

# DEVELOPMENT OF THE PRELIMINARY MODEL OF HEALTH AND CARE SERVICES FOR FRAIL ELDERLY

---

**Deliverable D.T1.3.2**

**Version 1**

**12/2020**

---





## Content

<b>Introduction .....</b>	<b>1</b>
<b>Executive summary .....</b>	<b>2</b>
<b>1. Good practice from Emilia Romagna region .....</b>	<b>3</b>
1.1. The origin of eCare .....	3
1.2. The current eCare .....	4
1.3. Brief description of the original good practice .....	4
1.4. The technological and organizational background of the e-Care Service .....	5
<b>2. Monitoring grid .....</b>	<b>6</b>
<b>3. AP NURSE .....</b>	<b>7</b>
<b>4. GPS tracker .....</b>	<b>9</b>
<b>5. Online sleep monitoring system .....</b>	<b>11</b>
<b>6. Method of care of patient discharged from hospital .....</b>	<b>12</b>

## Introduction

Along with the development of strategies for preparing for an aging population, there are also opportunities for using technologies to reduce the risks arising aging od population. The development of these technologies is taking place all over the world, a large part is also taking place in Europe. In 2016, 19.2% of the EU population was aged 65 or over. The share of the elderly in the population differs considerably between Member States. In 2016, the highest share was recorded in Italy (22.0%) and the lowest in Ireland (13.2%). The great practice in developing strategies and ways to reduce the risks of an aging population is in countries where they have been facing a high proportion of elderly in the population for a long time. The Italian region of Emilia Romagna is one of them. That's one of the reasons, why good practice (GP) from Emilia Romagna region was chosen to work with.

The Ecare Network of Bologna, active since 2005 and created by CUP 2000 (now Lepida) on behalf of the Bologna Local Health Authority and 50 municipalities in its district with the support of the Emilia



Romagna Fund for not self-sufficient people, has formed a network of social services and community groups (citizens, associations, public authorities and professionals) to support the frail elderly.

The e-Care contact centre talks to 1 500 frail elderly a year. Those people are over 75 years old, live alone and are considered frail because of health or social conditions. Contact centre operators call them every 7 or 10 days, depending on their frailty level. During the calls, operators collect information in order to check on the daily status of the patients and update their files.

To find out frailty level of every individual, e-Care adopted the English method to calculate Frailty Index (0-100%). More than frailty index adopted by LHA BO, Bologna municipality started a professional education for social assistants to improve their comprehension of frailty's phenomenon. Retired trade unions stopped to ask for beds in nursing home residences. They started to understand how much is important to prevent severe ageing also improving and reinforcing home services. From 2011 sociologists and statisticians denounced the growth of elderly in our country but operators and associations were not ready to change their behaviour, running activities and expectations. Without the community projects we could only phone to elderly, and they could only watch to television. People over than 75, retired from work 10 years before, are isolated, without digital knowledge and they lose relationships progressively.

From 2011 Lepida and LHA BO tried to build a mix between the Welfare State and Welfare Community, with the aim to realize Web Communities. The first contact of a senior with the e-Care contact centre is often suggested by social assistants, nurses, general practitioners and volunteers. During the first phone call with the senior, e-Care operators explain the services and interview the client in order to collect information not only about his/her health status, diets, medications, past hospitalizations and outpatient visits, but also about relatives, friends, personal interests, preferences and personal skills. This information is then recorded into the personal file of the e-Care patient, so that the operators can later adjust each phone call according to the personal needs of a particular patient. They can provide help with transport, socialization, assistance, groceries, friendly visits, but also offer counselling in specific situations, e.g., abuse or mistreatment by relatives or neighbours.

The aim of this care is to enable elderly people staying safe and comfortable in their homes as long as possible. All the tools developed in this project are achieving the same goal.

## **Executive summary**

Following the previous outputs, preliminary versions of models for frail elderly were created based on the practice from Bologna, which was chosen as the most suitable for the transfer of good practice. Each of the models follows the GP based on the issues addressed in their locality.



Six solutions are being developed within the project. In this document, we describe the individual initial models and their connection to GP from Bologna (Emilia Romagna region). Based on the needs of BUT Brno, partners from BUT are developing an online sleep monitoring system that will be used for cheaper and therefore more accessible early detection of onset dementia and Parkinson's disease. Partner from Slovak University of Technology in Bratislava will develop monitoring tool for patients suffering from Alzheimer's and Parkinson's disease for home and medical application. GPS tool is going to be developed by Lepida SCPA. Institute for elderly and shelter will work on tool YBOSS. Partner no. 8 - Samaritan Vienna Department of Home Care will modify Frail Index, one of pillars of eCare, into tool called Monitoring Grid and University Hospital Olomouc will work on platform for patients discharged from hospital.

## 1. Good practice from Emilia Romagna region

### 1.1. The origin of eCare

Since 2005, a new experimental service, called eCare Network, was started, focusing on a sample chosen among all the 50 municipalities catered for by the Local Health Authority of Bologna. This service was addressed to frail and/or lonely elderly people, through the setting up of a network providing support to already operating services, according to the subsidiary principle. This experimental service was introduced also following the events that occurred in Italy in summer 2003: an exceptional heat wave with high temperatures, lasting unabated for over two months, caused the death of a much higher percentage of elderly people than the average seasonal trends. For the first time, these events caused resounding echoes within the public opinion and raised the awareness that it was not enough to provide a protection and prevention network for those brackets of population at highest health risk during very hot periods. These events also highlighted that the lack of knowledge of potentially available services specifically designed for senior citizens, living at home alone and not being fully informed about them, constituted exponentially growing risk factors of incurring serious or irreparable emergency situations.

The project was promoted and coordinated by the Provincial authority of Bologna. It was intended to test a relational model with citizens that would be able to promote accessibility, transparency, usability and operational efficiency of social and health services. It was a very innovative service at that time, aimed at providing eCare services to (over 75) senior citizens living on their own, already known by local social services, but not yet users of public services.

The project was primarily designed to follow up over 75-year-old people living alone enrolled in the trial, through periodic calls made by a specialized Call Center, to detect early signs of deterioration in their social and health conditions, especially during particularly adverse weather events (long-



lasting excessive snow, frost and heat waves, etc.). This action was aimed at promoting their stay at home, within their own social and housing environment, thus allowing them to delay access to costly senior housing facilities, to reduce their hospitalization and length of stay, also using solidarity social networks.

The project was thus intended to improve the quality of life of older people living alone, enabling them to remain at home, in a safe and secure environment through a daily help and psychological support, as well as through daily phone calls aimed at providing companionship and detecting any situations of “discomfort”, which would not be otherwise perceived by local services, while maintaining contact with users until the solution of the detected problem would be found. As well-known, health problems often hide and exacerbate not otherwise perceptible social problems and they require a twofold integrated management of health and social care. For this reason, these two aspects have never been separated in the testing of the project.

## 1.2. Brief description of the original good practice:

The main objective of this branch of intervention performed in Bologna, Emilia-Romagna is to guarantee a socio-assistential network, aiming to favor the possibility for the senior to anticipate his return to home from the hospital, “protecting” the discharge in a prospective of assistential continuity and of prevention of a further hospitalization.

The actual implementation modality consists in the provision to the senior of a temporary service supporting the hospital discharge, according to the real necessity of the citizen, allowing therefore a return to home that is earlier than what would be possible in standard times, without the service. This way, a double important result is obtained: on the one hand, to reduce the length of the senior’s hospitalization, allowing him/her to be back at his/her domicile as quickly as possible; on the other hand, to produce a significant reduction in hospitalization costs, notoriously very high.

The service target is constituted by the senior population, with a special attention dedicated to citizens over 70, selected according to the following criteria:

- Conditions of partial self-sufficiency, that are expected to be temporary and depending on the event which caused the hospitalization;
- A family that is present and able to collaborate, but not to take charge of the need or part of it;
- Co-presence of socio-assistential exigencies and necessity of a health support, of whatever entity.



The selected subjects, that are signaled by the hospitals before the actual discharge, are provided with a temporary support, with a variable lengths from one to six months, according to the real necessity of the senior; such support can consist in a professional intervention with highly specialized personnel (professional nurses, other paramedical staff and so forth), in addition to the presence of a familiar assistant, full time or part-time on a daily/weekly basis, able to take care of the daily domestic errands (shopping, cooking of meals, house cleaning, personal hygiene and so forth).

In these cases, the e-Care service performs the extremely important role of “hub” of the entire service: through the Contact Center, in fact, the persons discharged from the hospital are monitored in all the aspects related to their condition: the patient or his/her relatives can, in fact, call on a 24/7 basis to signal problems of any nature, and the operators take charge of the problematic situation. The involved professionals also regularly refresh the information provided in the socio-health file of the citizen, in order for all the subjects that are involved in the assistential process to remain always updated on the evolving situation in all its aspects, as well as on the treatments or services that have been implemented for the assisted person. In addition, the Contact Center monitors the state of the relationship between the assisted person and the familiar assistant, in order to try to solve all the possible cases of friction or conflict that can occur in the daily exchange.

### **1.3. The technological and organizational background of the e-Care Service**

The experimental project was made possible in Bologna and in the Emilia-Romagna, region starting from five major technical and organizational "Enablers":

1. The presence of a high-tech network that connects all the 4,000 General Practitioners and Primary Care Paediatricians with the public hospitals of the entire Region (the S.O.L.E. – Sanità On LinE – Health On LinE Network), which makes it possible, among other things, the exchange of information and advice between professionals and the integration of General Medical Practitioners' records with medical reports and examinations carried out in all regional facilities, as well as the hospital discharge letters;
2. The well-established Electronic Personal Health Record, made possible by the Health On LinE Network, and developed on the basis of Ministerial Guidelines and European Community legislation. The Electronic Health Record, through a customized "My Page", presently allows citizens to collect and manage all their health data; in the next future it will be possible to also collect their socio-health data;
3. The presence of a public company, such as CUP 2000 S.p.A., which works as “in-house provider” operating on behalf of its public shareholders (the Emilia-Romagna Regional authority, the Municipal and the Provincial authorities of Bologna, all 17 Local Health



Authorities, including local out-patient and Hospital facilities at the regional level). CUP 2000 is a major Italian company with very high expertise in eHealth and eWelfare, entrusted by the Regional authority with the task of implementing the two above mentioned projects, which are two best practices at both Italian and European level;

4. The experience acquired by CUP 2000 and by the Local Health Authority of Bologna, in several projects funded within the framework of European research programmes, focused on the themes of Telemedicine and Information & Communication Technology services for home-based care of the elderly;
5. The Decision by the Emilia-Romagna government which has set up the Regional Fund for Non Self-Sufficiency. Emilia-Romagna is the only Italian Region that has set up a special *ad hoc* fund, fed through a specific tax income dedicated to interventions in furtherance of the prevention and care of dependent elderly people. About 450 million euros are allocated each year to the Regional Fund for Non Self-Sufficiency, that is aimed at the development and enhancement of an integrated flexible service network, evenly distributed throughout the region, centered on the needs of dependent elderly people, of their families and caregivers, with a specific focus on activities in support of frailty and prevention.

Other technological instruments, like the devices that are necessary for the telemedicine applications and the fall sensors, have been utilized in the course of the service development, but have been considered as a “state of the art” technology, therefore no scientific experimentation on these devices has been performed, give the high number of European projects already existing in the field.

## 2. Monitoring grid

The Monitoring Grid will be tested and implemented in Burgenland. The Samaritan Department Burgenland is provider of assisted living homes. Therefore the Monitoring Grid shall be implemented in the assisted living homes. People living there shall be the target group of testing. At the moment (May 2020) there are 61 residents living in assisted living homes in Burgenland provided by the Samaritan Department Burgenland. 10 of them will be engaged in the project.

The Monitoring Grid is a software, which is based on the long-term experience of e-Care Network in Bologna developed in 2005. In order to make the Monitoring Grid applicable to the Austrian population, both Austrian legislation and the needs of the older population were taken into account.

The Monitoring Grid will apply to people over 75 years old, who are living alone or with their spouses and are affected by so-called frailty factors. These factors are classified into 3 groups:



- Functional frailty factors: feeding difficulty, difficulty in movement, falls, sensory deficits
- Clinical frailty factors: respiratory and/ or cardiac diseases with complex therapeutic treatments, diseases with frequent clinical examinations and/ or referrals, chronic pain, hospitalization, depression
- Social frailty factors: caregivers of people requiring ongoing care, people living in remote or derelict areas, with low income, inadequate housing, lack of help from family or friends.

Depending on the types of frailty identified for each user, the Grid points out a series of „sentinel events“. If one or more sentinel events are detected, the eCare Call Center reports and refers these cases to the eCare Network Health and Social Services, who will then take immediate action. In the course of this project this tool shall be extended based on other EU good practices and adapted to the local conditions in Austria.

Overall aim of implementing Monitoring Grid is to enable older people to live an independent life at home as long as possible. This may be achieved by regularly monitoring the state of health over a longer period of time. The Monitoring Grid will be a simple monitoring tool, which is used for older people to enable them to live independently at home as long as possible. In this respect, it represents the basis for weekly calls. These calls serve to identify a deterioration in mental and physical health as quickly as possible. This means, it not only pursues the goal of recognizing a deterioration in the state of health as quickly as possible, it also intends to manage and facilitate phone interviews with frail elderly people, thus constituting a true guide to handle phone interviews.

### 3. AP NURSE

The scope of the project adopts good practice recommendations from Bologna. The digital tool aimed to be developed uses modern sensors deployed in the monitoring environment without requiring them to be attached to the patients. It implements back-end software solution for data gathering that is robust to cope with cyber threats as well as makes possible implementing of machine learning and AI based principles. The AP-NURSE platform is designed to monitor patients suffering from Parkinson's and Alzheimer's diseases with potential to be applied also for frail elderly. The adaptation of the AP-NURSE-HOME and CARE solutions will generally increase the quality of life of patients and personnel responsible for their monitoring and treatment.

A simple and modular monitoring tool for patients suffering from Alzheimer's and Parkinson's disease for home and medical application encompassing ambient sensors, which can monitor





activity patterns, gas, temperature and sound aspects. Its aim is to simplify the work of home caregivers or nurses by monitoring basic interactions of the patient with the environment during night or job duties and provide fast alert about possible dangers and support independent living of frail elderly.

The main ideas behind the proposing system are:

- Monitoring of basic environment indicators surrounding the patients during day and night.
- Evaluating these indicators and, in case of alarm situation, informing the caregiver or responsible personal. The best solutions in this case are vibrating bracelet notifiers.
- Widely affordable system, overall cost for development and later sales must be as low as possible, this also result in very simple system.

### **Monitoring the patient's environment:**

By monitoring the patient's environment, we understand monitoring surrounding common areas as:

- Bedroom
- Kitchen
- Adjacent hall or entry to the flat or house
- Other rooms in living area of patients

Basically, in most cases monitoring the closest room to the patient living space, the bedroom and kitchen, will be enough to build a digital monitoring area. This placement of peripheral devices is sufficient to observe basic habits and prevent potentially dangerous situations in those areas.

### **List of monitoring sensors:**

- Light
- Sound
- Movement PIR
- Acceleration (movement of bed, door opening)
- CO<sub>2</sub>
- CNG
- Humidity
- Atmospheric Pressure
- Force pressure

### **AP-NURSE-HOME**

Set of simple and cheap small monitoring devices that monitor several environmental factors of patient surroundings are placed at home of frail elderly or a patient to ease their everyday life.



In case of any emergency detected by the monitoring devices a caregiver is notified by a simple rubber watch/bracelet. We assume that a patient lives with a caregiver (in this case family member). To ease the life and not to disturb the caregiver's partner (husband, wife) during night, the bracelet warns a caregiver by vibrating pattern (for communication RF433MHz module with hard encoded addresses is used). After the caregiver received this notification, he needs to push a button on the device, which had sent the signal to assure that the necessary help was delivered to a patient. If needed, online measured sensor data under and above set thresholds may be sent to dedicated servers for further analysis.

### **AP-NURSE-CARE**

Set of small monitoring devices that monitor several environmental factors of patient surroundings are placed at care center to ease the daily and specifically nightly routine duties of caregiving personnel.

In case of AP-NURSE-CARE the caregiving personnel controls the condition of patients from the nurse/control room on a PC or using a mobile device, visualizing the parameters of AP-NURSE utilizing a simple traffic lights logic. The online measured sensor data below and above set thresholds are sent to the dedicated servers for further analysis.

If required, after a specified monitoring period, artificial intelligence could deliver results of analysis showing progress and health status of monitored patients. The registration and the setup of the monitor screen would solely be adjustable under administrator account.

## **4. GPS tracker**

The gps tracking technology will be developed in Treviso, Italy and it will support the daily care work in elderly residences. This technology can provide greater autonomy to patients and offer a tool to facilitate control by formal caregivers. The technology would allow older people to leave the facility autonomously in predefined areas and there will be integrated fall detection system;

The objectives that are intend to achieve through the implementation of GPS tracking technology and the model are the following:

Increasing the safety of the person with Mild Cognitive Impairment (MCI) and at the risk of developing dementia, while supporting the formal and informal caregiver in the care activity;

Supporting orientation, not surveillance of persons, but the possibility to reach persons in case of emergency and the possibility to offer help, if necessary;

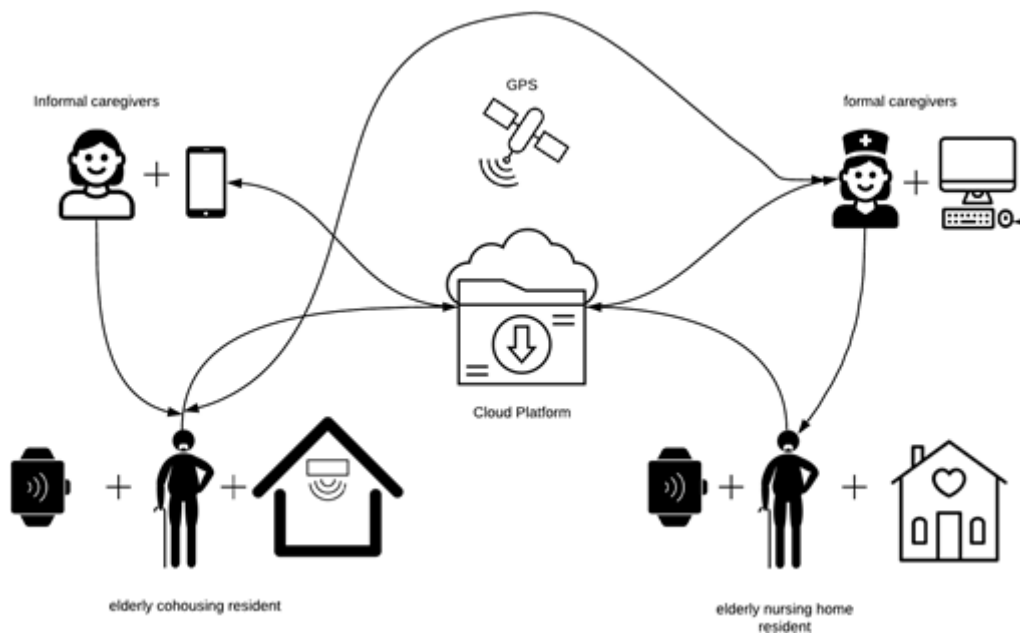


Preventing dangerous situations, reducing the risk of people getting lost and reducing those methods of restraint that limit people's freedom;

Reduce caregivers 'anxiety. In fact, concern about the safety of one's relative is a variable that can produce an increase in the level of stress, leading, among other things, to a worsening of the quality of life of the informal caregiver.

The target groups of the gps tracking solutions are older people with Mild Cognitive Impairment (MCI) and formal and informal caregivers. First target group includes older people aged 65 or more, with MCI living in cohousing alone or with an informal caregiver and older people that live in nursing home with formal caregivers assistance. Mild cognitive impairment (MCI) is defined as cognitive decline greater than expected for an individual's age and education level, which does not interfere affect basic activities of daily living. In people aged 70 years and older, the reported prevalence of MCI ranges from 14 to 18% and the progression rate to dementia is 5-15% per year. MCI is widely considered a transition stage between normality and dementia, however not all patients with MCI convert to dementia: several studies reported that about 60% of these patients remains cognitively stable in a time range of about 2-3 years<sup>1</sup>. However, MCI represents an extremely heterogeneous condition. MCI may represent the clinical manifestation of an incipient neurodegenerative process, thus constituting the early stage of Alzheimer Disease and other dementias.

- The overall architecture of the GPS tracking solution that we will implement will consist of the following elements:
- The actors: the person affected by MCI, the informal caregivers (mainly composed of the person's family members) and the formal caregivers, i.e. those nursing home employees with specific care management skills (mainly nurses).
- A cloud platform in which the platform is hosted. which allows the connection between elderly and caregivers, Moreover, Connectivity with cloud platform to transmit indoor and outdoor localization.
- A mobile application explicitly dedicated to informal caregivers or a third party service with similar features:
- A web based application dedicated to formal caregivers
- A set of sensors to be implemented at the home of the elderly person



## 5. Online sleep monitoring system

Partners at Brno University of Technology will work on tool called Online sleep monitoring system. Scope of the tool adopts good practise recommendations from Bologna. The developed digital tool uses modern wearables sensor together with artificial intelligence, which will monitor patients during their sleep and will recognize potential early markers of brain diseases. The device will be able to recognize with 87% success the emerging Parkinson's disease at a stage when it is possible to control it pharmacologically and prevent the development of the disease. In addition, testing can take place at home with an incomparable financial burden. The biggest advantage is that in this way it is possible to catch the oncoming disease and apply early treatment. Treatment is more effective when administered early. Early treatment is able to prolong many times the time a senior can stay in their home environment. This will allow the senior to remain in the natural environment for a longer period before the disease develops to a stage where caring for him will be too demanding.

In addition, the developed device can be shared, lent repeatedly. After one senior completes the 45-day monitoring, the device is returned to a social worker, doctor, or other owner, who performs simple maintenance, and the device can be lent to another elderly for another sleep monitoring.

The proposed system will be designed to enable easy, in-home sleep quality measurement, assessment, and monitoring using affordable wearables and modern technologies. From the high-level perspective, the workflow (use case) can be described as follows:

- A patient at risk of having/developing sleep disorders (as mentioned in the previous section, this can be a prodromal market of developing a neurodegenerative disorder such as PD) borrows an actigraph from a doctor.
- Next, he/she wears it for a couple of days during sleep according to the instructions provided by the doctor to acquire large enough data sample to be analyzed by the sleep monitoring system.
- Then, he/she uploads the sleep data via the web interface/or brings the actigraph to the doctor for the processing. And finally, he/she gets a detailed report about his/her sleep from the doctor.

This simplified use case scenario can be seen in Figure 1 (1-2: data acquisition. 3: data storage, processing and analytics, 4: sleep report combining the output of the sleep monitoring system and the doctor's expertise in the given field).



## 6. Care method of patient discharged from hospital

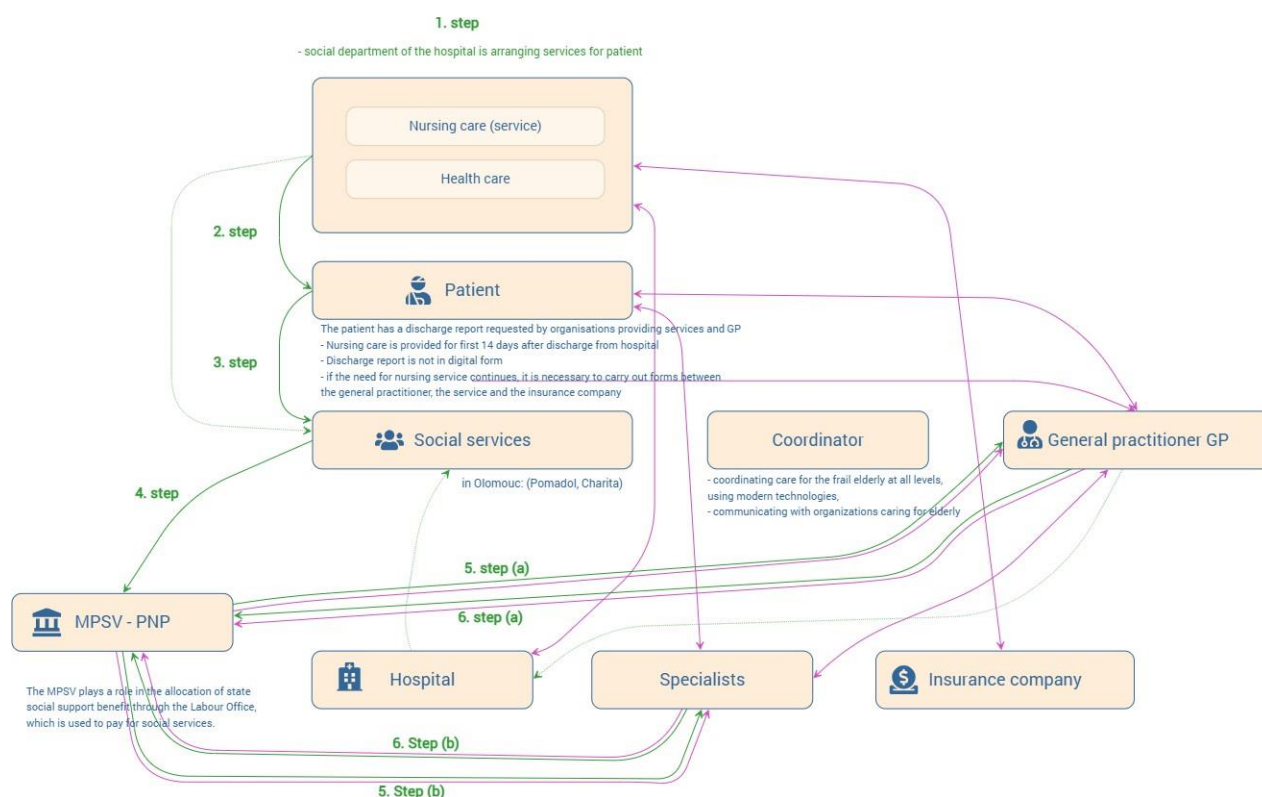
Partners z University Hospital Olomouc will develop platform for data sharing in order to facilitate communication and dokument sharing between health and care actors. The main advantage of Emilia Romagna region, as same as whole Italy, is EHR. Health and care workers are able to collect data they need to provide services to people in need and also communicate within this system.

The platform will enable teleconferences between the patient, his caregivers and physicians, including orders for remote appointments at doctors. The platform will also allow electronic sharing of medical reports and vouchers for home care, including top-level cybersecurity. Actors for



communication and data sharing are illustrated on picture below. The new position in the system is a coordinator of care. As in Emilia-Romagna, In Czech Republic too, the aim is to guarantee a socio-assistential network, aiming to favor the possibility for the senior to anticipate his return to home from the hospital, “protecting” the discharge in a prospective of assistential continuity and of prevention of a further hospitalization.

In Czech Republic, same as in Slovakia and Slovenia, information on health status is not shared electronically even between attending physicians. Information about the social situation is also not shared between individual providers. All communication takes place in the form of paper documents. This imposes an obligation to transmit these paper messages between doctors, between social and health services, between services and doctors, and the control of the health insurance company is also involved in this paper reporting. These unnecessary trips have to be made by the patients themselves, their family members, and later by the staff of the Home Care Agencies. All this at the expense of patient safety and, in the case of staff, time spent with the patient. Our solution responds to this situation and tries to at least partially adjust the sharing of information following the example of Bologna practice. The tool will also be partially implemented in the Frail index, which we will try to use in Czech conditions. Given the system of health and social services, it seems the most appropriate to implement the variance of the Frail Index - Monitoring Grid, which is being developed within the project.



## 7. Digital platform YouBOS

Partners from LEPIDA will develop platform to support frail elderly people and their caregivers, who are not particularly skilled with technology. The aim of the tool/platform is to create a virtual community to promote the creation of new relationships, to share contents, activities and events carried out by voluntary organizations on the territory, taking care of the frail seniors, often isolated, helping them by using digital tools to discover new relational models. The tool aims to connect people, social health workers and volunteers in the third sector to encourage the creation of a community to support the more frails, facilitating the maintenance of their autonomy and improving their quality of life. YouBOS has been designed as a tool to facilitate -the access mainly of the seniors and their caregivers to needed information and support through the use of the content published on the website platform. The tool at the same time invites the elderly to take an active part and thus co-create the contents of the platform through specific thematic areas. The possibility to interact directly through a forum with other users serves to maintain relationships between peers and be able to ask questions of interest to experts and the editorial staff of the platform, thus receiving answers to their needs.

Through the web platform we develop projects aimed to promote:



- virtual socialisation;
- make them more active;
- healthy lifestyle;
- reduction of the digital divide and users' social isolation.

The digital tool will allow the elderly and caregiver to:

- create new relationships thus avoiding the risk of isolation and loneliness
- have access to social and health information
- know the network in the territory constituted by voluntary associations
- find tips for healthy lifestyles, such as sweet gymnastics exercises
- find answers to their needs
- create content to populate the platform
- keep up to date on the activities organized in the territory
- find tips to stay active
- find support for the use of technology to interact with experts
- be monitored about their frailty status

The YouBOS platform contents are organized as described as follows, each section incorporates audio-visual content produced under a collaborative approach with the eCare community.

- a connecting Blog, moderate by an editor who interacts with the users;
- “The expert’s corner area” which will transmit live on channel or in asynchronous mode uploading the video on the web portal, giving the possibility so far to collect the questions by the users and forecast the subsequent replies;
- The creation of “thematic areas” such as for example the “Laboratorio del Fare” (Lab for sharing) where the users contributions are published, “Attivi per forza” (Need to stay active) there are loaded gentle exercise videos, workout, “Parole fra noi” (between the words) in which are explained daily complex terms usually in a foreign language like english.





The role of the blog's entertainer and of the Lab for sharing will be assigned to the project leader of the "Call for ideas".

YouBOS will allow an integration among the different technologies used in order to guarantee access to the greatest audience giving them equal access opportunity. To make an example, the "on air" video transmission delivered through Facebook or Youtube will be made available directly on the YouBOS platform for seniors who do not have any account on those social media.

## Conclusion

Based on good practice from Emilia Romagna, Brno University of Technology is developing a online sleep monitoring system, that will be used for cheap, private (at home used) and therefore more accessible early detection of onset dementia and Parkinson's and Alzheimer's disease. Which can have effect on early detection of disease a therefore effective treatment, which can prolonged the part of life, that can elderly people spent in their own homes. Partner from Slovakian University of Technology in Bratislava will develop monitoring tool for patients suffering from Alzheimer's and Parkinson's disease for home and medical application. It encompasses ambient sensors, which can monitor activity patterns, gas, temperature and sound aspects. Its aim is to simplify the work of home caregivers or nurses by monitoring basic interactions of the patient with their environment during night or job duties and provide fast alert about possible dangers and support independent living of frail elderly. Samaritenbund Burgenland will use the Frail Index, which is compound of GP in Bologna and transfer it into Monitoring Grid – tool for monitoring quality of life and oncoming need for care of people over 75 years in Burgenland. Lepida SCPA will work on tool YouBOS - a platform to support frail elderly people and their caregivers, who are not particularly skilled with technology. The aim of the tool/platform is to create a virtual community to promote the creation of new relationships, to share contents, activities and events carried out by voluntary organizations on the territory, taking care of the frail seniors, often isolated, helping them by using digital tools to discover new relational models. Institute for elderly care and shelter will develop system based on gps technology, which aims to guarantee a higher level of freedom to the person suffering from dementia, while ensuring a high level of protection and safety. University Hospital Olomouc will develop platform for online communication and data sharing amongst patient, health care provider and home care providers (and other stakeholders).