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-AGreece - Bulgaria 2014-2020" Cooperation Program »

Deliverable 3.2.1: Good Practices identification & assessment

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1. Introduction

The term 'best practice' is used to indicate a tested process or action practically proven to be more effective than others when applied under specific conditions. Such **Best Practices** are meant for the Municipalities, their better organizing, to be directly applied after the necessary adjustments with the aim of better fulfilling a given local need. They are best practices because they introduce innovation, yield results, are sustainable, can be 'copied', are transferable and easy to utilize. The term 'good practices' or 'best practices' or 'effective practices' is used to indicate a tested process or action practically proven to be more effective than others when applied under specific conditions.

According to the European Union, the main characteristics rendering a set of practices 'best' are the following:

- ***innovation***, when a new creative solution is proposed which is also accompanied by a realistic implementation policy,
- ***effectiveness***, as the proposal is actually feasible,
- ***sustainability***, proven by how long the results last,
- ***easy reproduction***, implementation under similar or identical conditions, and
- ***transferability***, more specifically implementation in different environment by new users who want to adopt the practice.

Good practices offer tips, guidelines, techniques or methodologies whose implementation can lead to greater safety and reliability in a desired outcome.

Each Municipality's vision is to create a strong organization, standing by its citizens, ready to fulfill their needs. By upgrading the services through the wide use of IT technology, broadband and wireless networks and promoting the citizen's interactive role by giving them the chance of direct communication, information and

participation in decision-making, the Municipality can generate a very positive momentum for local development and overall prosperity.

By upgrading the services provided through the extensive use of information technology, broadband and wireless networks and promoting the interactive role of the citizen with the ability to communicate, inform and participate in the decisions that concern him, the Municipality is able to develop an excellent positive dynamic profile for local development and the general well-being of its citizens.

2. E-health and Public Health

Over time, we see all the country's Municipalities planning ever more telematic applications, using EU funding and making the best use of broadband technology, IT and communications know-how.

The Municipalities already offer care services at the Open Care Centers for the elderly, through home assistance or in the Municipal clinics. Applying Information & Telecommunications Technology (ITT) in health services is a very promising attempt to deal with the problems created by the increase of the average age, reduced family care and the reduction in working population.

The aim is a more effective management and provision of social and health care through ITT, thereby reducing the time spent in institutions and hospitals, increasing time spent at home and improving the quality of life of the elderly and disabled, people with mental issues and the chronically ill. A recent study for the EU aiming to determine the depth of ITT application in Europe, America and Japan identified two main field of applying said technologies: telecare, referring to the provision of home social care and home telehealth, referring to the provision of home health care.

2.2 Tele Care services

Tele-care services are divided into:

A) Personal alarm systems (first-generation tele-care) that have been in operation since 1980 and allow elderly people and people with disabilities to send help calls through a portable device. Calls are directed to a center, which then communicates with family members or calls for immediate help. Personal alert systems are usually provided as community (municipal) or private enterprise services.

B) Second generation tele-care, which carries a series of upgrades compared to the 1st generation. The use of drop, motion, smoke, temperature, etc sensors allows automatic call for social care services in case of need. Second-generation tele-care is based on personal alarm system infrastructure with additional teleconferencing services.

C) Third-generation tele-care, based on new emerging ICTs with the ability to identify potential user problems before they even appear and intervene proactively. Such systems use sophisticated methods of tracking and identifying occupant behavior and activity.

2.3 Tele Health at home

Tele-health, as mentioned above, uses ICT to provide medical care to home users (and beyond). It includes tele-monitoring, teleconferencing and counseling services, remote rehabilitation, as well as self-management health promotion devices. More specifically, the applications and services of the above-mentioned method include:

- Tele-monitoring: remote measurement and monitoring of specific human bioassays and indicators such as: blood pressure, blood glucose levels, electrocardiography, etc.

· Teleconference: providing online (phonetic) or video-based consulting services (medical) by qualified medical staff. These services can be provided either in case of need or in the context of a complete package of services.

· Tele-recovery: provision of rehabilitation services to patients through the use of the Internet, network cameras and telecommunication networks. The majority of these services fall into two categories: assessing the patient's clinical status in his / her place of residence and subjecting the patient to treatment. These services are useful in patients who are unable to be hospitalized in a clinic due to physical weakness, long distance, high cost, etc. Areas where such services have been implemented are: neuropsychiatry, otolaryngology, physiotherapy etc.

3. What is Tele health and care

The term telehealth originates from tele-medicine and tele-care. Telehealth is an emerging field crossing the scientific areas of medicine informatics, public health and business research with respect to the provision of health services and data by means of the internet and relevant technologies. Telehealth is expected to form a significant part of the total European market of information and telecommunication technologies in health.

Even more development is expected in the long term since the use of telehealth services accelerates and becomes more widespread. As a result, telehealth services in home support and monitoring are internationally proven to significantly contribute in better managing these groups while at the same time reducing the ensuing health costs.

The standard home support and care telehealth services for the elderly include:

* 24/7 Telehomecare -monitoring and patient support

* Medication compliance management

* Identification and management of emergencies through smart devices and movement detectors, fall detectors etc. (smart home)

* Remote video visiting

* Diagnostic monitoring.

The term 'e-Health' covers a wide range of tools based on the information and communication technologies aiming to better diagnose, treat, monitor and manage health and way of life. The term also includes all Telematic applications (the combination of information and communication technologies) in health care, cooperation and information exchange between patients, healthcare organizations and institutions as well as communication among patients or healthcare workers. It also includes information networks on health, digital health records, tele-medicine or personal communication systems (mobile) for the patients' monitoring and support.

E-health applications provide access to health information which could have significant benefits for the entire population by improving the quality of and access to healthcare. Furthermore, they contribute to developing healthcare systems aiming to fulfill the citizens' needs, improve healthcare effectiveness, efficiency and sustainability. Given the ever-increasing mobility within the EU borders and beyond, the role of e-health mainly in terms of saving human lives becomes all the more important.

4. EU Objectives

The EU co-ordinates the creation of a "European e-Health Area" by promoting and directing actions and practices that foster co-operation between eGovernment-competent eGovernment policies with the aim of finding the most meaningful

solutions, dismantling (as far as possible) of the fragmentation of health services and the dissemination of "good practices".

Its aims are the creation of an integrated system of electronic health records with corresponding support for the exchange of information and standardization, the creation and promotion of networks for the exchange of health information between health care and care institutions and organizations in order to coordinate actions in the event of risk of public health, the provision of on-line health services such as information on a healthy life and disease prevention and finally the development of televisual systems Treaty (teleconsultation), electronic prescribing (ePrescribing), electronic referral (eReferral) and electronic reimbursement of medical expenses.

In order to succeed, it's indispensable to take into account the needs of citizens, patients and health professionals and, at the same time, to ensure their participation in the implementation of relevant plans and strategies.

5. E-health –Actions and Best Practices in Greece and abroad

5.1 E-health systems in Greece

'Best Practices' in Health constitutes seeking and applying the methods and processes which ensure the best possible results in the least possible time at the least possible cost. This definition identifies **four properties** of a 'Best Practice" applied to promote health:

a. The scientific accuracy of the method or technique compared to other similar ones

b. The method's suitability for the specific purpose

c. The method's effectiveness compared to others

d. Its efficiency in relation to the resources and time.

In the field of medicine, finding the most validated, suitable, effective and efficient method is neither obvious nor easy. It requires a process of constantly evaluating current scientific knowledge and ever-produced new scientific data, the sheer volume of which renders said evaluation extremely difficult. These concerns led to the development of a series of techniques aiming to find the best practice for each case with the best scientific validation in terms of effectiveness.

The following chapters provide indicative examples of best practices and e-Health system strategies used in Greece as well as in Europe in general.

5.2 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:

· Modernize 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 favorable 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.

5.3 '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-organizing 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 provides 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-psyciatry services.

5.4 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.

5.4.1 Technological applications in healthcare through Vodafone network

The cooperation between Vodafone and Athens Medicine Center is certified by the Ministries of Health and Marine & the Aegean. The programme 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 programmes supporting local communities and people.

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

The Programme 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 Programme 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 Programme 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.

6. E-health systems in Europe

6.1 Estonia: Digital Prescription

'Digital Prescription' was introduced in Estonia in 2010. The aim was for every doctor and every pharmacy in Estonia to be able to use e-prescription. The programme includes numerous partners such as government bodies, hospitals and pharmacies. It has already enhanced transparency in medicine prescription and plays a great part in data collection, improving healthcare and decision-making among the policy bodies.

E-prescription is conducted through a computer via the suitable software. Thus, information can be directly sent to the national database and the prescription is accessible by every pharmacy after a request by the patient.

6.2 Germany: MedicalORDER Storage & Restocking System

The system was first introduced in St. Franziskus hospital in Munich in 2001. Today, about 90% of documentation and most medicine is stored according to the standardized MedicalORDER system. This standardization of the hospitals' supplies leads to easier and more cost-effective administrational organization, while greatly reducing the cost of supplies as it allows for mass orders on demand. Although the system is designed for the optimization of processes, patients are also benefitted. 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.

6.3 Denmark: Danish Health Data Network-DHDN

The Danish Health Data Network (DHDN) developed by MedCom was introduced in 1994. It is a long-term plan allowing for 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 the citizens with numerous services such as access to pharmacies, hospital diagnostic services, specialized consult, hospital referrals and home care.

6.4 Czech Republic: IZIP Medical E-File

This is one of the five best E-Health practices in the world. IZIP is 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 advisable so that each doctor can know 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.

6.5 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 of Sweden's hospitals, health centers and healthcare stations are connected in 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.

6.6 Slovenia: Health Insurance Card System (HIC)

The Health Insurance Card System (HIC) was introduced by Slovenia's Healthcare Department in 2000. The HIC provided Slovenia's Healthcare System with digital files for all insured persons and created data connections among all insurance and healthcare providers. The system combines smart card technology and network services and includes the following tools: micro-processor cards for the insured party (HIC) and the healthcare professionals, environment to process healthcare providers' data and a direct (online) network of personal service terminals (SST). Health insurance rights can only be applied via the HIC.

The card alone or in combination with local and remote databases provides accurate data throughout the healthcare system. HIC system includes the registration of personal doctors (GP, dentist and gynecologist), allows healthcare workers to automatically fill in subscriptions and facilitates the registration of medical technical assistance devices.

6.7 Finland: Healthnet Healthcare Information Center

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, file and safely exchange patient digital files from within the unit or among different units. Data transmission and fast and abides by the strictest safety regulations. Digital signature of the documents is a separate element incorporated in **HealthNet.**

6.8 Netherlands: Thrombosis Digital Logbook

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 for 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 the country's insurance funds.

6.9 France: Diabcarnet Digital Logbook

Diabcarnet is a network digital logbook used to monitor diabetes, mainly among the young. A user-friendly webpage allows patients with type I diabetes and specialized doctors to monitor treatment and progress. A custom-made digital logbook is daily filled in with the blood and urine data, insulin type and dosage.

Any signs of hypoglycemia or sudden sugar level increase is registered and a final report identified any necessary amendments to the treatment. The system also allows the patient to consult with his doctor via e-mail regarding how to manage his situation. Both doctors and patients must attend a training programme in order to use the services. So far, Diabcarnet has given more than 9000 diabetes patients more personal freedom through the remote monitoring process, ensuring that due dosages are supplied.

6.10 UK: NeLH Digital Library

NeLH is a digital library comprising databases of approved quality assessed as offering high level 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 proven 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 the patients and the 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, reducing demand for public healthcare and promoting a healthier lifestyle while also increasing productivity by offering an adjusted search engine.

7. Conclusions

As demonstrated by the above practices, E-Health systems have started playing a significant part in promoting public health and healthcare in almost the entire Europe. Applications such as E-Prescriptions and Information Health Systems are the main pillars for the smooth operation of healthcare by actively improving the level of medical services provided to the citizens. The promotion of E-Health goes hand in hand with the development of new technologies and a country's network infrastructure. The massive technological development of the last decades combined with the increased demand in medical services (e.g. higher life expectancy) are crucial factors in the promotion of E-Health. It is now clear that new technologies have evermore applications in health and create more favourable conditions for the provision of medical/treatment services, with the internet playing a great part as demonstrated by the practices already applied.

Applications such as Information Health Systems and Tele-Medicine give rise to a new era in health with significant benefits both in healthcare provision as well as in organization. Effectively incorporating e-Health applications and support services could improve people's quality of life by allowing safe, independent living and

increasing socialization while also reducing social isolation. E-Health allows access to healthcare data which can promote a healthier lifestyle by contributing to basic healthcare challenges for the current European systems (such as effectively preventing disease) which in turn leads to a reduction to healthcare clinical expenses. These decisions are necessary for the healthcare system and all its functions to be both cost- and socially effective.