tele-consultation may take up to one hour).

In the same time the positive aspects of tele-consultations are estimated - in certain cases they can successfully replace patient visit to the specialist. It was also clarified that tele-consultations for rural GP's aren't actual in case of acute patients, but they are very useful concerning chronic patient treatment or in case of unclear diagnosis.

United algorithm for tele-consultations was admitted as very necessary because it could facilitate work of GP's and save time of GP's needed for preparation of tele-consultation request.

As very important key factor for tele-consultation success was mentioned timely response receiving from specialist – no later than in one week. GP's must have the confidence that they will receive answer in time.

It is necessary to discuss about tele-consultation legal status, to clarify the division of responsibilities between the involved parts.

Need of time/support/development

Example: Pilot Ruba

Bus connection to Riga 3 times per day, cost EUR 5.34 per travel in one direction to Riga Travel time 3 hours

Bus connection to Saldus (not all specialists are working in Saldus) 4 buses per day cost EUR 2.35 per travel in one direction. Travel time 1h 10 min.

Compared to a situation in which the patient would be travelling (to one distant health centre), the save of the costs in the Ruba pilot sessions:

- save of time of travelling: 8 hours x 6 € salary/ hour = 48 €/ per person
- by bus saved € 13 (included travel in Riga)
- or by car save of costs of travelling: 130 x 2 kilometres x 1 pilot session x travel cost per kilometres 0.15 € (without depreciation costs) = 40 €/ per person

#Total saving for patient: = 88 €/ per person per consultation

8.7.8. Conclusion

During 2013, the working group established by Ministry of Health of Latvia developed Strategy of Primary Health Care for 2014 – 2016. In the strategy is written that GP has to work in close collaboration with specialists.

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Tele-consultations are seen as a perfect instrument to organise close collaboration.

9. General Conclusion

With hundreds of sessions concluded via the 7 pilot sites deployment within the PrimCareIT: project some results can be drawn:

Positive reflections

- Tools, methods and technology exist off-the-shelf, and built-into devices
- Fast and easy access to peers and specialists
- Improved security in assessment, treatment etc.
- Less travels
- Saves money and time
- Facilitates learning
- Possibility of patient participation at more meetings
- Nurses/nurse assistants can assist remote expert (improved use of trained staff)
- PHC workers are positive to technologies that improve their work
- Involving users in process speeds up deployment, and also brings new solutions to the table

Negative reflections

- Collegial dialogues still better in real life (if that is an option)
- Save cost on travels only if today's processes are changed
- Possible overuse of patients time
- Work satisfaction lowers if technology is not working
- Non-functional technology causes irritation
- Manuals, and "how-to's" needed for easy start

To enable new processes in PHC for use of tele-consultation it is important to involve early responsible IT-departments etc. since there are some negatives related to IT also:

- Start-up problems with technology (network, 3G, camera, audio, software, firewalls, etc.

This can be summarised as:

- Tele-consultation (dialogue) worked well (collegial tutoring)
- Technology must be "click-and-go"

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- The consultations must be integrated and scheduled in the regular work
- Tele-consultation is a valuable tool for supporting GPs in how to prioritise, treat and refer patients
- Key factor for success is timely response receiving from specialist, confidence of having access at right time

7 pilots implemented; all pilots measured attitude and experience changes turning the tele-consultation sessions. Information was collected in each participating organisation with a questionnaire and an interview. Pilots worked together in close cooperation and learned from the experiences of each other.

Pilots reported that tele-consultation helped to improve professional capabilities in remote areas. Participants felt less isolated and the self-confidence of making decisions and solving cases improved. Timeliness of response was positive and reduces travel needed (both patient and PHCW), possibly reducing costs.

Tele-consultation as a tool for counteracting brain drain was not seen specifically in the study but would be helpful tool for young medical personnel to work in the rural areas and still have access to peer network.

Tele-consultation is a modern approach and good tool to develop professional experience for medical specialists, improving especially younger specialists' capability to learn and stay empowered in the physical absence of more experienced peers.

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