Agenzia sanitaria e sociale regionale

RegioneEmilia-Romagna

SERVIZIO SANITARIO REGIONALE
EMILIA-ROMAGNA

# Regional experiences in the context of the European Innovation Partnership on Active and Healthy Ageing

**In the framework of the International Workshop**
**"Vivere sani e attivi in un continente che invecchia"**
**["Living healthy and active in an ageing Europe"]**
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# Summary

# Introduction

Population ageing is one of the major challenges that Europe will have to face in the near future.[1,2]

Strategies to achieve an active and healthy ageing are paramount to improve the quality of life of senior citizens. On the one hand, it will enable senior citizens to actively participate and contribute to society while growing older, getting more out of life. On the other hand, it will contain, and hopefully decrease, the unsustainable pressure exerted by population ageing on healthcare systems.

Besides being a challenge, population ageing offers an invaluable opportunity to retune and/or create healthcare services in a more patient-oriented configuration, for the benefit of the European healthcare system as a whole and of the innovation industry.

Starting from these scenario/challenges, in 2012 the European Commission launched the **European Innovation Partnership on Active and Healthy Ageing** (**EIP-AHA**)[3,4] in the frame of the "Europe 2020 Flagship Initiative".[5] Notably, 2012 was appointed as the **European Year for Active Ageing and Solidarity between generations**.

This Partnership, which has been selected as the pilot initiative to face the challenge of population ageing, aims at **a two-year increase of healthy and active average lifespan for European citizens by 2020**, meeting three objectives:

- to improve health and quality of life of European citizens, with particular attention to seniors;
- to support long-term efficiency and sustainability of healthcare services;
- to increase the competitiveness of European industry by creating growth opportunities and new markets, ultimately contributing to a sustainable growth.

Some of the currently ongoing research projects, related to the EIP-AHA Partnership and carried out in the Emilia-Romagna Region, will be presented here.

Each programme will be presented in a structured way and distributed to all participants during the "Vivere sani e attivi in un continente che invecchia" event (Bologna, June 3rd 2013).

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1 Recent projections have shown that in the next 50 years European senior citizens ages 65 and older will double, moving from 87 million in 2020 to 148 million in 2060. If left untackled such demographic transition will seriously endanger financial sustainability of European healthcare systems. For more information see: http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/ (last access May 2013)

2 In depth-analysis for Emilia-Romagna region in Chapter "The regional context" in the present document.

3 EC Communication - COM(2012) 83 final: "Taking forward the Strategic Implementation Plan of the European Innovation Partnership on Active and Healthy Ageing" http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2012:0083:FIN:EN:PDF (last access May 2013)

4 Motion for a European Parliament Resolution on the European Innovation Partnership on Active Healthy Aging http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+REPORT+A7-2013-0029+0+DOC+XML+V0//EN (last access May 2013)

5 See EC Communication - COM(2010) 2020 Final: "Europe 2020. A strategy for smart, sustainable and inclusive growth" http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF (last access May 2013)

EIP-AHA represents a novel strategy aimed at supporting the entire Research-Development-Innovation chain by overcoming barriers and thus bringing together all the relevant actors playing a role in the innovation cycle, as well as public and private partners. This will speed up the spread of innovation and profit from synergies set up at EU, national and regional/local levels[6].

The Regional Agency for Health and Social Care of Emilia-Romagna Region (ASSR) Working Group:
Antonio Addis, Barbara Mazzoni, Luigi Pilolli, Silvia Pozzi, Tania Salandin, Federica Sarti

[6] In order to ease the exchange of ideas and partners collaborations the EC created a web-based platform open to all involved players: cd. marketplace (https://webgate.ec.europa.eu/eipaha/ - last access May 2013). Such platform is supposed to aid partners seeking and collaboration setup, helping sharing projects and documents and stimulating ideas exchange and good practice transfer.

# The regional context.
# Demographic trends in the Emilia-Romagna Region: what next?

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Population changes, and more specifically modifications of population subgroups ratio, are key elements to reflect upon when talking about the future territorial development.

Migrations, intrinsically unpredictable, and the ageing phenomenon, which is genetically pre-determined, characterize and drive the future territorial development, thought at different levels.

Emilia-Romagna (E-R) is the Italian Region that underwent the fastest and deepest transformation with respect to the age structure. In just a few decades, and about ten years in advance with respect to the rest of Italy, senior citizens took over the young ones. Indeed, the 1961 census showed the presence of one 65-year old and plus every two individuals below age 15, while in 2001 the reverse was true, with two senior citizens every young one (ageing index[7] = 193).

Opposite to the rest of Italy, where the senior to young ratio is still growing, in the E-R Region it has been decreasing in the past 10 years, despite the growing number of seniors. The reason behind the latter phenomenon is a higher increase of the young population thanks to the growing number of births and immigration. International immigration, starting at the beginning of 2000, changed gear to a crystallized population status, characterized by scarce renewal ability due to very low fertility and very high longevity.

Arrival of young foreigner citizens (mean age 31 *vs* 47 of the Italian population) slowed down the Italian population ageing process, speeding up the young age group growth, while not affecting the elderly yet.

Being slightly if not at all affected by immigration dynamics, prospective evolutions of the E-R Region senior population will be mainly driven by mortality rate at different ages, which can be expressed as life expectancy at birth (the statistically expected number of years of life for a person born in a specific year, in a given territory, experiencing the mortality rates of the relevant population).

Despite the recent slow down, as well as the decreased discrepancy between male and female survival rate (favouring the latter notwithstanding the 100:105 female to male birth ratio), life expectancy at birth has been growing over the past century.

When considering the past two decades, between 1991 and 2001 life expectancy underwent a three- and two-year change among males and females, respectively, switching from 74 to slightly more than 77 for males and from 81 to 83 for females. During the following decade, the still growing life expectancy suffered a one-year decrease in both males and females.

Life expectancy estimation in 2011[8] were 80 and 84.7 for males and females, respectively. All in all, in the past 20 years mean age in the E-R Region saw a 6- and 5-year increase in males and females, respectively.

Thus, given the aforementioned trends, this indicator is still growing, yet at a slower pace and with a male *vs* female gap reducing over time (in the next 20 years it is expected that life expectancy will be characterized by a 5- and 4-year increase in males and females, respectively). In the middle variant the

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7 Old age index: number of 65 and plus year people in the population as a percentage of the 0-14 year old population.

8 Source: Istat.

observed slow down could be reduced to 3.5 and 2.5 years for males and females, respectively. On the other hand, in the low variant, the hypothetical growth would be 2 and 1 years for males and females, respectively.[9]

In dealing with demographic estimates and projections, hypotheses about life expectancy go hand in hand with those relative to fertility and migration flows that can be presented using the same three scenarios to predict age and gender structure of the future E-R population.

Being solely affected by survival improvements among the elderly, not likely to induce significantly different results in the next 20 years, the over-65 age group is subject to the lowest variation over the three demographic scenarios.

The elderly age group has been, and will still be, consistent in the future, reaching the value of one million residents and over in the next decade. However, the elderly age group weight over the entire E-R population will be stable, fluctuating between 22.3%-22.8% and 23.9%-25% in 2020 and 2030, respectively.

Despite the 65-79 and over-80 age groups being predicted to behaviourally diverge in the next 20 years, projections show that the elderly age group increase will concentrate on individuals 80 year old and plus. The latter are expected to grow in the 2010-2020 decade only. As a result of the expected slowed down growth between 2020 and 2030 in the over-80 age group there will be a greater increase concerning the 65-79 age group, also by baby-boom individuals born in the 1954-1964 period. Indeed, the E-R Region registered the maximum number of birth events in 1964: about 58,000 as compared to 40,000 today.

**65-year or plus population divided into age groups and scenarios - in 2010, 2020 and 2030 - in the Emilia-Romagna Region**

| | 2010 | 2020 | | | 2030 | | |
|---|---|---|---|---|---|---|---|
| | | Low variant | Middle variant | High variant | Low variant | Middle variant | High variant |
| 65-79 | 679,569 | 690,508 | 697,261 | 703,826 | 791,921 | 814,855 | 836,568 |
| 80+ | 306,123 | 356,208 | 362,848 | 369,725 | 369,760 | 394,417 | 421,039 |
| *Tot. 65 +* | *985,692* | *1,046,716* | *1,060,109* | *1,073,551* | *1,161,681* | *1,209,272* | *1,257,607* |

Age threshold, conventionally set at 65, might be brought into question in countries such as Italy where lifespan is way longer than 65 years and where the onset of chronic and disabling diseases is delayed.

Disability is more frequently found in individuals over 85, when the natural ageing process adds up to chronic and invalidating diseases. On the other hand, life expectancy in healthy conditions at birth, which can be obtained by combining mortality and healthy subjects rates in 2010 in E-R[10], was 60.8 and 58.3 in males and females, respectively, thus sensibly different from life expectancy alone. This is particularly true in females, for which the advantage of a longer life expectancy at birth turns into a disadvantage when considering the foreseen higher number of years of life in bad health.

In conclusion, the expected changes in the E-R demographic structure run along the same lines pointed out for demographically mature systems: the elderly fraction increase, population faces the ageing phenomenon with a concomitant decrease of the working fraction, and, though still uncertain, an increase of the population in schooling age is expected in the near future.

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9 Generating hypotheses on mortality rate is much more complicated (eg because the increase is not proportional across all age groups).

10 http://www.istat.it/it/files/2013/03/1_Salute.pdf (last access May 2013)
Source: Istat, Survey on the number of deaths and related causes.

Distribution of unhealthy conditions and disability are under evolution among the elderly as well, and calls for proper attention when discriminating evolution basing on age groups and degree of vulnerability, which are as important as demographic dynamics, though not specific object of this presentation.

# 1. Novel approach for improvement adherence to medical plans, medication and management of bioresources and drugs


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**Background and aims**

Outsourcing and/or territorial centralization of testing, at least in the routinely setting, is becoming a consolidated trend in healthcare governance. A non-coordinated process between the various stakeholders may introduce elements of uncertainty in clinical decision and determine relevant delays in the therapeutic actions. This project will allow to harmonize the different actions of the various stakeholders and gather information useful to assess the level of the provided services, to reduced healthcare costs by improving accessibility and quality of care of target groups in a given Region.

**Type of innovation**

The partnership aims at:

- creating IT platforms in Cloud environment to promote real time information exchange among patients, hospitals and pharmacy;
- developing a novel technological individual packaging for the elder, which can be used both in hospitals and outpatient settings;
- databases and novel methods for population clustering to develop personalized therapeutic programmes and to improve adherence to treatment;
- creating an innovative Integrated Logistic Platform for Biological samples (BS) and Pharmaceutical products (PH) delivery and storage for quality monitoring and certification;
- customer satisfaction evaluation of the provided services.

**Scalability-replicability Trasferibility**

Identification of risk factors affecting health status led us to improve the lifestyle in target groups. Evaluation of adherence rates to therapies used for chronic diseases in the elder, using patients' databases and observational studies based on drug prescription databases, allows to assess specific adherence issues and contributes to the sustainability of services. IT tools combined with Logistic/Automation and innovative technological equipment for hospital and homecare boost competitiveness.

**Results**

- Inappropriate prescription reduction as well as the decrease of the number of inappropriately poly-medicated patients
- Monitoring: life cycle of pharmacological therapy, results of clinical tests and adherence to prescription
- Adoption of the necessary safety criteria for the management of therapies and the related clinical data
- Implementation of appropriate support programmes, tools and educational materials to address adherence in different target groups.

# 2. From the "fall" phenomenon evaluation in hospital to empowerment of citizens and professionals


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|---|---|
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**Background and aims**

Falls prevention is a risk management issue on which there is attention both at national and regional level. The University Hospital Trust of Parma defined falls prevention a clinical governance and risk management priority. The citizen/caregiver/ professional empowerment is a key element in falls prevention effectiveness. The purpose of this work is to develop involvement/information/education strategies for all actors that contribute in healthcare processes.

**Type of innovation**

The management system innovation in the "falls" phenomenon was carried out through the following steps:

- identification of a multi-professional working group in the University Hospital Trust;
- implementation of an Incident Reporting System specific for "falls" phenomenon in the University Hospital Trust;
- organizational and departmental identification of risk profile on the basis of the received reports;
- redaction and circulation among professionals of an agile and specific communication tool;
- preparation of a poster and a brochure to disseminate recommendations for patients and caregivers;
- national recommendations and prepared materials release on the Hospital website.

**Scalability-replicability Trasferibility**

Intra-organization transferability: among wards with different clinical competence; among wards and other services.

External transferability: between the Hospital and Local Services; from the Hospital setting to the patient's home. The project, carried out with internal resources, has been positively acknowledged by professionals.

Raising awareness among professionals on falls risk led to preventative interventions realization.

This experience was presented at the regional level and contributed to the definition of Good practices for AGENAS of the Emilia-Romagna (2012).

**Results**

If observed data will be confirmed over time, the empowerment of citizens-caregivers-professionals could contribute to significantly reduce injurious falls and the costs of diagnostic tests and specialized visits post-injuries (a first estimate suggests that the economic value of the fall phenomenon in University Hospital Trust of Parma may be at least € 50-60.000 per year).

# 3. Importance of motion sensors in the identification of older patients at risk of falling


| | |
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**Background and aims**

Falls in the elder are one of the most important geriatric syndromes because of the impact on disability and quality of life both of patients and their family. Identification of causes of falls, often multi-factorial and affecting multiple organs, is mandatory to prevent the fall event.

Together with well-known risk factors, nowadays there is the chance to refine and extend the search of elements useful in falls prevention by means of wearable motion sensors capable of objectively measure parameters of the subject mobility profile.

Aim of this study is to identify quantifiable elements measured by the motion sensors that can be useful in defining older patients at risk of falling and to identify both non-pharmacological and pharmacological therapeutic targets.

**Type of innovation**

Technological innovation in the clinical field with primary and secondary prevention objectives.

**Scalability-replicability Trasferibility**

All tests used in this study have been widely validated in the literature. The wearable motion sensor is a non-invasive tool, easily replicable in different clinical settings and easily transferable.

**Results**

We report preliminary data related to a pilot study carried out on 90 patients admitted to the Cardiogeriatric Ward of the Chair of Geriatrics of the S. Agostino-Estense Hospital in Baggiovara. All patients were submitted to complete examination, 12-leads electrocardiogram, history of fall risks, blood pressure measurement and evaluation of orthostatic hypotension. Moreover, the principal tests for gait, balance and strength (standing balance, chair standing, Functional Reach test, Timed Up and Go test (TUG) were performed instrumented with the wearable motion sensor.

The 90 patients were divided into two groups, according to their risk of falling. Interestingly, with equal scores in the clinical TUG, patients with a higher risk of fall had worst performance in many parameters measured by motion sensors.

In conclusion, we strongly believe that the routine use of wearable sensors will be able to add new and fundamental elements in the prevention of falls and of the subsequent disability.

# 4. Falls risk assessment in a hospital setting


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**Background and aims**

The Local Health Trust of Reggio Emilia has been monitoring in-patients falls since 2003. A retrospective survey covering the period 2003-2011 showed an increase of falls incidence in the 5 corporate hospitals, ranging from 0.67 to 1.53 per 1,000 patient days of all admissions, due to the improvement of the reporting procedures. We also developed a scoring system to classify subjects at high risk of falling (red), low risk (green) and unclear risk (yellow). This tool consists of a one-page form, which is based on previously published selected scoring systems. "Yellow" patients only undergo a further instrumental assessment of balance (30 minutes) to more accurately classify them as "red" or "green" patients. The scoring system has been administered for 6 consecutive months to all patients (no = 190) of the Orthopedic, Pulmonary, Intensive and Extensive Rehabilitation wards of the S. Sebastiano Hospital of Correggio. The scoring system can be applied to the majority of patients (except for vegetative and minimally conscious states). On average, less than 5 minutes were needed to collect data. Sensitivity and specificity of the scoring system in predicting falls were 70% and 87%, respectively.

**Type of innovation**

We developed and tested a scoring system to stratify the risk of fall assessment in a hospital setting, which can be delivered in less than 5 minutes, with a predictive value greater than those of published algorithms and not limited to geriatric patients.

The high specificity of our scale (87%) is nearly double than that of the available clinical scoring systems, and rely on the joint assessment of clinical, nursing-related and functional risk factors. Such specificity allows the specific delivery of preventive interventions, which can be influenced by positive items in the scoring system.

**Scalability-replicability Trasferibility**

Once validated in a wider sample, our scoring system can be applied in similar hospital settings. Data acquisition regarding ambulatory patients is in progress.

**Results**

For each hospitalized patient it will be possible to:

- assess the level of risk (red/yellow/green),
- identify the major risk factor(s),
- design a tuned preventive action, if needed,
- design a pointing out procedure (e.g. red wristband).

# 5. Multifactorial program for prevention of accidental falls in hospital at "Rizzoli" Orthopedic Institute - Bologna


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**Background and aims**

Hospitalization increases the risk of falling. Among the consequences of accidental falls are increased of costs. Many study confirm that multi-factorials programs reduce the incidence of falls in the hospital. The principal objective of the program was to reduce the incidence of accidental falls in the hospital and related damages, as well as associated claims, by applying healthcare interventions aimed at preventing and eradicating the main risk factors.

**Type of innovation**

The realization of the program encompassed:

- training of clinical staff;
- classification of fall risk for hospitalized patients by using the Morse Scale;
- implementation of healthcare interventions to reduce risk factors for accidental fall;
- implementation of informational and educational activities directed to patients and family members.

The program evaluation activity included:

- monitoring of falls, injures and claims rate;
- verification of the correct application of the applied procedure;
- a survey given to parents of pediatric hospitalized patients, to assess the quality of information provided by healthcare personnel;
- an economic analysis of costs for program design and implementation phase.

After an initial test carried out in 3 wards, which was started in 2010, the program has been extended to the whole Hospital in 2011.

**Scalability-replicability Trasferibility**

Provided that different organizational contexts exist, program implementation and evaluation activities can be transferred to other hospitals.

**Results**

Outcomes evaluation showed a significant reduction of harms to patients between 2009 and 2011 (-100% and -75% reduction for medium and serious lesions, respectively) and a 67% reduction of claims in the same period, good adherence of health personnel to the company procedures (correct application of the Morse Scale in 78% of cases and correct application of healthcare interventions in 89% of cases) Results of the survey showed a high-quality level of information provided by staff to parents of pediatric patients (completeness and clarity of information have been considered adequate by 100% of respondents).

The implemented program has been implemented at € 3,71 per inpatient.

# 6. Implementation of simple cost-effective tests of physical performance for the screening of frail people at risk for physical decline in different clinical settings


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**Background and aims**

A number of studies have demonstrated that simple objective tests of physical performance may identify non-disabled older persons at high risk of functional decline and disability. The four-meter usual waking speed, the balance test and the repeated chair raise tests (Short Physical Performance Battery, SPPB) are among the most studied prognostic tools.

Aims of this project are:

- to diffuse the use of the simple functional evaluation tools in the everyday clinical practice in different clinical settings of the regional healthcare service of the Emilia-Romagna Region;
- to implement more objective tools for walking speed assessment;
- to achieve the rational for the development and implementation of interventions aimed at postponing or preventing functional decline, hospitalization and disability.

**Type of innovation**

- Process and organizational innovations: verification of feasibility and transferability of instruments, validated in epidemiological (Guralnik, NEJM 1995; Studensky JAMA 2011) and clinical settings (Volpato JGMS 2011), to the everyday clinical practice scenario of new assessment tools
- Technological: standardized walking speed assessment (4 and 10 meters test) using accelerometers (actigraphy)

**Scalability-replicability Trasferibility**

The project feasibility is supported by two local experiences conducted in different settings. The first field experience, based on a sample of older patients hospitalized at the AUO Clinical Center in Ferrara (Volpato JGMS 2011), demonstrated that SPPB is predictive of incident functional decline in the 12 months following hospital discharge. The second field experience consists of a sample of 141 community-dwelling (Medesano, Parma) older people (mean age: 78.5 ± 5.5 years, range: 65-91) that were assessed using the six minute walking test, the 4 and 10 meters walking test (with and without accelerometer), the SPPB and body composition assessments.

**Results**

We wish to be able to identify older people at high risk of functional decline and loss of independence, with a better risk stratification and a more efficient implementation of preventive and therapeutic interventions (physical exercise, rehabilitation, and nutritional support) at an early stage and to standardize the process.

# 7. Toward early detection of cognitive frailty in the community: current and future tools and resources


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**Background and aims**

The global epidemiological picture shows a gradual aging of the population with a consequent increase in vulnerable subjects. One of the direct effects of increased life expectancy is increasing the likelihood of developing a neurodegenerative disease whose the most significant symptom is the cognitive impairment. To detect early indices cognitive fragility aimed to large-scale screening, it is necessary to develop affordable and easy to use tools.

The objectives of this project are:

- to implement in ICT devices screening tools such as neuropsychological tests already used in clinical practice;
- to validate tests for the analysis for pathological languages through the automated analysis of spontaneous speech (linguistic corpora) collected in the ecological context

**Type of innovation**

Validation for screening purposes of the following tests, already standardized and widely used in the area as tools for assessment of cognitive impairment: Clock Drawing Test (CDT), MMSE, MoCA, 3O3P, GPCog. In particular, for the CDT, we intend to develop an application for Tablet able to analyze the created image and detect possible early signs of deterioration. Also, you want to insert the GPCog as the first screening tool within Millewin, the software most widely used by Italian GPs, which already has some tests of cognitive and functional assessment (MMSE, SPMSQ, ADL, IADL). Finally, we intend to implement a new screening tool, based on the analysis of the speech: you want to compare the linguistic productions of a group of pathological subjects (MCI, AD initial, full-blown AD) and a control group, recorded and subjected to analysis of computational linguistics.

**Scalability-replicability Trasferibility**

In the case of an actual prediction of the different instruments, they can be used as instruments of fast-cognitive screening (eg for use by GPs), easy to use and low cost, using information technologies for the administration, and the rapid interpretation of data on tablet .

**Results**

Validation of new screening techniques for prevention and early diagnosis of frailty and cognitive decline, through the use and implementation of well-known neuropsychological tests as well as cheap and fast innovative techniques for the analysis of specific language patterns.

# 8. Health and social care database for preliminary evaluation of frailty in the Emilia-Romagna territory


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**Background and aims**

Frailty and its early evaluation have been the main topic of several researches in the past decade. Currently, two main paradigms exist to define frailty: the biomedical and the bio-psycho-social paradigms. As far as the biomedical paradigm is concerned, frailty is defined "a biologic syndrome of decreased reserve and resistance to stressors, resulting from cumulative declines across multiple physiologic systems, and causing vulnerability to adverse outcomes". With regards to the bio-psycho-social paradigm, frailty is "a dynamic state affecting an individual who experiences losses in one or more domains of human functioning (physical, psychological and social), which is caused by the influence of a range of variables and which increases the risk of adverse outcomes".

Aim of this project is to identify and gather preliminary data on frailty in the Emilia-Romagna population. It will encompass several methodologies, including but not limited to:

- filtering and aggregation of pre-existing health-clinical-administrative databases, originally built for other research projects;
- analysis of socially critical situations and extrapolation of common health and working traits helping disease outbreak;
- use of appropriate tools, and their validation, to quickly highlight frailty traits in a population still unknown to social and sanitary services.

**Type of innovation**

Data aggregation and analysis from existing health-clinical-administrative data; analysis and follow up of population according to proper critical areas, for both social and sanitary aims; research and application of validated tools aiding the discovery of frailty traits in a large population still unknown to social and sanitary services; building an up-to-date frailty register, integrated with the regional data-warehouse and fed with real-time population data. This tool will be used to provide current status views, such as personal frailty risk index.

**Scalability-replicability Trasferibility**

Application of experimental analysis tools on much larger population samples; application of experimental models to evaluate and follow-up frailty targets in population samples.

**Results**

Regional database containing data elements and frailty cases detected in the target territory to be used later as the main tool to plan social and sanitary support and interventions.

# 9. Eubiosia Project

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| **Local Health Trust/Institution/ Organisation** | ANT Italia Foundation |
| **Background and aims** | Eubiosia project's main goal is to offer free of charge health and social home care to cancer patients and their families, guaranteeing the most suitable and qualified health care together with the public health system. |
| **Type of innovation** | Home health services provided by ANT Foundation are carried out with a strong medical component, higher than the nursing one and with the important contribution of the psychological staff in supporting the patients and their families.<br>In addition, ANT, thanks to the work of its volunteers, provides social supporting services in order to reduce suffering, discomfort and sense of isolation both of patients and their families. ANT healthcare model contributes to a humanization process of public health.<br>Moreover, an interface of two different IT platforms (public healthcare and ANT) has been created, resulting in a wider healthcare data base. |
| **Scalability-replicability Trasferibility** | The model, developed in the Emilia-Romagna Region, has been replicated in other 8 Italian Regions by transferring the quality standards to the territorial medical ANT teams (in 2012 ANT took care of more than 9.500 patients). ANT's experience and know-how will also allow to transfer this "Best Practice" to the entire European context. |
| **Results** | ▪ The link between NPO (Nonprofit Organizations) and Public Institutions for "Health" as a common good<br>▪ Significant reduction of inappropriate admissions. The ANT model, more specifically the number of home-visits by physicians, seems to favour one's home as the place of death (79%)<br>▪ Significant reduction of health care costs for the community benefit (the average cost for each ANT patient is less than 20 Euros per day) |

# 10. Preventing diabetes complications


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| **Background and aims** | Type 2 Diabetes Mellitus (DMT2) took on a pandemic dimension, with an increase of prevalence that seems not to be influenced by primary prevention interventions. Despite the increasing availability of innovative drugs, DMT2 evolution towards macro- and microangiopathic complications is unmodified. DMT2 is a multifactorial pathology, where environment factors and those associated with life style are primarily involved in prevalence increase and in the development of complications.<br>Several clinical studies documented that persistent changes in life style allow, together with drugs, to prevent or delay DMT2 complications.<br>Systematic education to self-management of diabetes by health professionals favors promotion of patient's self awareness and autonomy, which is essential for the maintenance of metabolic control's index. Objective: to develop systematic health education activities for DMT2 patients through self evaluation process and psychological support. |
| **Type of innovation** | Utilization of the "Conversation Maps" tool to develop a group health education program. |
| **Scalability-replicability Trasferibility** | Health education activities can be carried out using several approaches, often without being assessed in terms of efficacy or standardization. The implementation of a homogeneous approach and the development of group facilitation methods may lead to apply the health education tool in a standardized way, thus allowing to replicate and transfer the methodology. |
| **Results** | The expected results are:<br>▪ definition of uniform application principles of "Conversation Maps";<br>▪ assessment of the effectiveness of the educational group in terms of participation and satisfaction;<br>▪ analysis of some indicators of disease compensation during and after the educational process. |

# 11. Networking actions in the Mirandola Biomedical District


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| **Local Health Trust/Institution/ Organisation** | Democenter-Sipe Foundation (Technologies transfer centers of University of Modena and Reggio Emilia) |
| **Background and aims** | Emilia-Romagna is well-known as the Region of industrial districts. The Regional authorities supported realization of innovative projects through the call "Dai Distretti produttivi ai distretti tecnologici", which financed projects implemented through enterprises collaboration. The initiative involved 35 enterprises, triggering investments for EUR 16,7 million. Democenter Foundation supported this networking program through 2 biomedical-related research projects:<br>▪ ICL (Integrated Compounding Lab), involved B.Braun Avitum Italy and Lean. Project aims at realizing an integrated and multidisciplinary technology platform for pharmacological compounds' automatic production.<br>▪ FARE (Filtration and Adsorption Emilia-Romagna) promoted by Bellco and Medica. The project aims at creating a multidisciplinary-based technological platform for extracorporeal blood clearance.<br>Democenter Foundation supported dissemination by organizing "Distretti Day", an event aimed at spreading the results, where about 180 people, 70 enterprises, 15 authorities, and 6 trade associations participated.<br>Thanks to the successful results obtained during the first edition, Region launched a new call in 2012: "Dai distretti produttivi ai distretti tecnologici - 2". Objective of the initiative is to promote the evolution of the districts involved through the implementation of a novel methodology such as open innovation and design management approaches. |
| **Type of innovation** | These initiatives represent an opportunity and a best practice to create a partnership among enterprises belonging to biomedical supply chain. These networks aim to support research projects through the spreading of knowledge, skills and competencies. |
| **Scalability-replicability Trasferibility** | This experience could be transferred to other Regions and/or Districts where enterprises could create networks to reach new markets. Technologies transfer centers could help to overcame diffidence among enterprises working in the same sectors to carry out joint projects. |
| **Results** | These initiatives give the opportunity to create 8 partnerships among biomedical enterprises and they highlight the relevant role played by technology transfer centers, among which Democenter, as facilitators for creating partnerships between enterprises and Universities and positive effects on the productive district. This way, technology transfer centers support creation of international networks of EU enterprises. |

# 12. A regional network of consulting services for domestic environment adaptation: assessment of social costs related to independence supporting interventions


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**Background and aims**

The Emilia-Romagna Region established a network of innovative services aiming at supporting people with disabilities, as well as the elderly, to live independently, in safety and with a good quality of life. The strength of the experience relies on a systematic review of the impact on social costs.

**Type of innovation**

- The Emilia Romagna Region created an innovative network of local services in all provinces, directly accessible by the elderly and disabled citizens and by Health and Social Services. The Centres for Adaptation of the Home Environment (CAAD) by means of multidisciplinary teams provide information and training, environmental assessment and consulting services for the elimination of architectural barriers, plants adaptations, home automation, furniture and AT devices for daily life functions. CAADs are free of charge resources for citizens wishing to adapt their homes, and a support for local institutions that wish to use public resources more efficiently.
- Following a pilot experience carried out by the Regional Centre for Assistive Technology, CAAD launched a study on social care costs borne by the elderly and disable persons, their families and public authorities. Using the SCAI (Siva Cost Analysis Instrument) the social costs "without" and "with" domestic adaptation action can be compared.

**Scalability-replicability Trasferibility**

A scale leap has already been registered: from Regional Centre for Assistive Technology experiment to tool for the assessment of quality within the regional network of CAAD. The use of SCAI can certainly be extended and transferred to all the organizations offering solutions for autonomy at home and for the quality of life of the elderly and people with disabilities.

**Results**

Initial results indicate that besides increasing quality of life, adapting the living environment to better cope with disability leads to important savings, both in the resources deployed by the family and those committed by local authorities.

A unique sample within Europe (in terms of size) will be analyzed. We expect that results from this analysis will reveal as objective the investments positive economic impact on home adaptation, to ultimately meet citizens needs as well as the need of reducing and qualifying public spending.

# 13. E-care Service in Bologna


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**Background and aims**

The E-care Service, active since 2005, created by CUP 2000 SpA on behalf of the health and social Committee of the Municipalities and Local HealthTrust of Bologna. The E-care Service has developed throughout the years as a network of citizens, associations, institutions and professionals, able to provide support to the frail elderly. The e-Care Service Network aims at:

- favoring the long staying of the elderly in their homes and preventing the increase of not-self sufficient conditions;
- improving the quality of life by fighting social isolation;
- allowing the fruition of healthcare and social services;
- reducing unnecessary hospital admissions.

The target of the service is represented by the frail elderly over 75, at risk of social isolation (single, in a couple, or with weak familiar and social relationships) related to frailty indicators.

**Type of innovation**

The service carries out a constant monitoring of frailty by means of a periodical personalised support and the promotion of lifestyles addressing the improvement of health conditions and adherence to medical treatments. Moreover, the monitoring system, developed by a multidisciplinary team participated also by the social service units of the 9 Bologna Districts, allows the identification and the prompt warning of critical events to the social and healthcare services. The close cooperation of volunteers, associations and institutional operators allowed the success of this service, which has been able over the years to value all the resources available in the territory.

**Scalability-replicability Trasferibility**

The E-care Service can be considered as a reference model for the integrated care and monitoring of the frail elderly. The service can address different levels of frailty, more specifically it can be addressed to elderly with a lower level of frailty. The scaling up of the service and the provision of support to a greater percentage of elderly is sustainable with a large engagement of local organizations and volunteers. The model can be easily transferred and adapted to the different social and territorial contexts.

**Results**

The frail elderly included within the e-Care Service are about 4.5% of the over-75 population of the Province of Bologna. The service has evolved as a complex network system and has put together the social and healthcare resources, providing the elderly with safety, support for social inclusion in order to prevent not-self sufficiency conditions. The further innovation of the services and the integration with new ICT solutions will allow an effective management and prevention of frailty.

# 14. SOCIABLE: motivating platform for elderly networking, mental reinforcement and social interaction


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**Background and aims**

SOCIABLE is a pilot project supported by the European Commission in the frame of CIP-ICT-PSP Programme. It aims to integrate, develop and pilot a novel ICT-based approach for assessment, monitoring, and reinforcement of the cognitive status of elderly people in the early stages of dementia, as well as boosting their social interaction. Project objectives are to:

- pilot and evaluate a radically new ICT-based approach for cognitive training and social activation of elderly people at the early stage of dementia;
- activate and increase the number and quality of social interactions of elderly people;
- provide the medical personnel with automated ICT-based tools for supporting the assessment/diagnosis process and the use/management of patients' data.

**Type of innovation**

Introduction and piloting of a radically new ICT-based approach for the cognitive training and social activation of elderly people at the early stage of dementia, in order to prevent and delay the progression of dementia through enjoyable gaming-like cognitive training activities, specifically designed for elderly people.

**Scalability-replicability Trasferibility**

The novel approach of SOCIABLE has been included among the services provided by the Specialized Memory Centre of the hospital, as an added innovative service for elderly patients affected by dementia. The innovative services introduced by SOCIABLE have been adopted not only within the Hospital of Forlì, but also in collaboration with the Elderly Service of the local Municipality that took part in the project in quality of partner. As for transferability of SOCIABLE, the service has been adopted and validated in different Countries involved in the projects, where it has been tested in medical and social centers for the elderly.

**Results**

The main project results showed that SOCIABLE is an effective intervention for patients in the early stages of dementia, with a significant positive effect on cognitive skills of the elderly affected by Mild Cognitive Impairment (MCI) and Mild Alzheimer's Disease. Moreover, the project has proven to be useful for cognitively healthy elderly as a mean of cognitive decline prevention. Positive results emerged also about the satisfaction expressed by elderly involved in the project. Finally, SOCIABLE services provided health professionals with an innovative and effective tool to be used in their daily activities when dealing with elderly demented patients.