



Central Union of Municipalities in Greece

«PROVIDING SUPPORT SERVICES IN THE DESIGN AND IMPLEMENTATION OF
PROJECT ACTIVITIES

**“Improving Healthcare Access through a Personal Health Monitoring System –
EHEALTH Monitoring”»,**

In the framework of the implementation of the "INTERREG V-A Greece -Bulgaria
2014-2020" Cooperation Program »



3. Supporting KEDE to actions to integrate project policies (wp3)

Deliverable 3.2.2: Policy Implementation Guidelines for achieving long-term objectives



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1. Introduction

E-health constitutes an integral part of European Union's (EU) strategy. According to research, it evolves alongside the fields of pharmacy and medicine. All the aforementioned categories are regarded as a new industry. E-health plays important role in achieving better development and creating new job positions that require even more qualifications, as long as a powerful economy depends on knowledge.

1.1 Definitions of E-health and Telemedicine

E-health consists of tools and services that rely on Information and Telecommunication Technologies and can improve prevention, diagnosis, treatment, monitoring and administration. It includes information and data exchange among patients and healthcare providers, hospitals, healthcare professionals, electronic health records, telemedicine services, portable monitoring devices of patients, surgical programming software, robotic surgery and basic research about virtual human physiology. Furthermore, it can produce benefits to a society, thanks to improvements of accessibility and quality of nursing, but also enhancement of effectiveness of healthsector.

E-health is an evolution of telemedicine. Telemedicine is described as computer usage and telecommunication networks in the field of medicine, and its goal is to facilitate distant healthcare provision. Telemedicine targets the following categories:

- Hospitals
- Health centers
- Private Medical Centers
- Doctors
- Nursing staff
- Insurers
- Patients
- Companies selling medical equipment
- Students (Universities – Colleges)

The basic needs that telemedicine addresses are:

- Remote areas with low quality medical services
- Navigation
- Home hospitalization
- Emergencies
- Health tourism units
- Advisory Units for doctors
- Tele-education
- Coverage of rare specialties
- Homogeneity of medical services

1.2. Mobile Health (m-health)

The tremendous dissemination of mobile technologies as well as advances in inventive application of these technologies in order to address health concerns have evolved into a new field of e-health, which is reported as ‘m-health’. This notion represents a medical and public practice which is supported by mobile devices, such as mobile phones, monitoring devices of patients and personal digital assistant (PDA).

This category also includes applications that might be connected to medical devices or through sensors (such as bracelets or watches) and personal guidance systems, information about health and drug reminders that are provided by SMS and also about telemedicine that are provided wirelessly. Solutions include various technological solutions which are important:

1. heart rate
2. the level of glucose in the blood
3. blood pressure
4. body temperature
5. brain activity

1.3. ‘EHEALTH Monitoring’ Project

‘EHEALTH Monitoring’ Project is incorporated into the Cross-border European Territorial Cooperation Program, ‘Greece – Bulgaria’, Priority Axis 4 ‘A Socially

Inclusive Cross-Border Area’’, Investment Priority 9a ‘’ Investing in health and social infrastructure which contribute to national, regional and local development, reducing inequalities in terms of health status, promoting social inclusion through improved access to social, cultural and recreational services and the transition from institutional to community-based services’’ and special goal 8 ‘’ To improve access to primary and emergency health care (at isolated and deprived communities) in the CB area’’.

The aim of the project is the development of an e-health monitoring system at a transnational level, which is based on Information and Telecommunication Technologies as well as personal non-invasive sensors. This system will provide remote monitoring of citizens’ health outside the traditional hospital environment and it will also create a permanent interconnection of citizens with medical staff. In this way, it will contribute to equal treatment and access of all citizens to modern health services, aiming at the social and economic development of an enlarged Europe.

Sensors and portable gadgets allow a constant and normal monitoring with reduced manual intervention and low cost. These sensors can be incorporated in garments, hats, socks, shoes, glasses, watches, headphones and smartphones. Most technological products use multiple digital health sensors. Some monitoring systems collect data and are connected to a remote location, such as a hospital server for further clinical analysis.

The system that is suggested brings personalized and economic health monitoring to all residents of the two countries. The strategic goal is the improvement of public health and quality of life, by adopting technologies which can adjust to citizens’ personal needs and concurrently, are of high credibility and low cost. The main goal of this project is the study, design and development of an innovative, user-friendly, portable, personal and at the same time low cost e-health system that can be used by everyone. This system will consist of a central information system and personalportable devices which will provide:

- remote monitoring of citizens’ state of health
- constant monitoring of patients’ compliance with their medical treatment
- live connection with medical staff

This report has to do with the execution of a study, which targets at policy guidelines development, in collaboration with other bodies in order to achieve the longevity of telemedicine system results. More precisely, it focuses on the achievement of a common philosophy and action plan which will increase awareness among the general public and will promote the use of telemedicine systems at a national level.

2. Current situation in Greece

2.1. Telemedicine Program

Telemedicine Program started in 1989 and it was a collaboration of Physics Laboratory of the University of Athens with Sismanoglio Hospital. After the appearance of positive results of experimental applications in 1989, Ministry of Health and Social Solidarity funded the installation of twelve telemedicine terminals in various regions in Greece. Moreover, since 1998 there are hospitals that use telemedicine in order to treat pulmonary diseases, cardiac diseases and hypertension, diabetes etc.

The specific Program heads to the direction of the provision of higher number of medical services, continuous medical training and therefore, creation of trust of the local population towards the primary healthcare that is provided. The international cooperation, since the beginning of the Program, provides the confidence that technological advances can be used in a fruitful way in the environment of telemedicine in Greece.

Telemedicine Program has set the following goals:

1. Support of medical staff of Health Centers concerning the provision of improved health services. In other words, it is about organisation, operation and technical support of a local node.
2. Ensurance of correct diagnosis. Health Center doctors can ask for the aid of experienced doctors of Sismanoglio Hospital in order to treat emergencies. It is apparent that a communication network among all doctors allows them to provide those services which are provided in big hospitals.
3. Provision of continual medical training. The existence of a communication network in order to provide medical treatment to different cases contributes to

the procedure of continual training as well as experience acquisition and monitoring of pre-planned courses that are based on a specific program.

In the last years, due to progress of programming, telecommunications and biomedicine, the field of telemedicine has developed significantly. High costs that occurred in 1960's and 1970's have been improved and in this way more and more people can make experiments with telemedicine systems. In Greece there is a high number of telemedicine programs (more than 50).

2.2. TALOS Program

The aim of this project is the design and development of a mobile medical device which allows tele-diagnosis, support of long distances and provision of advice to mobile health care units (ambulances, doctors of provinces etc.). Yet, it allows monitoring and provision of advice to boats, monitoring of patients at home from specialized doctors who work at a hospital or health center and the constant monitoring of patients who are hospitalized in Intensive Care Units (ICU), wherever the doctors are.

The system allows collection and transmission of important bio-threads (blood pressure, temperature, electrocardiogram) as well as collection and transmission of patient's images. These images provide doctors information about patients and in this way they can make a visual inspection. Telecommunication is achieved through different networks because it is ensured that communication is always present no matter how far a patient is.

2.3. Program of "EHEALTH" Laboratory

Ehealth laboratory was founded in 1985 and research and development (R&D) directions were chosen very carefully in order to be at the forefront of research in Medical Informatics. R&D activities of Ehealth lab turn their attention to development of innovative calculation methods and tools in four significant fields: e- health, m-health, Medical Imaging and Bio-informatics.

2.4. National Telemedicine Network

National Telemedicine Network was implemented by 2nd Health District of Attica funded by the "DIGITAL CONVERGENCE" Operational Program 2007-2013. The program started operating in early 2016 and it includes:

- 30 telemedicine doctor-patient stations located in distant locations
- 12 Telemedicine Medical Consultant Stations in big hospitals of the 2nd Health District of Attica
- 1 telemedicine medical consultant station in the National Healthcare Center
- A Data Center
- A Help Desk

2.5. Information System of the National Emergency Center (NEC)

This program aims at upgrading of national pre-hospital emergency response systems, by using modern information and communication technologies. It is a part of the attempt to develop an integrated telemedicine regional network in Crete and provides solutions regarding geographical monitoring of ambulances and mobile units, optimal use of available resources, capturing, transferring, analyzing and storing vital parameters with the possibility of remote monitoring of incidents and an electronic emergency record.

The Pilot Information System for Early Emergency Medicine of National Emergency Center in Crete consists of applications that serve Center's personnel and other health providers with whom it cooperates. More precisely, it contains the following applications:

- Application for voice mail and administrators at the guidance center of NEC allows the creation, completion and printing of the electronic 'Incident Card'.
- Applications for doctors at the guidance center of NEC, in collaboration with special subsystems in mobile units or a health center, gives the opportunity of telemonitoring based on vital parameters, electrocardiograms and video images transmitted by telemedicine from the place of the event.
- Application for NEC management uses advanced methods for data analysis from the incident file in order to support administrative decisions which concern hiring, training and day-to-day staff planning and purchase of equipment.
- Application for the crew of mobile units deals with receiving and sending the vital parameters of the patient from the ambulance to NEC guidance center.

- Application for ICU personnel and ER of hospitals as well as doctors at healthcenters which are under development.

2.6. Emergency Medical Assistance in the Sea

“MERMAID” is a program of medical assistance through telemedicine. It provides medical help and advice with respect to safety of those who work in the sea (eg. boats, naval bases etc.). 1,500,000 throughout the world are employed in activities that are related to the sea. The number of telemedicine calls from the sea is estimated between 15,000 and 20,000 a year for the whole world.

Communication technologies that have been used for MERMAID project can be divided in two categories: (1) transmission means and (2) networking systems. With regards to the former the following can be mentioned:

1. Optical fiber
2. Copper cables (HDSL/ADSL)
3. Communication satellites
4. Radio cell technologies
5. Wireless networks
6. Radiotechnology for navigation, on airplanes and trains

Similarly, regarding the latter it can be mentioned:

1. Asynchronous Transfer Mode – A.T.M.
2. Reference protocol model B-I.S.D.N. for A.T.M. or I.121
3. N-I.S.D.N.
4. The Internet

The present project uses telemedicine techniques that contain ‘live’ images of patients that are transmitted to doctors who are located in a remote area. In this way, there is the possibility of interaction between a doctor and a patient. Furthermore, communication satellites are a means of transmitting data between geographically isolated areas. Last, telepresence is the ideal presence of a person who is away and it can provide all the advantages of direct communication between the parties when telemedicine occurs.

2.7. Electrocardiogram at Home

It is about a service that is provided by the web in order to monitor patients from home. This application is used for collection of clinical data. A web browser allows access to patients' documents and E.C.G. data. The data comes from a database that exists for patients and it can be recalled and used. An 'intelligent' software is activated whenever new E.C.G. data is sent from home and this software can make comparisons between older and recent data. In this way, an optimal strategy can be created with respect to the aid that is provided to the patient, reports about their condition can be created, as well as suggestions in order for the problems to be faced.

Personal Computers which are used to make the E.C.G. measurements consists of a bus card, a protected E.C.G. cable, E.C.G. equipment and the suitable software for the safe monitoring of patient. The software was designed for Windows 9. Advanced graphics are used and user interface is quite specialized. There is a way of linking the database to the web. The language developed uses Open Database Connectivity (O.D.B.C.) and a web browser (Internet Explorer, Microsoft Corporation) plays the role of the client. This technology offers new and promising methods about patient monitoring when at home.

2.8. Renewing Health Remote Care Program

Renewing Health Program worked as a pilot in Thessaly and Central Greece, providing remote monitoring services to patients with chronic conditions, and in particular type 2 diabetes, cardiovascular disease and chronic obstructive pulmonary disease. In the first two cases positive clinical results have been observed with regard to interference through telemonitoring. The slow pace of technological innovation in health care has been demonstrated as well as obstacles such as complexity of the institutional framework, lack of compensation models and lack of interoperability in telemedicine infrastructures.

2.9. SmartCare Program

In the European Program 'SmartCare', there was participation from the Municipalities of Paleo Faliro, Alimos, Agios Dimitrios and e-trikala SA of Municipality of Trikala. The project concerned the development and integration into existing care structures, technologies about independent living of patients and the elderly at home with services such as monitoring of the physiological, environmental and behavioral

parameters of the patients, various self-care services, management of patients' medical treatment, prevention of accidents and practice of cognitive functions. According to project results, there were not remarkable alterations with concern to improvement of participants' health.

2.10. E-prescription in Public Hospitals

One of the most crucial reforms of our times in Health and Social Care affecting both public health and public finances is E-Prescription. This refers to the production, distribution and check of medicine prescriptions and referrals by using ITT in a way that ensures validity, safety and transparency of information.

This task has the following goals:

- Modernise the healthcare system
- Identify and deal with the parameters ensuring broad and successful operation
- Facilitate the introduction and utilization of E-Prescription practices in everyday process
- Creating a favourable operation environment based on transparency and broad acceptance and participation of involved parties in the relevant processes
- Showcasing and utilizing existing or under way relevant actions.

Out of all the doctors in the country's 131 hospitals, 10,000 are already in the system and 2,500 have been certified. Out of the country's 220 Health Centers, 3,000 doctors are in the system and 2,000 are certified. The aim is to connect E-Prescription with IT systems.

2.11. 'DELOS': District Health Network in the Cyclades (Phase A)

The project Creation of DELOS District Health Network in Cyclades (Phase A) pertains to the development and operational support of the Comprehensive 'DELOS' Information Health System for the A' South Aegean Health District, under pilot operation since the summer of 2006. The project aims to use ITT towards upgrading the quality of services, re-organising internal processes and providing better services to the citizens.

As part of this project, remote Health Centers and District Clinics are connected to large hospitals (support units) as well as to the Shifts Coordination Center-National

Health Operation Center. Each point is in communication with one or more others through ‘Syzefksis’ network. Tele-diagnostic services are provided since medical data can be transferred from the patient to the support center. Also tele-consulting is available, as is tele-medicine for emergencies, tele-training for doctors, nurses and administration staff, even tele-psychiatry services.

2.12. ACTIVAGE Action

European Committee ACTIVAGE project incorporates the Municipality of Larissa through ‘CitieNet AE’ inter-municipal development company along with the Municipalities of Veria, Volos, Grevena, Ioannina, Karditsa, Katerini, Kozani, Lamia and Trikala which holds the presidency of the Board. With this project, the European Committee aims to complete and enhance elderly care by means of new technologies.

More specifically, the European Committee officially introduced ACTIVAGE project, an initiative aiming to effectively deal with the challenges created by population ageing through solutions incorporating the use of new technologies. This is based on inter-connectedness, which in this case will try to make everyday life safer for the elderly by promoting an independent and socially active way of life and reducing the impact of chronic illnesses.

The Project involves 49 Organisations, 10 of which are in industry, 10 are top research centers or universities along with numerous large- or middle- to small-scale businesses from all over Europe.

2.13. Vodafone Program

The cooperation between Vodafone and Athens Medicine Center is certified by the Ministries of Health and Marine & the Aegean. The program includes the National Inter-Municipal Network of Healthy Cities- Promotion of Health and Vidavo firm and makes the best possible use of technology to apply programs supporting local communities and people.

In the 100 clinics participating in the Program visitors can perform basic preventive medicine tests, such as cardiogram or spirometry.

The Program also allows for the creation of a digital patient file in order for the GPs to have a better and more complete image of their patients’ health. Tele-Medicine Program promotes preventive medicine while also caring for the chronically ill, as it

allows for the systematic check of their health status at their area of residence breaking geographical or other boundaries.

Such an initiative is the Vodafone Tele-Medicine Programme, applied for the 13th consecutive year in 100 remote areas of continental and island Greece. The Tele-Medicine Program supports GPs while also promoting preventive medicine. It contributes to illness prevention through timely diagnosis while also caring for the chronically ill, as it allows for the systematic check of their health status at their area of residence breaking geographical or other boundaries.

3. Current legislation about Telemedicine and Ehealth

The basic legal framework governing the operation of telemedicine in Greece is Law 3984/2011. In particular, Article 66 (16) states:

‘Telemedicine services are provided as long as there is the possibility and with responsibility of the doctor who is accountable to the incident. The doctor, for reasons of personal data protection, is responsible to ask from the patient or when it is not feasible from a first degree relative, the signed authorization to use telemedicine services. If it not possible, the doctor uses telemedicine services based on his judgment. The instructions of Hospitals and Health Units providing telemedicine services are advisory and in no case mandatory’.

Law 3325/2014 refers to primary health care. This notion includes:

- Health services that do not require admission to a nursing home
- Family planning
- Infrastructure necessary to secure and manage all medical information and population data
- Assessing the health needs of citizens and designing and implementing measures to prevent disease and promote health
- Social care services

This Law ensures that all citizens have access to a sufficient system of primary health care that aims at social integration and development. Furthermore, a personal and family doctor is introduced. This legislation mentions the electronic file as well,

pointing out that every health center and dispensary established full infrastructure about keeping and updating the details of the electronic file.

At European level, on March 9th 2011, the Directive concerning patients' rights in cross-border healthcare was introduced. It points out that access to high quality of cross-border healthcare is facilitated by 2011/24/EU Directive and cooperation in the field of health among the members of EU is promoted. Article 14 is referred to e- health. It mentions that the goals of the e-Health Network have to do with the collaboration with respect to production of economic and social benefits of European systems, services and e-Health applications in order for a high level of trust and safety to be achieved. In this way, care is enhanced and access to safe and high quality of healthcare is ensured.

The objectives of the Health Technology Assessment Network have to support the cooperation between national authorities, provision of objective, reliable, comparative and transferable information to member – states, information analysis that is exchanged as well as repetition avoidance. However, in order for all these to happen, this network has to receive help from the EU.

4. Telemedicine Technology Requirements and Tools Used

E-Health includes tools and solutions for professionals, patients, administrative services, personalized systems for citizens and patients, web platforms and intelligent systems that are integrated in everyday activities, clothes, portable devices and health gates. Apart from the aforementioned systems, there are more integrated systems which help prevention, diagnosis, treatment, monitoring and the wider management of a healthy lifestyle.

'Help4Mood' project has been developed in order to combat depression from home, using personalized monitoring systems. 'INTERSTRESS' project aims to develop innovative solutions, based on Information and Telecommunication Technologies, in order to address the problem of psychological pressure in professional and social life. In this project a combination of technologies (virtual reality, non-invasive biosensors and tools to prevent and manage stress) is used.

'Big White Wall' is a project that focuses on timely intervention of people with mental disorders but so is 'Medixine' that has to do with the interconnection of patients, their families and healthcare providers, by using online platforms. 'Home

Care' project includes an answering machine which is placed at patients' house and gives messages from doctor's PC, reminding the patient about the dosage and time that they have to take their medication.

Automated hospital systems consist of data collection and processing systems. These systems concern the following:

- Picture Archiving and Communication System (PACS)
- Pharmacy Information System (PIS)
- Anesthesia Information Management System (AIMS)
- Laboratory Information System (LIS)
- Radiology Information System (RIS)
- Hospital Information System (HIS)

5. Areas of Interest of Telemedicine

Initially, access to rural communities and disadvantaged populations keeps being regarded as the driving force of telemedicine. By 'disadvantaged populations' we mean the elderly, disable people, people with mental problems or chronic disease. Greece has many remote areas (islands and mountainous areas) where hospitals are not easily accessible. Telemedicine can offer services to these areas by providing the appropriate infrastructure and solutions to lack of specialized medical staff.

Apart from the aforementioned population groups, e-health and telemedicine focus on prevention. For instance, nowadays there are thousands of applications that promote a healthy lifestyle. These applications can increase users' health in relation to physical condition and weight loss.

6. Benefits of Telemedicine and Needs that are covered

Regarding *doctors*, this method produces many benefits. Firstly, it can make a diagnosis when a patient lives in a remote village and ask for the opinion of a specialized colleague. Going further, there is direct access to patients' record, reduction in time of diagnosis, direct information and communication with colleagues through the network. *Employees* in health centers and hospitals can use new technologies and their job can be facilitated to a high extent, increasing the efficiency

and reducing the time spent on an incident. Therefore, productivity is enhanced, mistakes are reduced and sense of security for patients and health professionals increases.

Communication time between hospitals is drastically reduced, there is an upgrade of the provided health services at the level of local government and there is also a wide coverage of medical incidents. Finally, the working environment of medical staff has been modernized with the use of technology and services based on international standards, as well as training of doctors are facilitated and upgraded.

Concerning *citizens*, benefits are related to direct contact with the doctor, even if they are miles away, immediate service and increase of care by avoiding repetitions, delays and mistakes. Information about public health issues, epidemics and prevention are of significant importance, as well as reduction in the cost of care without unnecessary expenses. Telemedicine and information systems enhance transparency.

In addition, some other benefits that can be generated have to do with savings on examination costs, reduction in the geographical and physical isolation of patients and the elimination of the internal migration to urban centers in order to receive better and more effective medical care. The ability to provide expert advice from overseas and improvement of day-to-day research are at the top of the pyramid.

The fact that there is quick and direct access to new information contributes to support of diagnosis and treatment, including rehabilitation. E-health applications can constructively help in the management of health units through the dissemination of best practices. The use of applications of telemedicine (tele-consultation, tele-care or tele-monitoring) and health care at home facilitates and enhances people's stay in decentralized areas, improving the overall provision of health services at each level.

7. Difficulties in Telemedicine application

The Greek Health System is characterized as mixed, which combines social health insurance and the National Health System which is centrally funded. Multiple reforms have been made since 2010, but health sector is still characterized by a high degree of concentration. Furthermore, the appalling financial crisis that broke up in 2008 keeps affecting the Greek health system. High private health expenditures, mainly in the form of direct payments from patients, have always been an important feature of the Greek health system and are still rising.

In Greece, all resources are distributed to public and private hospitals and health centers, but facilities, personnel and medical equipment are unevenly distributed. In fact, there is high concentration in urban areas and the service which is provided in rural areas is really poor. Additionally, in 2010 there was a reduction in the public sector recruitment and this affected health sector to a high extent.

Going further, cost is considered to be the most common cause of the application of telemedicine. This parameter affects both citizens and medical staff. For instance, due to income collapse citizens are not capable of paying for private services and hospitals are not able to buy equipment because the price is really high. There are also problems because of the high degree of bureaucracy. Unemployment is another issue that plagues Greece. Since 2010 there was a constant reduction in employees' salaries in order for the cost to be decreased. This particular fact creates concerns regarding the adequacy of health system funding, especially in the long-term.

All these obstructions can be found at European level as well. European countries face increased demand concerning health services due to the aging population, high income and education level. Adequacy of health system financing is a cause of concern due to the pressure that is exerted on public spending and as well as high percentage of private expenditure. One of the major obstacles is the lack of interoperability in e-health systems. Lack of interoperability restricts the use of the existing solutions and discourages their adoption from users.

Another important issue is the right use of Information and Communication Technologies in order for the patients to be informed in the right way. Most of the time, patients have already searched online about their symptoms and unfortunately, they have started taking medication on their own. Therefore, the internet has to be used in a proper manner in order to receive the benefits and avoid any undesired consequences.

The elderly are not very familiar with the internet and technology tools in general, consequently they might be incapable of receiving the benefits that are produced and we should bear in mind that these people suffer from health issues. Finally, lack of a common regulatory framework and legislation, but also the problem of non- friendliness of the final application are regarded as significant obstacles.

8. Suggestion of Best Practices Implementation

8.1. Electronic Medical Envelope

Electronic Medical Envelope of patients is one of the best five practices of e-health all over the world. More specifically it supports:

- ✓ Creation of medical history
- ✓ Future problem prevention
- ✓ Detection of deviations from normal trends
- ✓ Collaboration on patients' treatment
- ✓ Automated sending of medical records and information
- ✓ Personal data protection
- ✓ Common guideline development
- ✓ Clinical research

In Czech Republic 'IZIP' program has been developed. It is about a patient medical e- file system accessible through the network. The pilot version of IZIP was introduced in February 2002 in four selected regions of the Czech Republic: Benesov, Beroun, Jicin and Rokycany. It contains all relevant information for the citizens' contacts with healthcare services, such regular visits to a pathologist, dental treatment, lab and imaging exams, operations etc. IZIP system allows doctors access to the patient's e- file whenever they consider it is advisable, so that each doctor can know about his patient's background and provide him with the most suitable treatment or be able to resume an interrupted treatment.

The IZIP's main goal is to turn the medical database from isolated healthcare professionals and healthcare providers to the insured citizens. This is achieved by replacing the printed forms with safe digital records on-line. Citizens can access their files but they cannot alter the registered information.

8.2. Help4Mood

This project's main goal is to develop a system that helps people who suffer from depression in order to recover at home. A final application has been designed and used in combination with other forms such as self-help, advice and medical provision.

This method has been implemented in the United Kingdom (Scotland), Romania and Spain. Results have shown that half of the participants used the system on a regular basis; however none of them used it on a daily basis. Despite that, most of them declared that the system met their needs.

8.3. INTERSTRESS

This project aims at the development of innovative solutions based on Information and Communication technologies in order to combat the issue of psychological pressure in professional and social life. The final solution includes a combination of new technologies, such as virtual reality, non-invasive biosensors and mobile tools for prevention and stress management.

It has been implemented in Italy, Spain and Germany and targeted teachers and nurses. This selection was made due to the fact that teachers and health professionals suffer from extremely high levels of stress and anxiety. Results have shown that virtual reality can be more effective in stress reduction in a controlled environment, sensors are useful at objective stress measurements, mobile phones are useful in order to control stress and finally, sensors usability / portability improvement is the key to control stress levels.

8.4. Big White Wall

This platform is an online service of early intervention for people who suffer from psychological disorders. It combines social network with a function of clinically up-to-date interventions to improve mental well-being. According to platform members, one of the most important parameters is the fact that they can speak freely, while being anonymous. They use images and words in order to create vivid and expressive ‘bricks’ that are posted. Going further, they can share and discuss images subjective history and express their opinions. This application has received many awards such as the Best e-health solution created by an EU SME 2014.

8.5. Diabcarnet

Diabcarnet is an online diary which is used for diabetes monitoring, especially among young people. It is about a site with a user-friendly environment and it has been developed to allow the monitoring of treatment of people with Type 1 diabetes. Patients and doctors have to be assessed in order to use the service. Diabcarnet has

allowed more than 9000 patients with diabetes to have more personal freedom through this remote monitoring process.

8.6 Sweden: SJUNET Healthcare Network

SJUNET is a broadband network based on IP network protocol supporting communication among healthcare providers. It was firstly introduced in 1998 as a local network in Upsala but soon evolved into the country's National Healthcare Network. Today, all hospitals in Sweden, health centers and healthcare stations are connected to this network.

Technically, SJUNET operates independently from the internet thereby safeguarding the exchange / transmission of data, such as patients' personal information. Most ITT applications of the SJUNET pertain to tele-medicine.

8.7. MedicalORDER Storage & Restocking System (Germany)

The system was first introduced in St. Franziskus hospital in Munich in 2001. Today, about 90% of documentation and most medicine are stored according to the standardized MedicalORDER system. This standardization of hospitals' supplies leads to easier and more cost-effective administration, while greatly reducing the cost of supplies as it allows mass orders depending on the demand. Although the system is designed for the optimization of processes, patients are also benefit. The time earned by nurses due to the less work they need to do on administration issues, such as checking the medicine storeroom and placing orders, is spent on patients in greater need of care.

8.8. Danish Health Data Network-DHDN (Denmark)

The Danish Health Data Network (DHDN), developed by MedCom, was introduced in 1994. It is a long-term plan allowing the effective transfer of data among various healthcare departments, thereby enabling all people involved in healthcare to communicate more efficiently and reliably. It starts from the patient early care. It provides numerous services to citizens, such as access to pharmacies, hospital diagnostic services, specialized consultation, hospital referrals and home care.

8.9. Healthnet Healthcare Information Center (Finland)

HealthNet is a tool enabling pure cooperation and incorporation of primary and secondary healthcare units. It was introduced in rural Finland in 1997. This network

connects 15 health centers and 1,340 work stations in the region. HealthNet software allows doctors and nurses in hospitals, health centers and private clinics to produce files and safely exchange patient digital files from within the unit or among different units. Data transmission is fast and abides by the strictest safety regulations. Digital signature of the documents is a separate element incorporated in HealthNet.

8.10. Thrombosis Digital Logbook (Netherlands)

Thrombosis Digital Logbook in the Netherlands is a medical monitoring system from home by means of suitable equipment and a network medical file for the patients and the healthcare professionals. This digital logbook provides medical background and thrombosis services thus enabling patient monitoring. This entails registering new blood rates under the used protocol and the new dosage. It also allows direct adjustments which can be communicated to the patients. Patients can conduct their own blood tests at home while Thrombosis Services retain medical responsibility. Since 2002 equipment costs are covered by country's insurance funds.

8.11. NeLH (United Kingdom)

NeLH is a digital library consisting of approved quality databases that offer high levels of medical information resources. This is available as a Web service, using an Internet provider and a search application to allow the user to seek information and knowledge pertaining to his condition. The service is available to the UK's National Health System since November 2000 and has been proven to be very successful. The service is available to all NHS healthcare professionals, as well as to clinical doctors, nurses and GPs.

It is also available to patients and members of the public. The most significant criterion is the provision of information and knowledge both accurate and current. In brief, NeLH aims to facilitate access to contemporary information and know-how while improving healthcare and clinical practice. NeLH has managed to optimize and simplify library contracts by reducing supply time and cost. It makes the best possible use of hard-to-find health resources by reducing time spent accessing knowledge, demand for public healthcare and promoting a healthier lifestyle while also increasing productivity by offering an adjusted search engine.

The recommended best practices are extremely important in order to achieve the longevity of telemedicine results at a national level. Some of them are already used in

Greece, but there others that have to be implemented as well, as they are successful in other countries. In this way e-health notion and its role will be upgraded. It is also imperative that different sectors will cooperate. The European Commission and members of the EU can collaborate in order to produce beneficial results. Moreover, local and regional bodies in each country, as well as public and private bodies, such as local government with doctors and academics will promote the implementation and dissemination of best practices.

9. Awareness Raising and Communication

The first step regarding information about telemedicine and e-health is a campaign which will be carried out in the cross-border area. Its target is mainly old people, people with chronic conditions etc. The main goal is to induce citizens to use the telemedicine application through the creation of a special printed material. Transnational and local events are also a useful method. A site has also been created as well as social media accounts (facebook, instagram, twitter and youtube) and visitors can be informed about project's goals, events, action plan and project results.

Communication to the public will be achieved through printed material which consists of two leaflets, a poster and a banner. Furthermore, public awareness can be carried out by press release, e-newsletters and the internet. Last, local and national media will enhance information sharing and will raise awareness.

10. Conclusion – Final Action Plan

The main goal of the project is the design and implementation of an innovative, user- friendly, adjustable, personal and low-cost e-health system for everyone. Improving the access to healthcare services through a personal monitoring system will lead to a permanent connection with doctors. In this way there will be fair access to healthcare system and this will contribute to the EU's social and economic development.

E-health sector is wide and it contains sites, applications, systems etc. Telemedicine development is a challenge and there many obstacles when trying to apply it. If there is collaboration between medicine and technology this will be overcome. The EU can contribute to this by raising awareness and providing funds for e-health. Interoperability should also be addressed by exchanging data about health.