COMMUNITYCARE

Marie Skłodowska-Curie Actions

Research and Innovation Staff Exchange (RISE)
Call: H2020-MSCA-RISE-2020

PART B

"COMMUNITYCARE"

"COMMUNITY RISK MITIGATION PROGRAMS FOR FALLS: IMPACT ON ACTIVE AND HEALTHY AGING AND COST OF LONG-TERM CARE"

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2.1   Quality and credibility of the research/innovation action; level of novelty and appropriate consideration of inter/multidisciplinary, intersectoral and gender aspects
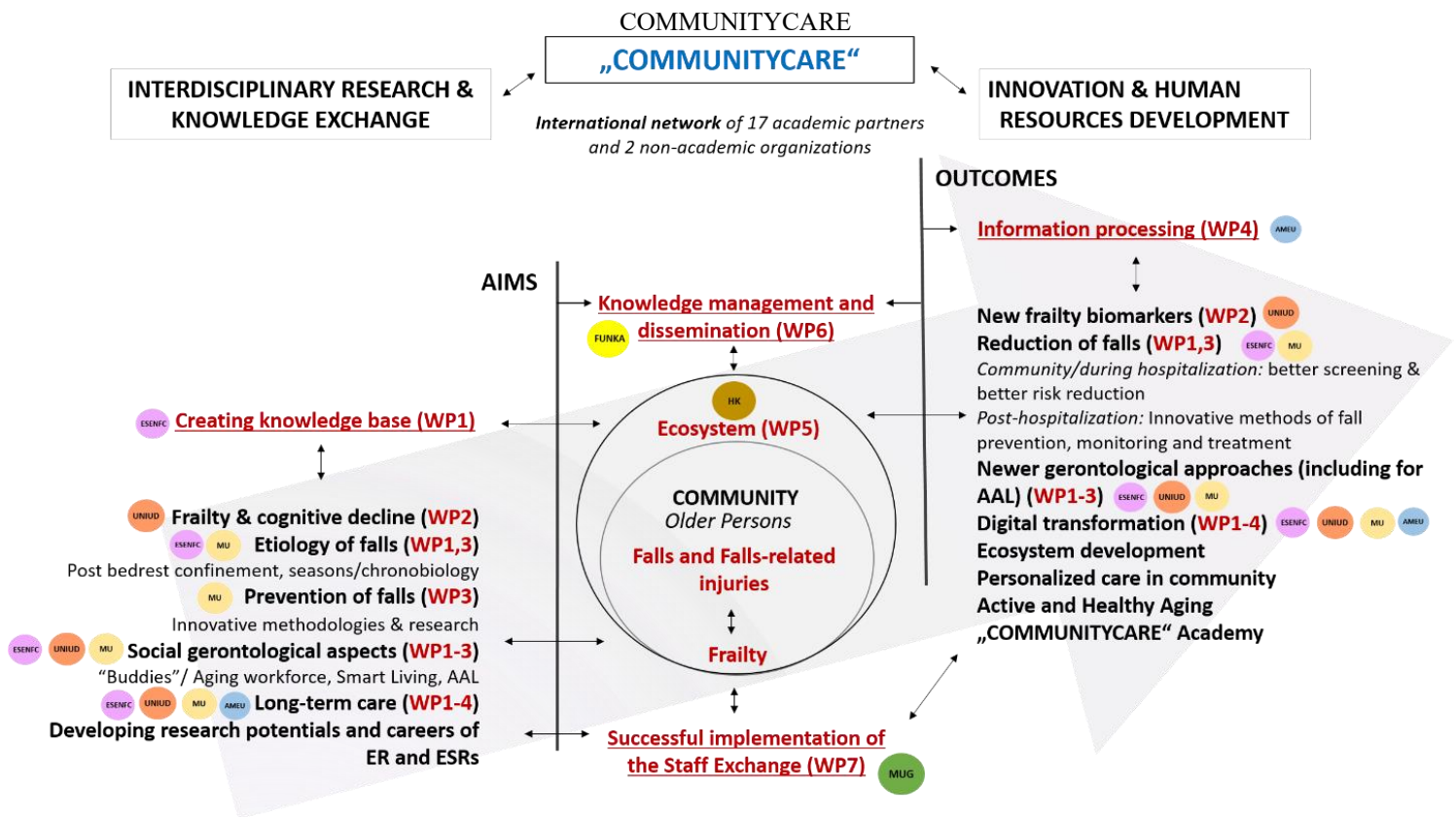
2.1.1. Introduction and state of the art

The project "COMMUNITYCARE: *Community risk mitigation programs for falls: Impact on active and healthy aging and cost of long-term care*" aims to create an innovative and timely Research and Innovation Staff Exchange (RISE) by **developing an international academy**. The COMMUNITYCARE Academy will be made up by **17 academic partners and two non-academic partners,** and be focused on active ageing, frailty and falls. It is based on the knowledge that European countries, together with other economically developed (USA, Canada, Japan) or developing countries (India, Russia, Argentina, Brazil and South Africa) are all experiencing **an increase in older adults with declining functional capacities in communities** and growing number of events (including hospitalization and falls) leading to ill health and disability **which drive demand for long term care in nursing homes.** For the first time, **such ageing population issues and gaps in care will be investigated jointly by European and non-EU countries from several continents**. Global perspectives and solutions are needed when addressing these issues as shown by COVID-19 types of pandemics, which can arise suddenly, and are associated with high mortality, particularly in older persons.

The COMMUNITYCARE Academy represents a network of theoretical and practical expertise that will provide to the new generation of gerontologists, geriatricians, community managers, ICT developers of digital solutions, spatial planners and insurance experts the **necessary knowledge** to understand challenges associated with frailty, falls and support communities with falls prevention systems. In addition, there is a need to develop new aging-friendly communities and environments, which have been up to now designed and validated only in an ad hoc way across several countries. COMMUNITYCARE will break the silos among different disciplines that hinder innovation and contribute to realizing a triple win: (a) better quality of care for populations of EU member states, (b) contribute to more sustainable and more efficient health and care delivery systems in EU member states, and (c) contribute to creation of economic growth and jobs in Europe. COMMUNITYCARE, therefore, adopts a **multidisciplinary** - and **holistic** - approach to achieve several research and innovation objectives:

1) **Innovative approaches and technologies for early detection, diagnosis and screening of frailty in older populations** (WP1: *Building knowledge base for addressing aging and associated functionality and mobility issues leading to falls in a bio-psycho-social context*);

2) Improve the **state of the art related to factors that contribute to frailty and the need to personalize aging care** (*WP2: Translational Molecular and Personalized Medicine*);

3) Enhance **falls risk screening and treatment (rehabilitation) processes** (*WP3*: *Models and methods for efficient fall prevention and rehabilitation in integrated care systems*);

4) Develop **data collection system supporting digital transformation of fall prevention and rehabilitation system** (*WP4: Information processing*)

5) **Create an ecosystem** that brings all the key stakeholders together for raising awareness in the field and stablishing new scientific collaborations (*WP5: Ecosystem creation*);

6) **Disseminate the good practices and evidence** generated in the project at regional and national levels, including creation of educational programs that integrate such gained knowledge (*WP6*: *Knowledge management and dissemination).*

Our project will be the first to bring global scope and perspectives on the complex problems related to the decline of functional capacities of older people with study of risks, risk factors and risk drivers associated with the events leading to falls. Aspects such as addressing problems via emergent digital technologies and systems for fall risk screening (1), fall risk assessment (2), fall detection (3, 4), fall prevention and rehabilitation (5). Application of age-friendly environments and design of community programs for fall prevention and management of ill health and disability will be covered. Attention will be paid to sarcopenia as a study model for molecular description of frailty and adaptation of proper nutritional approaches. The overarching aim, specific objectives and outcomes across WPs are shown in Fig 1.

COMMUNITYCARE

„COMMUNITYCARE"

INTERDISCIPLINARY RESEARCH & KNOWLEDGE EXCHANGE

International network of 17 academic partners and 2 non-academic organizations

INNOVATION & HUMAN RESOURCES DEVELOPMENT

OUTCOMES

→ Information processing (WP4) AMEU

AIMS

Knowledge management and dissemination (WP6) FUNKA

New frailty biomarkers (WP2) UNIUD
Reduction of falls (WP1,3) ESENFC MU
Community/during hospitalization: better screening & better risk reduction
Post-hospitalization: Innovative methods of fall prevention, monitoring and treatment

Creating knowledge base (WP1) ESENFC

Ecosystem (WP5) HK

Newer gerontological approaches (including for AAL) (WP1-3) ESENFC UNIUD MU
Digital transformation (WP1-4) ESENFC UNIUD MU AMEU
Ecosystem development
Personalized care in community
Active and Healthy Aging
„COMMUNITYCARE" Academy

COMMUNITY
Older Persons

Falls and Falls-related injuries

Frailty & cognitive decline (WP2) UNIUD
Etiology of falls (WP1,3) ESENFC MU
Post bedrest confinement, seasons/chronobiology
Prevention of falls (WP3) MU
Innovative methodologies & research
Social gerontological aspects (WP1-3) ESENFC UNIUD MU
"Buddies"/ Aging workforce, Smart Living, AAL
Long-term care (WP1-4) ESENFC UNIUD MU AMEU
Developing research potentials and careers of ER and ESRs

Frailty

Successful implementation of the Staff Exchange (WP7) MUG

Figure 1: Aim and objectives of the COMMUNITYCARE project.

Staff members who participate in the project will **develop new skills**, **be exposed to new research environments** and **have their career perspectives widened.** The experienced researchers (ER) and early stage researchers (ESR) included in this International Academy will share their skills and knowledge allowing all participants to progress towards mastery of key advances in technologies for **risk mitigation of events leading to ill health and disability**. ER and ESR will strengthen skills and contacts for **collaborative research between different countries** and **sectors**. Advances in **risk mitigation of events leading to ill health and disability** will significantly stimulate competitiveness among European technological companies developing solutions for digital transformation of integrated care and Ambient Assisted Living (AAL). These activities will advance the quality of global society by mitigating the expansion of persons dependent on the help of others, by contributing to overall quality of life and well-being of the European ageing population and by improving sustainability of long-term care provision.

State of the art

There is a steep global trend towards demographic aging. It is expected that the number of people aged 65+ years in the EU will almost double over the next 50 years, reaching up to 151 million in 2060 (6), leading to increasing public health costs as well as individual costs for older persons and their families. A central challenge of old age is frailty - a syndrome of functional, cognitive and social impairment, often accompanied with multi-morbidity and compromised quality of life (7). Half of older adults above 80 years in the EU have some kind of functional impairment, and up to 10% of older persons are frail (8). In addition, older persons are often bed confined as a result of injury or illness and bedrest immobilization itself can precipitate or exacerbate functional decline, resulting in greater health vulnerabilities such as risk of falls and risk of new health problems (9).

Frailty is a broadly defined term incorporating a number of factors including bone fragility, muscle weakness, reduced exercise tolerance, risk of falling and injury, diminished nutritional status (10), vulnerability to infections (11) and diseases and delirium, blood pressure instability, reduced cognitive and physical functioning and social interaction (7, 8, 12). Despite "frailty and functional decline" being often considered synonymous, frailty reflects a very heterogeneous status in which different conditions and diseases coexist, with significant negative consequences for the families, caregivers and the society. Notably when incorporating chronobiologic principles (13, 14), coordinated interventions from different disciplines, such as medicine, nursing, social care, dietetics, physiotherapy, occupational

therapy, psychology and sports medicine, as well as support by communities, are needed to avoid functional decline and frailty in the older population, and to strengthen health and health competence over the last decades of human life. Given the aging population and the burden of complications from age-related diseases such as cardiovascular and pulmonary diseases, cancer, dementia, visual impairment and hearing loss (often occurring in combinations), frailty and functional decline are now the main topics in the EU program Horizon 2020, the Global Action Plan on Aging and the new WHO Food and Nutrition Action Plan (15).

Sarcopenia (decreased muscle mass and strength, within a progressive and generalized skeletal muscle disorder that is associated with increased likelihood of adverse outcomes including falls, fractures, physical disability and mortality) impairs ambulatory function. A combination of sarcopenia and disuse atrophy causes profound muscle wasting. This deconditioning process poses a medical risk in itself, that causes numerous adverse events such as obesity and low-level inflammation of adipose tissue, decreased insulin sensitivity, reduced "cardiorespiratory fitness", reduced exercise tolerance, and impaired quality of life. Sarcopenia is characterized by an imbalance of redox status of the cells that can be monitored by peripheral levels of oxidative stress biomarkers, determining a cell senescence phenotype that can be quantitatively evaluated. Consequently, **preclinical frailty can indeed be monitored at the molecular level** and evaluated in terms of functions through non-invasive evaluation tools of muscle function and metabolism, such as salivary biomarkers or engineered molecular probes for imaging techniques or selective detection of biomarkers which should be identified and validated, to be ideally utilized in the general elderly population. Hence, a number of objective variables could be used as a predictor of adverse health outcomes in the older population and as a therapeutic target for muscle-building interventions. In terms of oxidative metabolism, these tools can span from systemic to the skeletal muscle levels and can be associated with more invasive measurements performed in selected aged populations or in animal models. Senolytic therapy, an emerging strategy to promote senescent cells replacement, is currently in clinical trials for age-related diseases such as sarcopenia. Other lines of research, related to the prevention or treatment of sarcopenia, concern the development and validation of innovative approaches for exercise prescription in association with nutritional interventions, and for the evaluation of exercise tolerance. Geroprotectors (substances targeting cellular senescence such as melatonin) are actively being researched by our partners to help with healthy aging. In this context, maintaining a robust circadian system has emerged as a worthwhile core strategy (16).

The **longitudinal monitoring of psychophysiological variables** can also gauge the cognitive and functional health status of the elderly. *Cognitive aging* is an innovative approach that significantly contributes to both early identification of elderly individuals with increased risk for frailty and development of preventive interventions. Some of the partners of the project have previously shown that non-physical approaches are highly recommended for individuals with limited or complete inability to perform physical exercises (17). Even in cases of prolonged periods of hospitalization, non-physical approaches, such as cognitive training, could be implemented to mitigate bedrest-related decline (18) as well as to enhance mobility-related outcomes (19).

A key aspect of frailty is that it reflects "vulnerability" of older subjects to a sudden change in health status after a minor stressor event such as minor illness, drug adverse effect, or environmental or social stressors such as a change of home situation. This can lead to a larger than expected deterioration in functional capabilities, which can manifest as functional dependency and a non-return to baseline homeostasis and reflects a **lack of built-in reserves to cope with stressors** associated with an **increased risk** of numerous health adverse effects, including dependency, gait disorders, falls and hospitalization. As hospitalized patients spend up to 80% of their time in bed, patients leave the hospital in worse shape than when they were admitted and this has been identified as a risk factor for falls (20, 21). Forced bedrest induces deconditioning and predisposes patients to falls. **Research in this area is completely lacking**. There is an **urgent need to screen patients about their health status (frailty score) and risk of falls at hospital admission, during hospitalization and at discharge/ return to communities.** Falls do not occur at random times. Instead, their occurrence follows predictable patterns along the scales of the day, week, and year. A better understanding of these patterns will better inform cause and guide implementation of countermeasures. There is strong evidence that several key factors contribute towards healthy aging in older citizens. These include: i) nutrition and nutritional care combined with physical activity (22-25), ii) compliance/adherence to programs promoting health, especially as older people may be less receptive to interventions, which do not match their preferences (26-30); and, iii) inclusion of older people in general social activities, such as professional work, voluntary activities, family life, as well as a sense of duty towards disabled fellow older persons (31-35) - which is an under-appreciated factor. Within this bio-psycho-social framework, lifelong learning and a sense of belonging/importance play essential roles in achieving a healthy later life (36).

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Overall, there is a need to develop strategies to support compliance with prescribed medical, as well as healthy lifestyle advice (e.g. increased physical activity, improved nutrition) when living independently, during hospitalization care, and during post-hospitalization community re-integration. This involves **tailoring fall prevention interventions to community settinsg and social support ("Buddy" system)** to encourage regular follow through on prescribed behavior and lifestyle changes that promote healthy aging and prevent falls (37). These fall prevention strategies should be integrated into the micro-, meso- and macro- levels (patient, community, health policy planning), thus taking a global perspective that incorporates all phases of geriatric care as related to frailty, falls prevention and healthy aging. These aspects also require support structures and approaches which combine social dimension and social innovation research. Such approaches play pivotal roles in self-identity issues such as vulnerability to falls after hospitalization and in **promoting health literacy and health education** within a social context, supporting **patient health empowerment** and encouraging active and healthy aging. Some COMMUNITYCARE partners have specific expertise in social gerontology—and development of "Buddies" programs—that will be utilized in this project.

Three **types of technologies** have been developed in more that **100 EU funded projects**: 1) Digital technologies for fall detection (38), 2) fall risk assessments and 3) physical and cognitive exercises mitigating the risk of falls. Despite being effective in theory, these technologies are not yet fully implemented, or have not been maximally utilized, especially in communities. Certainly, usage of such devices differs across regions, not just in the EU but worldwide. Factors such as cultural aspects, health literacy, and societal values and norms often limit the potential of emerging technologies. For risk mitigation technologies to be effective at community or even regional level, ecosystems for fall prevention and rehabilitation need to be developed using common standards that currently do not exist. **Research is again lacking** in these respects and there is a need to carry out further studies together with social gerontologists, medical anthropologists and community social workers to understand the underlying factors that prevent maximal utilization of such innovative technologies. Several of the partners in this project are social gerontologists.

Over the last few months, there has been a worldwide rise in infection with Coronavirus disease (COVID-19). European populations have been particularly affected with thousands of COVID-19 associated deaths in several countries. Currently, there is still a growing number of cases of the infection with a higher mortality rates associated with individuals ≥ 70 years. If any negative health conditions break the equilibrium, such as the COVID-19 pandemic, the irreversible downward spiral of frailty will begin, especially in older patients with specific comorbidities (6). In addition, the increasing need for elders to move to homecare or nursing homes is constantly rising within the current pandemic. Moreover, elderly people with restricted mobility due to quarantine or lockdown should be assessed in order to reduce the risk of frailty, sarcopenia, cognitive decline and depression (7). There is increasing evidence of a **general need to characterize emerging disabilities in Covid-19 survivors and adverse effects of lockdown or quarantine** on the health of chronically disabled people, possibly through specific clinical and biochemical risk markers. *Potential for scientific breakthroughs - Going a step further with COMMUNITYCARE*

COMMUNITYCARE identified the following gaps in current literature that will be addressed in the following way: Currently, primary health care as well as institutionalized care for older persons in most countries is an under-resourced area of practice. Many individuals do not receive a comprehensive geriatric assessment (CGA) to determine individual therapeutic and rehabilitation potential, frequently resulting in failure to recognize the complexity of their health issues as well as functional and social care needs. **Early detection and treatment of frailty (39)**, though of high economic impact, are not yet considered in the health care processes of either acute or community care in most countries. Therefore, there is an **urgent need to improve individualized comprehensive assessment of health and physical and mental functional status of older persons at different care levels.** Such an approach will lead to personalized and more effective procedures to maintain healthy aging, will enhance fall prevention, and will integrate all bio-psycho-social dimensions to limit functional-cognitive decline (FCD) (40, 41). In particular, **person-centered evaluations (42)** will reflect various stages in the aging process and will enable health/social professionals to **address the effects of immobilization in acute care as well as in community settings.** Furthermore, the **prescribed fall prevention guidelines** derived from such assessments are expected to secure the participation of older people via **self-empowering behavior/ activities** enabling them to remain involved in meaningful activity and in a **healthy lifestyle (43, 44)**.

Based on a sample of over 200 hospitals from across Europe, every year, 3.8 million older people present to emergency departments with a fall-related injury; of which 1.4 million are admitted to hospital for further treatment. Critically, the actual number of fall-related presentations and admissions are likely to rise significantly due to current inadequacies in many hospital data collection systems. Furthermore, without additional fall prevention efforts, the annual number of fall-related emergency department attendances is expected to increase to over 6 million by 2050, with more

than 2.3 million cases admitted to hospital with subsequent long-term care. If this trend continues, the number of people in Europe relying on the help of others will increase by approximately 260,000 per year until 2070 eventually reaching 32 million, as reported by Ageing Report 2018 published by the European Commission (45). The EU has set itself strategic objectives towards active and healthy ageing and development of community care, and increasing participation of older adults in the society. Thus, **a new generation of age-oriented community models and methods needs to be created** and theorized for future long-term care systems in order to prevent frailty and decline of (physical, cognitive and social) functional capacities of residents. Such aspects must be considered when outbreaks of diseases occur rather suddenly such as **the still active COVID-19 pandemic** that has led to high mortality in older persons, especially those living in communities and nursing homes. Consequently, the lockdown experienced in many countries socially isolated very old people, which, in turn, inevitably triggers a vicious cycle of worsening of frailty (46). **Coordinated and united action of different disciplines**, such as medicine, nursing, social care, food science, nutrition, physiotherapy, occupational therapy, psychology and sports medicine as well as support by communities, is needed to avoid functional decline and frailty in the older population and to strengthen health and health competence over the last decades of human life. However, **practical limits arise** and a **complete re-thinking is needed** regarding: i) community development with integration of active and healthy ageing (47); ii) fall prevention and rehabilitation programs; iii) development of age-friendly environments; iv) specialized housing stock for older adults (48); v) community age management strategies and vi) digital transformation of long-term care systems design and management (49). To achieve this rethinking process, a uniform **community risk management framework should be developed;** COMMUNITYCARE emphasizes and integrates such approaches.

In addition to monitoring the risk of falls in the community post-hospitalization, the development of community fall prevention and rehabilitation programs and age-friendly environments in the context of **community active ageing initiatives are required**. These programs and initiatives need to be supported by smart solutions including embeded ambient intelligence for support of integrated care. There is a well-established body of research on the relation between environment and health, decline in functional capacities and associated risk of events leading to ill health and disability (like falls), as well as age-friendly environments and ambient technologies able to detect falls and other types of accidents. Therefore, there is a need to better explore different age-oriented design options to evaluate human performance and understand the complex linkage between assistive technologies and the individual using these technologies. This will help sustain European long-term care systems and reduce the risk of events leading to ill health and disability and falls. European Member states are currently sponsoring national initiatives such as, **AAL projects, to further research of smart systems supporting autonomous and independent community living of older adults.** However, the development of assessment methods that would measure efficiency and effectiveness of such systems is lacking. It is essential to ensure that smart technologies, systems and software within a value chain allow for **flexible and efficient integration into approaches supporting older adults. These tools should be functional as part of community development, as well as be acceptable to social care and medical professionals,** who are the main experts of the processes related to dynamics of functional capacities and development of frailty in older adults (50, 51). Another under-researched area is how smart systems forestall and compensate functional decline and development of frailty, prolong community living and postpone relocation to nursing home. In particular, AAL technologies and Ambient Intelligence will become tools to reduce physical and cognitive functional decline and cognitive stress in older community living adults and will also decrease demand for institutional care. Artificial intelligence approaches are particularly powerful to provide solutions for highly multidimensional problems. All these latest generation technologies, if effectively applied and correctly designed, have a great potential to preserve the wellbeing, quality of life and safety of the older adults by mitigating physical, cognitive and social risks associated with ageing and by empowering older adults with declining functional capacities to have autonomous and independent lives. For example, research and commercialization of AAL technologies supporting independent and autonomous living in community for persons with reduced or declining functional capacities has been promoted through the European Partnership for active and Healthy Ageing, and EIP on AHA. This foundational concept of active and healthy ageing incorporated into the vision of the future of long-term care will promote the efficient design of future age-oriented communities. Supported by age-friendly environments in which humans and AAL system interact and reinforce each other, this will lead to development of new smart age-friendly environments in which human, technical and environmental factors are integrated into structures and strategies which can be effectively embraced and implemented by community managers. Community and long-term care systems, however, are not currently age-oriented designed or managed. Moreover, there are **different country-specific practices and protocols regarding the application of AAL technologies** and smart home solutions (52), but the

implications of such equipment for humans and the interrelationships between humans and Cyber Physical Systems have not been adequately investigated. There is a **lack of comprehensive research using assessment tools and combining assessment with risk realization (falls).** COMMUNITYCARE aims to assess this with project partners and key stakeholders (e.g. AAL, is collaborating and contributing towards dissemination of good practices).

2.1.2 Specific objectives and the relevance of the research and innovation action

This project aims to **create an international academy on fall prevention and rehabilitation in the context of active ageing.** Integrated care of older persons needs to take into account the risk of frailty and loss of physical activity and mobility, functional and cognitive decline, malnutrition, and risks related to the consequences of hospital induced bedrest, all of which interact to greatly increase the risk and incidence of falls. Such integrated care approaches will translate directly into healthy aging strategies. Best care practices as well as development of effective tools, and social support that promote healthy aging will accomplish these results, bringing together an interdisciplinary spectrum from screening and health assessments to practical health guidelines in an context. Innovations in IT, including data acquisition, remote sensing and diagnostic tools, and wearable monitoring technologies will be vigorously pursued.

Additionally, to support return to enhanced mobility, prevention of falls, and improved quality of life, we will seek out knowledge related to falls in all phases of hospitalization and recovery beginning with the admission (including screening), continuing with immobilization care during hospitalization, and followed by recovery in the community. Screening approaches and categorization (ontology) structures will be constructed and implemented in hospital care and extended to community-based follow-up care and prevention strategies that prevent falls, support mobility and physical functioning in community. The key performance indicators (KPI) will be re-hospitalization, social participation, the capability of self-care, and number of falls. Finally, in addition to the scientific impact, there is a need to develop an enabling health care ecosystem, which links and effectively integrates professional stakeholders in aging-related issues and treatments. Such an ecosystem should be established long-term to support geriatric care, especially in the area of monitoring and preventing falls following bedrest confinement and discharge into the community.

COMMUNITYCARE will bring together 9 European universities with leading expertise on ageing, ergonomics, long-term care system design and assistance technologies, and 8 Third country (TC) universities (located in countries with different levels of economic development and with increasingly high level of life expectancy and an increasing ageing population) with great expertise on the same topics in order to **create a new generation of knowledge extending understanding of falls and furthering the creation of age-friendly environments and support systems, paradigms, models and methods for active and healthy ageing, preventing falls, and long-term care systems** (Figure 1). In addition, two **non-academic partners,** a small to medium enterprise (SME) consultancy focusing on dissemination activities (FUNKA) and another one on creation of ecoystems and aging policies (HTS) will participate in this project. Both will **support an effective dissemination of the results to a large public and political bodies.**

The academy developed by COMMUNITYCARE will create a worldwide partnership and network, in which staff exchanges between Academy partner institutes will offer an opportunity for review of existing literature and practices from different countries regarding frailty, effects of bedrest confinement and falls risk in the community. Included here will be dimensions such as real data collection, distribution and sharing of knowledge and good practices, innovations exchanges, theory building, early stage researchers (ESRs) training opportunities and new outcomes dissemination at a worldwide level. The COMMUNITYCARE Academy will boost scientific excellence and business innovation and enhance exchange of researchers' ideas while improving their skills in networking, creativity and innovation.

2.1.2 Methodological approach

The research methodology adopted by COMMUNITYCARE will ensure the integration of the partners' research outcomes into a coherent and cohesive whole, a key goal of the design and structure of the project. The COMMUNITYCARE is structured in seven WPs. The first five are dedicated to the research activities and the last two focus on knowledge dissemination and project management. WP1 -WP5 are supported by at least four partner organizations and coupled with a specific set of planned secondments. **The secondments assigned to a specific WP have all strong scientific links** and the human resources involved in these secondments will deeply cooperate during the project supported by a **strong interaction between senior researchers and ESRs and reinforced by the secondments plan from third countries (TCs) to European partners** (Figure 2).

The first five WPs will apply an effective research approach that will be extended to the whole network, through all partners (beneficiaries and not) with the final aim to assure the identification of real community and long-term care system problems and challenges. This approach is based on the strong involvement of local hospitals, community health centers, home care providers, housing providers and nursing homes in the project activities in order to derive insight and to collect real data from real health care settings and environments. These data will then be shared and analyzed during secondments. New age-oriented models and methods will be further developed during secondments.
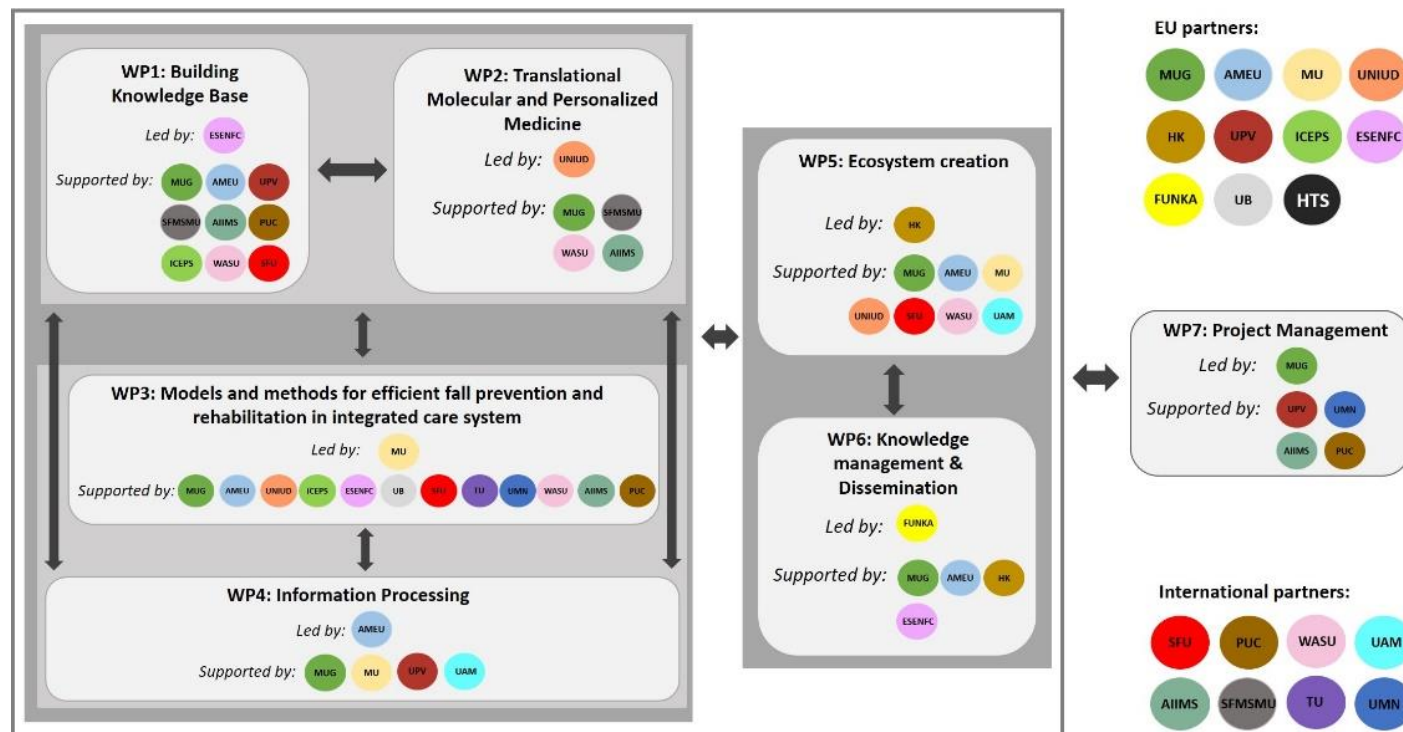
Figure 2: Overview of WPs, their relationships and the partners involved in each WP. **While all the partners will play active roles in all the WPs,** shown here are key partners involved in each WP.

Testing and validation of such methodologies will be carried out when feasible, in specific use cases inside local hospitals, community health centers, home care providers, housing providers and nursing homes.

Table B1 – Work Package (WP) List

WP Nr	Title	Activity Type	PM involved	Beneficiary leading	Start Month	End month
1	Building a knowledge base for addressing aging and associated functionality and mobility issues leading to falls in a bio-psycho-social context	Research, training and knowledge transfer	25	ESDEDC	1	36
2	Translational Molecular and Personalized Medicine	Research, training and knowledge transfer	46	UNIUD	1	36
3	Models and methods for efficient fall prevention and rehabilitation in integrated care systems	Research, training and knowledge transfer	181	MU	1	36
4	Information processing	Research, training and knowledge transfer	33	AMEU	1	36
5	Development of Ecosystem for an Active Ageing	Research, training and knowledge transfer	24	HK	6	36
6	Knowledge management and dissemination	Dissemination	42	FUNKA	1	36
7	Project management	Management	13	MUG	1	36

2.1.3 Inter/multidisciplinary types of knowledge involved

COMMUNITYCARE will break the silos among different disciplines that hinder innovation in Active and Healthy Ageing. It will contribute towards realizing a triple win: (a) better quality of care for populations of EU member states, (b) contribute to more sustainable and more efficient health and care delivery systems in EU member states, and (c) contribute to creation of economic growth and jobs in Europe by incorporating for the first time a **unique set of complementary competences and skills** to facilitate the sharing of knowledge and networking activities for the

strengthening of current personal relationships within the research area of age-friendly communities and environments. The **interdisciplinary approach** will be assured by the combination of 17 academic partners having expertise in the fields of medicine, public policy, ergonomics, ageing, long-term care system design, operation and supply chain management, health economics, artificial intelligence and assistive technologies. COMMUNITYCARE will analyze primary sources key for initial desk research and secondary sources and existing repositories of good practices (EIP on AHA repository of good practices, CHRODIS good practices, etc.) and digital solutions (AAL database of solutions, *DigitalHealthEurope* CSA reporsitory of user-centred solutions, etc.) to guide the methodological overall approach in the kick-off process of each Work Package.

2.1.4. Gender equality

Gender Aspects will be managed according to the principles of GA (Article 33.1 "Obligation to aim for gender equality"). The partners will take all measures to promote equal opportunities between men and women in the implementation of the project, aiming, to the extent possible, for a gender balance at all levels of personnel assigned to the project, including at the supervisory and managerial level. The gender balance of the project is planned as follows: The EU based researchers are 16 females and 12 male participants. Regarding participation in decision making – the main contacts for the participating organizations are 3 females and 16 males, and the members of the Advisory Board are 2 female and 2 male participants. As new researchers get involved in the project, the gender balance will be one of the criterions for selection. Gender balance (50/50) will also be a leading principle when recruiting young and old participants in experimental studies. Current data show that gender aspects are important when studying not just physiological responses but also when carrying out research in age-friendly environments and community care (53). Current evidence suggests that retirement villages can boost the longevity of women by as much as five years (8, 31). In general, therefore, differences in gender resposnes will be taken into account when interpreting data from the ongoing projects at the partner laboratories. As many of these studies are carried out on older persons, in the labs and in communities, it is important to examine gender aspects in disease incidence (e.g. osteoporosis is more common in older females), falls and disease outcomes in both ambulatory older persons and those in long term care.

2.2 Quality and appropriateness of knowledge sharing among the participating organizations in light of the research and innovation objectives

COMMUNITYCARE aims to create a new Academy and network that can create and disseminate new knowledge regarding development of fall prevention and rehabilitation programs in age-friendly communities and environments design methods for elderly care systems. To identify the weaknesses of the European system, a situational analysis of how non-EU countries are facing the problem of ageing populations is mandatory. The most efficient method to achieve this kind of **knowledge sharing is by immersing people in other systems. This will be implemented through secondments from Europe to TCs and from TCs to Europe.** The COMMUNITYCARE plan of secondments will provide a unique opportunity to **exchange knowledge** on "risk mitigation for ageing in community" at an international level, to i**mprove researchers' skills**, to **foster interdisciplinary cooperation between research groups and to disseminate knowledge at large**. The core **training objectives** are:

1. To constitute a pool of interdisciplinary experts in the fields of risk mitigation for aging in community involvement in European communities and long-term care provision realities – active and healthy aging realities. In particular, topics such as fall prevention and rehabilitation system modelling, collaborative technologies, ergonomics and economical tools will be developed through the training.

2. To promote opportunities for international knowledge exchange, European networking, professional and academic secondment, research experience and for international career development.

3. To develop European academic and career skills, in accordance with individual research projects/ specific research themes, through partners involvement and cooperation.

4. To increase the cooperation and collaboration between multiple and interdisciplinary sectors, academic and professional realities, and between different European countries.

To this purpose, network-wide workshops and meetings, latest generation knowledge transfer methods and a website together with several social media channels will be developed and used by the COMMUNITYCARE partners in order to permit a fluent and efficient exchange of information inside the COMMUNITYCARE Academy. All academic staff, from PhD students to professors, will be engaged in the planned secondments form Europe to TCs and vice-versa. Figure 3 below shows the secondments in COMMUNITYCARE.
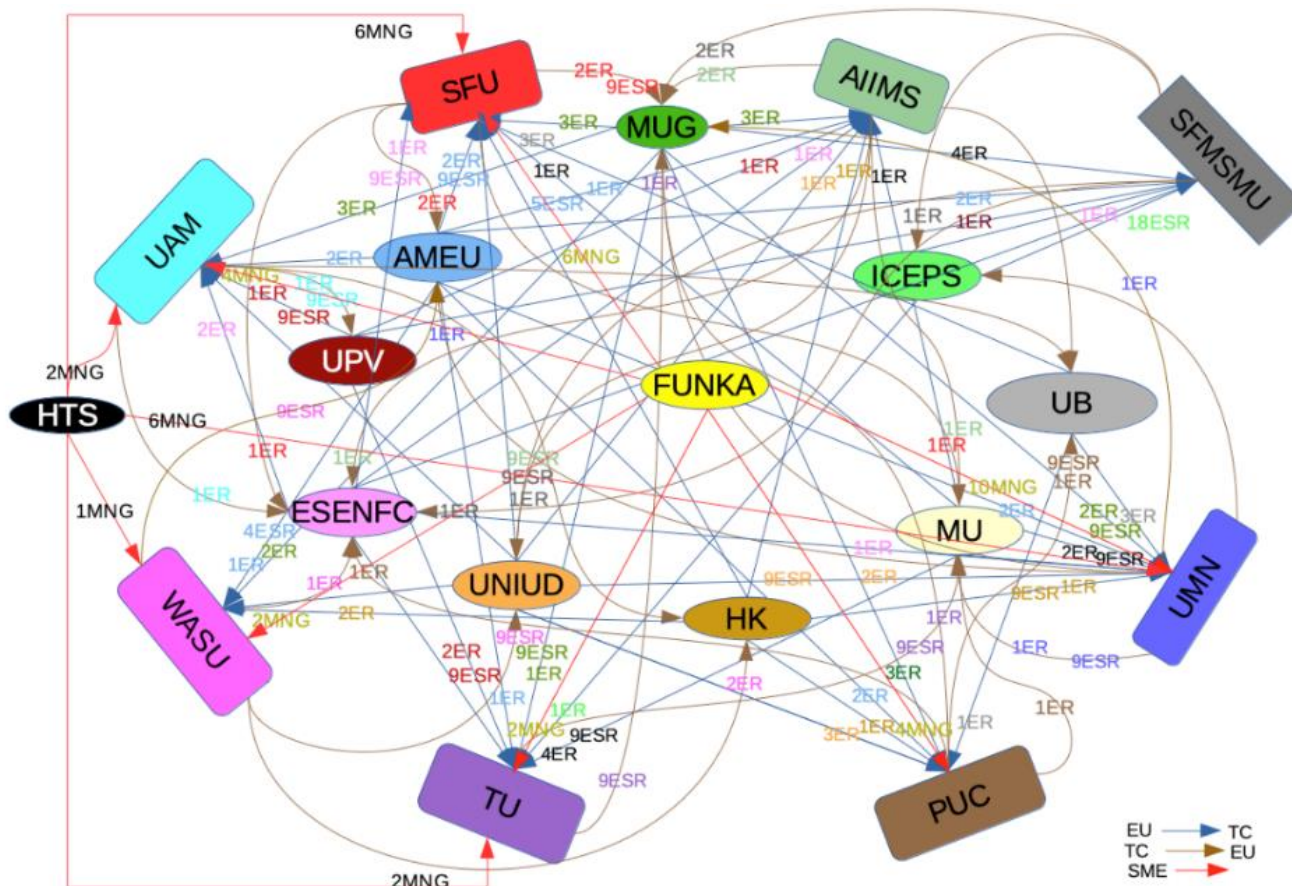
Figure 3: Overview of secondments. The number preceding type of secondee depicts duration of secondments.

Moreover, a training program for research streams (WP1- WP5) will be developed <u>by each WP leader</u> by the end of the third month of project and deliberated on by all partners on month 4, and then managed and monitored by the WP leader. COMMUNITYCARE Academy knowledge sharing structure is as follows:

Secondments for ERs: Each ER belonging to the COMMUNITYCARE Academy will make minimum 1 month of secondment. During the secondment periods, the research objectives will be achieved via a day by day cooperation between the secondees and hosting partners. There will be organized specialized seminars, lectures for doctoral students, presentations to the permanent staff of the hosting institution, laboratory testing, dissemination and outreach events to facilitate both the training and knowledge sharing during the secondment periods.
Secondments for ESRs : All the ESRs involved in secondments (from 1-3 PhD students per beneficiary) will be co-supervised during secondments by supervisors belonging to the hosting institution and the ESR. Individual research projects will be shared between partners before the secondment period and agreed by both partners. The project results will be evaluated jointly. Each WP will involve minimum 2 PhDs, who will be co-supervised by both partners (sending institution and host) thus providing a truly international experience for the ESR.
Training program: The project research activities will result in several doctoral projects. In particular, a minimum of 1 PhD student per each beneficiary partner will be fully involved in the COMMUNITYCARE Academy and will benefit from an international training program made up by generic, specialized and soft skills courses. Each ESR will follow an individualized and local training that will be provided by each Doctoral Program according to the guidelines defined by the teaching committees of each Doctoral School. Moreover, a specific training program during the secondments will be assured by the COMMUNITYCARE Acaemy by providing to ESRs a set of scientific courses and seminars at the hosting university. The ESR's main supervisor from the sending institution will be responsible for planning efficiently the local training of the ESR by organizing also local research training activities. These activities will be shared with all the ESRs involved in COMMUNITYCARE, by using webinars and e-learning tools. The list of all available local training activities will be provided on the project's website and be continuously updated by the coordinator (MUG) in order to encourage all ESRs involved in the project to attend international seminars. During secondments, senior researchers will hold seminars on specific topics at the hosting university. The same will be done by professors from TC countries when visiting the beneficiary universities. Hence, the COMMUNITYCARE Academy is a unique possibility to create for the first time an interdisciplinary training program on "Risk Mitigation in Active Ageing".
Conferences/ workshops/ dissemination events: COMMUNITYCARE Academy will plan and create sponsored events by organizing and chairing special sessions at international conferences in order to disseminate the results obtained in WP1-5 to the scientific community at least

once a year. Conferences will also offer the opportunity to organize project meetings with the partners. A final workshop opened to academics and practitioners will be organized in order to conclude the project with an international event with a high level of visibility. Moreover, FUNKA will have a strategic role in the Academy to create dissemination events with a large impact on stakeholders and practitioners of the key AHA related communities, such as EIP on AHA, AAL and JPI More Years Better Lives, as well as organizing webinars for the seconded staff and open to the scientific community in the countries participating in the project and beyond.

Annual Meetings and teleconference calls: One project meeting per year will be organized in order to make an oral presentation of deliverables and a final validation of deliverables results. In the annual meeting, there will also be invited focused group of stakeholders, mainly practitioners, politicians, community leaders, safety and human resource managers and ergonomic experts (detailed in Milestone M2). One videoconference call will be organized by the coordinator (MUG) each month to ensure smooth running of the project and to ensure that objectives are being met and for early identification of risks or to mitigate any issues that may arise.

Project Website : The website will be used to communicate project information, share scientific results, foster joint consortium initiatives, and publish relevant documents, reports and dissemination materials. This website, developed by FUNKA, will become the cornerstone for the communication and dissemination and will be supported by social network activity and an electronic quarterly newsletter.

Table: Secondments (*Legend:* DI: Data Integration; KB:Knowledge Base; KT: Knowledge Tansfer; Ger:gerontological; INNOV: Innovations; PM: Project Management; TM: Transfer Mechanism; DP: Data Presentation; DA: Data Analysis; FP: Fall prevetion; FR: Frailty; DIS: Disemination; AC: Aging Care; FM: Frailty Markers; SGA: Social Gerontological Approaches)

ReN	Typ	From	To	WP	T	D	Purpose	TM	reintegration mechnism
1	ER	MUG	SFU	3	6	1	Formulating project strategies	RW	Delivering workshop in SO
1	ER	MUG	AIIMS	2	18	2	Innovative solutions	RW	Delivering workshop in SO
1	ER	MUG	SFMSMU	5	33	1	Ecosystem development	RW	Contacting key stakeholders
2	ER	MUG	UAM	2	9	1	DI across studies	RW	Technical report
2	ER	MUG	WASU	4	33	1	Knowledge Transfr	RW	Delivering workshop in SO
3	ER	MUG	UAM	2	6	1	DI across studies	RW	Technical report
3	ER	MUG	SFU	2	14	1	Innov methods in DA	RW	Contacting key stakeholders
3	ER	MUG	SFMSMU	5	30	1	Ecosystem development	RW	Contacting key stakeholders
6	ER	MUG	PUC	1	9	1	Creating knowledge base	RW	Delivering workshop in SO
6	ER	MUG	TU	5	28	1	Ecosystem development	RW	Contacting key stakeholders
7	ER	MUG	SFMSMU	4	23	1	DI across studies	RW	Delivering workshop in SO
1	ER	MUG	PUC	6	9	1	DP and education outreach	RW	Contacting key stakeholders
1	ER	MUG	UAM	7	14	1	PM related discussions	RW	Project report to be shared
1	ER	MUG	AIIMS	7	20	1	PM related discussions	RW	Project report to be shared
1	ER	MUG	WASU	7	24	1	PM relatd discussions	RW	Project report to be shared
1	ER	MUG	SFMSMU	7	3	1	PM related discussions	RW	Project report to be shared
1	ER	MUG	PUC	7	10	1	PM related discussions	RW	Project report to be shared
1	ER	MUG	SFU	7	13	1	Planning of outreach activities	RW	Project report to be shared
2	ER	MUG	UMN	3	20	1	innov approaches in DA	RW	Technical report
7	ER	MUG	UMN	4	9	1	DA methodologies discussions	RW	Publication drafts
8	ER	AMEU	TU	4	9	1	Innovative solutions	RW	Technical report
8	ER	AMEU	PUC	4	11	1	KT	RW	Contacting key stakeholders
8	ER	AMEU	UAM	4	14	1	DI across studies	RW	Seminar open to Department
8	ER	AMEU	AIIMS	4	16	1	KT	RW	Contacting key stakeholders
8	ER	AMEU	SFMSMU	4	18	1	DI across studies	RW	Technical report
9	ER	AMEU	UAM	1	6	1	Formulating project strategies	RW	Delivering workshop in SO
9	ER	AMEU	WASU	5	18	1	Social ger. approaches in AC	RW	Contacting key stakeholders
10	ER	AMEU	PUC	4	9	1	Big Data Integration	RW	Technical report
10	ER	AMEU	SFMSMU	4	27	1	Big Data Integration	RW	Technical report
8	ER	AMEU	UMN	4	5	1	Big Data Integration	RW	Technical report
9	ER	AMEU	UMN	6	26	1	Development of guidelines	RW	Seminar open to Department
13	ER	MU	TU	3	4	2	KT of rehabilitation practices	RW	Delivering workshop in SO
13	ER	MU	TU	3	6	1	Knowledge Transfer	RW	Seminar open to Department
13	ER	MU	AIIMS	5	30	1	Ecosystem development	RW	Delivering workshop in SO
14	ER	MU	TU	3	15	1	Rehabilitation strategies KT	RW	Delivering workshop in SO
14	ER	MU	SFU	6	22	1	DA and dissemination strategies	RW	Publication drafts

13	ER	MU	UMN	3	16	1	innovative approaches in DA	RW	Technical report
14	ER	MU	UMN	3	5	1	innovative approaches in DA	RW	Seminar open to Department
17	ER	UNIUD	PUC	2	13	1	Technology transfer	RW	Seminar open to Department
18	ER	UNIUD	AIIMS	2	21	1	Technology transfer	RW	Delivering workshop in SO
62	ER	UNIUD	PUC	7	8	2	FM research at molecular level	RW	Project report to be shared
17	ER	UNIUD	UMN	2	10	1	KT about frailty	RW	Seminar open to Department
61	ER	UNIUD	UMN	6	25	1	DA and dissemination strategies	RW	Seminar open to Department
21	ER	HK	AIIMS	5	13	1	Ecosystem development	RW	Contacting key stakeholders
21	ER	HK	PUC	5	25	1	Ecosystem development	RW	Contacting key stakeholders
63	ER	HK	WASU	6	15	2	Preparing data for DIS	RW	Publication drafts
21	ER	HK	UMN	3	17	1	KT of falls etiology	RW	Workshop for RG
25	ER	UPV	UAM	1	3	1	KT about data analysis	RW	Delivering workshop in SO
25	ER	UPV	AIIMS	4	13	1	DI across studies	RW	Delivering workshop in SO
25	ER	UPV	SFMSMU	4	27	1	DI across studies	RW	Delivering workshop in SO
65	ER	UPV	TU	7	20	2	Preparing data for dissemination	RW	Publication drafts
28	ER	ICEPS	TU	3	25	1	Innov solutions for FP	RW	Delivering workshop in SO
31	ER	ESENFC	SFMSMU	1	3	1	KT about falls prevention	RW	Delivering workshop in SO
31	ER	ESENFC	AIIMS	1	25	1	KT about falls prevention	RW	Contacting key stakeholders
64	ER	ESENFC	UAM	6	14	2	Preparing guidleines for DIS	RW	Publication drafts
31	ER	ESENFC	SFU	1	27	1	Creating knowledge base	RW	Technical report
31	ER	ESENFC	UMN	1	6	1	Creating knowledge base	RW	Contacting key stakeholders
34	ER	UB	PUC	7	21	1	Preparing data for DIS	RW	Project report to be shared
34	ER	UB	UMN	3	6	3	KT of falls prevention strategies	RW	Seminar open to Department
34	ER	UB	PUC	3	15	2	KT of falls prevention strategies	RW	Contacting key stakeholders
34	ER	UB	SFU	3	27	3	KT of falls prevention strategies	RW	Publication drafts
39	ER	SFU	MUG	3	5	1	Innovations for fall prevention	RW	Delivering workshop in SO
39	ER	SFU	MU	3	14	1	Innov for FP in rehabilitation	RW	Delivering workshop in SO
39	ER	SFU	AMEU	5	27	1	Ecosystem development	RW	Contacting key stakeholders
40	ER	SFU	AMEU	1	4	1	SGA discussions	RW	Contacting key stakeholders
40	ER	SFU	MUG	1	13	1	Knowledge base creation	RW	Delivering workshop in SO
40	ER	SFU	ESENFC	5	25	1	Ecosystem development	RW	Contacting key stakeholders
36	ER	TU	MU	3	9	1	KT of rehabilitiaion practices	RW	Delivering workshop in SO
36	ER	TU	MUG	3	5	1	Innov for Pn in rehabilitation	RW	Delivering workshop in SO
42	ER	UMN	MUG	3	9	1	Innov solutions for FP	RW	Technical report
42	ER	UMN	MU	3	15	1	Innov solutions for FP	RW	Workshop for RG at SO
42	ER	UMN	AMEU	3	26	1	SGA in the community	RW	Contacting key stakeholders
45	ER	SFMSMU	MUG	1	14	1	Knowledge base creation	RW	Delivering workshop in SO
45	ER	SFMSMU	UNIUD	2	25	1	Technology transfer	RW	Seminar open to Department
45	ER	SFMSMU	ESENFC	1	4	1	Creating knowledge base	RW	Contacting key stakeholders
45	ER	SFMSMU	ICEPS	1	13	1	Creating knowledge base	RW	Technical report
45	ER	SFMSMU	UNIUD	2	29	1	KT about molecular aspects of FR	RW	Publication drafts
45	ER	SFMSMU	MUG	1	9	1	Creating KB about falls	RW	Seminar open to Department
48	ER	WASU	ESENFC	5	10	2	Ecosystem development	RW	Contacting key stakeholders
48	ER	WASU	ESENFC	1	17	1	Creating KB about againg care	RW	Technical report
51	ER	AIIMS	ESENFC	1	2	1	Knowledge base creation	RW	Technical report
51	ER	AIIMS	MUG	3	25	1	Innov solutions for FP	RW	Delivering workshop in SO
52	ER	AIIMS	MUG	3	8	1	Innov for fall prevention	RW	Seminar open to Department
52	ER	AIIMS	MU	3	16	1	Innov for FP in rehabilitation	RW	Contacting key stakeholders
55	ER	PUC	ESENFC	1	3	1	Knowledge base creation	RW	Contacting key stakeholders
55	ER	PUC	UB	3	13	1	Innov for fall prevention	RW	Seminar open to Department
55	ER	PUC	MUG	3	26	1	Innov for fall prevention	RW	Technical report
58	ER	UAM	UPV	4	5	1	DI across studies	RW	Delivering workshop in SO

58	ER	UAM	ESENFC	4	13	1	DI across studies	RW	Seminar open to Departme
4	ESR	MUG	TU	3	5	9	Learning new innov app in FP	RW	Workshop for RG
5	ESR	MUG	UMN	3	14	9	Learning new innov app in data analysis	RW	Workshop for RG
11	ESR	AMEU	SFU	3	10	9	Learning new innov app in FP	RW	Workshop for RG
12	ESR	AMEU	WASU	1	4	4	Understandng diffrent practices in aging care	RW	Workshop for RG
12	ESR	AMEU	AIIMS	3	14	5	Understandng diffrent practices in FP	RW	Workshop for RG
15	ESR	MU	TU	3	6	9	Learning new innov app in FP and REH	RW	Workshop for RG
16	ESR	MU	UMN	3	7	9	Learning new innov app in FP and REH	RW	Workshop for RG
19	ESR	UNIUD	UAM	2	6	9	Learning new innov app in frailty DA	RW	Workshop for RG
20	ESR	UNIUD	UMN	3	12	9	Learning new innov app in falls/ EU	RW	Workshop for RG
23	ESR	HK	UMN	3	5	9	Learning new innov app in FP and REH	RW	Workshop for RG
26	ESR	UPV	UAM	4	11	9	Learning new innov app in frailty DA	RW	Workshop for RG
27	ESR	UPV	UAM	4	22	9	Learning new innov app in DA	RW	Workshop for RG
29	ESR	ICEPS	SFMSMU	3	6	9	Learning new innov app in FP	RW	Workshop for RG
30	ESR	ICEPS	SFMSMU	3	19	9	Learning new innov app in FP	RW	Workshop for RG
68	ESR	ESENFC	SFU	5	13	9	Learning about ECS creation and IMP	RW	Workshop for RG
35	ESR	UB	PUC	3	12	9	Learning new innov app in frailty care	RW	Workshop for RG
41	ESR	SFU	MUG	3	4	9	Learning new innov app in falls/ evascular ASS	RW	Workshop for RG
37	ESR	TU	MU	3	6	9	Learning new innov app in FP and REH	RW	Workshop for RG
38	ESR	TU	MUG	3	10	9	Learning new innov app in FP	RW	Workshop for RG
43	ESR	UMN	MU	3	9	9	Analysis of data about falls	RW	Workshop for RG
46	ESR	SFMSMU	UNIUD	2	8	9	KT about molecular aspects of frailty	RW	Workshop for RG
49	ESR	WASU	UNIUD	2	18	9	KT about molecular aspects of frailty	RW	Workshop for RG
50	ESR	WASU	AMEU	3	4	9	SGA in falls prevention	RW	Workshop for RG
54	ESR	AIIMS	UNIUD	2	3	9	LNA in molecular aspects of frailty	RW	Workshop for RG
57	ESR	PUC	UB	3	12	9	Learning new innov app in FP	RW	Workshop for RG
69	MNG	FUNKA	UMN	1	5	2	PM related plannng	RW	Project Report
69	MNG	FUNKA	UMN	6	9	2	Data dissemination strategies	MG	Project Report
69	MNG	FUNKA	UMN	6	17	2	PM related plannng	MG	Project Report
69	MNG	FUNKA	UMN	6	21	2	PM related plannng	MG	Project Report
69	MNG	FUNKA	UMN	6	29	2	PM related plannng	MG	Project Report
69	MNG	FUNKA	UMN	6	33	2	PM related plannng	MG	Project Report
70	MNG	FUNKA	SFU	6	8	2	PM related plannng	MG	Project Report
70	MNG	FUNKA	SFU	6	16	2	PM related plannng	MG	Project Report
79	MNG	FUNKA	SFU	3	28	2	PM related plannng	MG	Project Report
70	MNG	FUNKA	PUC	6	13	2	PM related plannng	MG	Project Report
70	MNG	FUNKA	PUC	6	25	2	PM related plannng	MG	Project Report
71	MNG	FUNKA	UAM	6	14	2	PM related plannng	MG	Project Report
71	MNG	FUNKA	UAM	6	26	2	PM related plannng	MG	Project Report
71	MNG	FUNKA	WASU	6	16	1	PM related plannng	MG	Project Report
71	MNG	FUNKA	TU	6	32	2	PM related plannng	MG	Project Report
71	MNG	FUNKA	WASU	6	17	1	PM related plannng	MG	Project Report
72	MGM	HTS	SFU	1	5	2	PM related plannng	RW	Project Report
72	MGM	HTS	SFU	5	21	2	Data dissemination strategies	MG	Project Report
72	MGM	HTS	SFU	6	33	2	PM related plannng	MG	Project Report
72	MGM	HTS	UAM	6	24	2	PM related plannng	MG	Project Report
73	MGM	HTS	WASU	1	4	1	PM related plannng	MG	Project Report
73	MGM	HTS	TU	6	14	2	PM related plannng	MG	Project Report
74	MGM	HTS	UMN	5	8	2	PM related plannng	MG	Project Report
74	MGM	HTS	UMN	6	16	2	PM related plannng	MG	Project Report
74	MGM	HTS	UMN	7	28	2	PM related plannng	MG	Project Report

2.3. Quality of the proposed interaction between the participating organisations

2.3.1 Contribution of each participating organization in the activities planned and expertise provided to reach the action's objectives

COMMUNITYCARE will bring together 9 European universities with leading expertise on ageing, ergonomics, long-term care system design and assistance technologies, and 8 Third country (TC) universities (located in countries with different levels of economic development and with increasingly high level of life expectancy and an increasing ageing population) with great expertise on the same topics in order to create a new generation of knowledge towards an understanding of falls and the creation of age-friendly environments and support systems, paradigms, models and methods for active and healthy ageing, preventing falls, and long-term care systems. In addition, two relevant **non-academic partners** focusing on dissemination activities**,** FUNKA and HTS, will **support an effective dissemination of the results to a large public and political bodies.**

COMMUNITYCARE will support **inter-and trans-disciplinary as well as intersectoral mobility. During the project, regular interactions with the two companies who are engaged in health care related disseminaton and are networked with all the keystakeholders in aging care, will take place.** This will support scientific knowledge and professional development at any stage of a researcher's career. In order to achieve the scientific objectives described in section 2.1, each partner of the COMMUNITYCARE project is essential. The efficient structure of the COMMUNITYCARE Academy ensures a balance in the number of universities between EU and TC. The non-academic beneficiaries (FUNKA and HTS) will ensure the project will be disseminated worldwide.

A key aspect of the COMMUNITYCARE Academy and network is that the participating institutions have expertise and skills that cover a wide range of scientific and technological sub-disciplines incorporating key areas extending beyond the field of fall prevention and rehabilitation **to innovatively address functional decline and frailty in the older population and to strengthen health and health competence over the last decades of** human life. The **multidisciplinarity** and **intersectoriality** of the Academy as well as the complementarity of its partners constitute the necessary foundation for reaching the overall goals of COMMUNITYCARE. This context creates an attractive variety of training experiences for all participants (especially young scientists appointed to the project) and for efficient knowledge sharing. The coordinating team at MUG has extensive experience in experimental research and training both in academic institutions and in health systems and their expertise will ensure a smooth flow of training and knowledge sharing activities among the different institutional partners. In addition to the European, national and institutional training activities, MUG carries out several educational programs related to falls prevention. MUG is inovled in several EU projects related to aging care coordinators in Action Group 2 (falls prevention) of the EIP on AHA. In addition, he is the national contact point of EUGMS on falls prevention in Austria. The coordinator's experience from several research projects will be used to ensure efficient interaction among partners, effective shared tutoring of different ESR and the ensuring of shared contributions to different project dimensions. Having collaborated closely with most of the partners involved in this proposal, the coordinator will be able to implement and reinforce the secondments that will strengthen the links among the project partners. In particular, the partners will provide the following complementary and essential expertise:

> **Medical University of Graz (MUG),** Austria: MUG runs internationally accredited PhD Programs which offer top-level training and research in topics such as metabolic and cardiovascular diseases, inflammation, cancer, stem cells, aging of the brain and neurodegeneration. In addition to a dedicated chair in geriatrics, the MUG is developing inter-professional geriatric education. It has several ongoing EU proposals related to aging and frailty as well national projects related to falls prevention and how interventions can prevent falls due to the effects of bedrest confinement. Expertise offered in this project: Bio-banking; basic research on biomarkers and physiology of aging and functional decline; informatics and statistics; clinical research in hospital setting on multimorbidity; expertise in clinical nutrition; expertise in educational programs; link to EIP/AHA; guideline development; development of educational programs for Gerontology and Geriatrics. Current collaborations with project partners: Projects on prevention on falls and smart and healthy living of the elderly in community together with Alma Mater Europea Maribor and in developing exercise activity programs for older persons with Kristiania University College (HK) and Masaryk University (MU). MUG role in project: Coordination and management (lead, WP7) and supporting all WPs.

> **Alma Mater Europea Maribor (AMEU ECM)**, Maribor, Slovenia: AMEU-ECM is specifically focused on interdisciplinary education and it runs the study program of Social Gerontology on all 3 Bologna levels. The education and research in Social Gerontology covers a wide spectrum of topics from healthy food and lifestyles, prevention of falls, economical and legal aspects of aging and medical anthropology. **Expertise offered:** anthropological aspects of aging and digitally assisted active and healthy aging, social factors of healthy lifestyles and prevention of falls; informatics and statistics; anthropological research in the community setting on prevention of falls and healthy lifestyle; expertise in educational programs; development of educational programs for digitally assisted AHA at department of Social Gerontology and Informatics. Current collaborations: AMEU runs the research project on prevention on falls and smart and healthy living of the elderly in community together with MUG. It is collaborating with Kristiania University College (HK) and ICEPS to prevent falls. AMEU role: Information processing (lead, WP4) and supporting WP1, WP3, WP5, and WP6.

Masaryk University (MU), Brno, Czech Republic: MU comprises 10 faculties and Research institutions. It is one of the oldest medical institutions in the Czech Republic. Expertise offered: Prevention and management of rehabilitation, especially in geriatrics. In addition, the group has leading networks and collaborations with several universities in Europe, the USA and Japan and with several of the project partners. MU role: Models and methods for fall prevention and rehabilitation (lead, WP3) and supporting WP4, WP5 and WP6

University of Udine (UNIUD), Udine, Italy: UNIUD recently established a multidisciplinary group on active ageing, involving more than 70 researchers from 8 different university departments. **Expertise offered:** Prevention and wellness; Translational research; Infrastructures and Technology; and welfare aspects in aging care. UNIUD role: Translational molecular and personalized medicine (WP2, lead) and supporting WP3 and WP5.

Kristiania University College (HK), Oslo, Norway: HK is comprised of School of Health Sciences which offers up to master degrees within various fields, including physiotherapy. Prof Per Morten is a physiotherapist, educator and an exercise physiologist. HK **role: Development of Ecosystems** creation (WP5, lead) and support WP6.

University of the Basque Country (UPV), San Sebastian, Spain. UPV is a leading research institution on computational intelligence neuroinformatics, natural computation, social interactions in the internet and computational behavior analysis. UPV role: Information processing (WP4) and supporting WP1 and WP7.

International Center for Professional Studies (ICEPS), Serbia. ICEPS offers study programs at all three Bologna levels in physiotherapy and nursing care. In the health sciences programs, special emphasis is placed on gerontology and geriatrics, Expertise offered: Best health practice, the application of innovation, and the prevention of falls in older people; research program on innovation and digital transformation in fall prevention and rehabilitation, clinical implementation of active and healthy aging programs and education**. Current collaborations**: ICEPS is cooperating with MUG and AMEU on developing innovative tools for falls prevention. ICEPS Role: Supporting WP1 and WP3.

Escola Superior de Enfermagem de Coimbra (ESENFC), Coimbra, Portugal. ESENFC is a school of Nursing with a research unit with many projects in diverse areas. Some of these include "Falls prevention in community settings" and "Prevention of fall in hospital settings". Current collaborations: ESDEDC is cooperating with MUG, via EIP-AHA A2 (falls action group) to develop innovative educational tools for fall prevention. ESENFC role in project: Building knowledge base for addressing aging and falls (WP1, lead) and supporting WP3 and WP6.

Université de Bourgogne (UB), France. The Cognition, Action and Sensorimotor Plasticity laboratory is a leader in motor control and rehabilitation. The lab is partly composed of academics and clinicians, including geriatricians. It has an active research interest in motor (re)learning and brings a strong engineering component in the field through innovative methods such as stochastic resonance and fractal analysis. UB role: Supporting WP3.

In addition, the 8 TC academic partners will provide the following complementary expertise:

Simon Fraser University (SFU), Canada: SFU has one of the highest publications impacts among Canadian Comprehensive Universities. Located on three campuses across the Greater Vancouver region SFU has research affiliations across two provincial healthcare regions with the largest population in British Columbia. SFU is therefore uniquely positioned for research into Aging and Frailty. SFU role: Supporting WP1, WP3 and WP5.

Tohoku University Graduate School of Medicine (TU), Japan: TU is a premier medical institution in Japan and has several ongoing projects related to rehabilitation, aging and frailty. **Expertise offered**: basic research on biomarkers and physiology of aging and functional decline; expertise in rehabilitation; expertise in educational programs; Gerontology and Geriatrics. **Current collaborations:** With MUG and MU. TU role: Supporting WP3.

University of Minnesota (UMN), USA. At UMN, the Halberg Chronobiology Center has a worldwide reputation for excellence in study design; data analysis, processing, and mining; as well as modeling in the context of assessing circadian (and other) rhythms. A suite of computer programs for the chronobiologic assessment of dynamic changes in physiological variables serves both research activities and educational endeavors. The Center has pioneered research aimed at understanding how circadian rhythms relate to cardiovascular health across all ages and how rhythm assessment from longitudinal physiological monitoring leads to early disease detection. Likewise, optimization of treatment administration schedules fosters significant reductions in the number of people who die of preventable heart attacks and strokes. Expertise in this project: Patterns of incidence of falls during the 24-hour day, 7-day week, and 12-month year can be examined in populations of different ages and in different settings, based on literature searches and actual data analysis. Longitudinal assessment of physiological variables and from questionnaires can also be related to the risk of falls in the elderly. Current collaborations: MU and TU. UMN role: WP3 and WP7.

I.M. Sechenov First Moscow State Medical University (SFMSMU), Russia. SFMSMU is the largest research medical university in Russia and is a member of EIP-AHA A2 (personalized health management and falls prevention). Expertise offered: Falls prevention and management of frailty. SFMSMU Role: Supporting WP1 and WP2.

Walter Sisulu University (WASU), South Africa. WASU is a university that is just starting its research in gerontology. Current collaborations: MUG and HK for developing assessment of falls in the communities and on educational aspects related to geriatrics. WASU role: Supporting WP1, WP2, WP3 and WP5.

All India Institute of Medical Sciences (AIIMS), New Delhi. AIIMS is a leading medical institution in India with equal emphasis on research, medical education and patient care., including Geriatric Medicine and upcoming Center for Ageing. It is actively involved in medical education about fall prevention directed to the elderly and caregivers. Expertise: Bio-banking, guideline development, development of educational programs for Gerontology and Geriatrics. Current collaborations: MUG, SFU, PUC. AIIMS Role: Supporting WP1, WP2, WP3 and WP7.

Universidad Catolica Argentina (PUC), Argentina: The School of Medicine at the PUC conducts research at its Institute of Biomedical Research (BIOMED), an Implementation Unit of the National Research Council (CONICET). The Chronophysiology Lab at BIOMED has long-standing experience in chronobiology research and is one of the strongest centers in biological rhythms in Latin America. Expertise: Central and autonomic rhythms in physiological and clinical settings in elderly population, such as neurodegenerative diseases like Alzheimer's and Parkinson's as well as premorbid stages like MCI and preclinical Alzheimer's. The research group has also studied the effects of melatonin in healthy elderly subjects and patients on the Alzheimer continuum and the circadian anomalies related to depression in aging. Collaborating with: MUG, MU, UB. PUC role: Supporting WP1, WP3 and WP7.

Anhembi Morumbi University (UAM), Brazil: UAM's campus of the biomedical engineering program is geographically located in the Technological Park of São José dos Campos, and it is integrated with the Health Technology Innovation Center of the Technological Park, coordinated by the Center for Innovation, Technology and Education (CITÉ). CITÉ is formed by a multidisciplinary group of scientists with R&D&I labs dedicated to the development of health-related technologie. Expertise offered: R&D of health technologies, such as new materials and prostheses, biomechanics, laser diagnosis and treatment, physical exercise community programs with socio-cultural transferable strategies. Collaborations: MUG, UNIUD, HK, ESDEC. UAM role: Supporting WP4 and WP5.

Public Health Strategy and its relationship with the academic setting

The 17 academic partners involved in COMMUNITYCARE are led by professors who have received several scientific awards and recognition both for research and teaching merits, especially in understanding the aging processes as well as in geriatric care in hospitals and communities. Additionally, the COMMUNITYCARE Academy will benefit from the participation in the project of FUNKA. FUNKA is a European non-academic organization that is a market leader in the field of accessibility and has a close relationship to end user organizations. FUNKA has expertise in the field of ICT for different initiatives (e-government, e-health, e-learning, and e-inclusion). FUNKA is coordinating the WE4AHA project (H2020) providing both coordination and support services to the EIP on AHA and also an e active partner in in DigitalHealthEurope CSA (H2020) as WP leaders in person-centered health and care & participation in SoCaTel project (H2020), ensuring that the co-creation platform for long-term care is accessible. It is a partner in RISEWISE (RISE) providing support to communication and dissemination activities. Therefore, FUNKA will present a unique and special platform for connection with the EIP on AHA community, with more than 900 AHA related organizations across Europe, including 102 European Regions as Reference Sites innovating in active and healthy ageing, and provide the expertise for dissemination of results of COMMUNITYCARE.

Communities and hospitals have not been directly included in the COMMUNITYCARE Academy but they will participate in the research activities planned in WP1, WP2 and WP3, will provide input related to information processing about falls and aging care (WP4), and will be active partners/key stakeholders in the development of the ecosystem (WP5). In addition, they will be involved in dissemination events (WP6), according to the following modalities: 1) By providing data, contributing fall prevention and rehabilitation metrics/project questionnaire use and falls risk assessment of older adults; 2) By testing tools, models and methods on specific real cases at the communities/hospitals in order to implement and validate the theoretical (WP1 and WP2) and instrumental (WP3) results achieved by the COMMUNITYCARE Academy; 3) By becoming members of the Stakeholder Panel (milestone M2) by contributing via annual board meetings, by providing advice and suggestions during the deliverable results presentations, and by participating in the main dissemination events; 4) By offering specific training events and visits, which will include real case demonstrations to the partners and, especially to all the ESRs involved in the project. The visits and demonstrations will be organized locally by each partner at the end of each annual meeting thus decreasing travel costs and/or during secondment periods. These community and hospital participants will be directly involved by the project partners on the basis of reliable and strong pre-existing connections/ collaborations in ongoing research projects. Some of these participants have already been contacted by the beneficiary partners and have confirmed a strong interest in this project, including geriatric centers, aging platforms and <u>companies involved in AAL</u>.

2.3.2 Justification of the main Academy and networking activities.

Main Academy and networking activities have been outlined in the table in section 2.2. The most relevant activities consist of a reliable and feasible plan of secondments both for ERs and for ESRs. An ESR during a secondment will have the opportunity to receive joint-supervision related to his/her work and his/her personal career development plan will be defined by him/her together with the main supervisor from the seconding institution and the hosting supervisor. The secondees will have the possibility to attend a list of different training activities both at their universities and at the hosting university. Each partner will exchange expertise with the secondee by participating in the WPs of the project, (at least one scientific WP and always participating in WPs 6 and 7). Know-how exchange will also be addressed formally by established methods such as attending lectures, seminars for master and doctoral students, meetings of research teams, laboratory testing activities. All the secondees will be introduced to all the permanent staff of the hosting organization and will be encouraged to participate in outreach activities and public events at the hosting country/institution. Finally, all these training possibilities offered by each partner will be summarized and publicized in a dedicated web page of the COMMUNITYCARE website.

3.   Impact

3.1   Enhancing the potential and future career prospects of the partner members (staff involved in project)

Ageing of society and decline in functional capacities of the EU population is seen as an important and growing challenge in Europe. COMMUNITYCARE will thus have a significant impact on the future of young researchers, expanding the frontiers of their knowledge in fields of outstanding relevance. This includes, for example, in designing long-term care systems in general and community care systems in particular, planning and managing of ageing communities, implementing new technologies for support of ageing residents, risk assessment and risk mitigation for ageing population at a high international level of health care and long-term care systems. The proposed multidisciplinary approach will offer researchers outstanding career prospects, not only in the research field, but also in the companies linked with the universities of the COMMUNITYCARE network, in AAL technologies application and in social studies research institutes. The research projects - thanks to a unique academy design with collaboration between European Universities and TCs universities - will also put researchers in the project in contact with a wide range of good clinical practices in aging care and provide them access to case studies and field studies. In addition, both ER and ESRs will gain knowledge about numerical simulation tools and have access to excellent laboratory infrastructure, and will be able to learn new experimental techniques during the secondments.

COMMUNITYCARE Academy will liaise with the human resources management of each participating partner, to ensure that strategies are developed for all the participating researchers, which fits into the stage of the career the researcher is in, and will help build up the career pathways and job opportunities of these researchers. When planning such strategies the time constraints of the mentors involved will be considered thus esnuring that the mentors have enough time to supervise and guide their mentees. At the kick-off this apect will be highlighted. COMMUNITYCARE offers an excellent opportunity to all the academic partners to involve doctoral students in a "Research and Innovation Staff Exchange" **experiencing different research environments** and **gaining new knowledge** focused on novel Translational and Personalized Medicine approaches to fall prevention and rehabilitation in community. This will **enhance their employability** not only in academia but especially in technology development companies, NGOs, national and regional governments and municipality administrations. In particular, the doctoral students exposed to an interdisciplinary research environment will learn new skills in addition to being culturally immersed in different environments in different countries which will enable them to gain international insight to community development and technology uptake for risk mitigation (falls) in the context of Active and Healthy Ageing. This approach will enable them to gain improved understanding of the benefits of international and cross-sectoral research, which will broaden their career perspectives, particularly outside academia (NGO, technology companies, regional and national governments and municipality administration). Researchers will gain **transferable skills** like adaptability, organization capabilities, leadership capacities and teamwork that will be useful to employers across various jobs, sectors and industries. These might include skills or other qualities employers seek in strong candidates. ESR will benefit from excellent career perspectives, through the COMMUNITYCARE research experience, both in academic and clinical setting. Expertise will be gained in several fields: biomarkers research, implementation of knowledge in development of screening technologies as well as use of AAL technologies and Ambient Intelligence supporting community fall prevention and rehabilitation programs as part of active and healthy ageing community development. The multi-site, highly effective and cross discipline doctoral training activities accessible by PhD students during COMMUNITYCARE secondments periods will be focused in creating scientific excellence in development of community level systems based on technological innovation such as using new biomarkers for Innovative Screening Technologies and Ambient Intelligence for risk mitigation. ESR will be able to claim profound knowledge on Active and Healthy Ageing in Community environments, from risk (fall) assessment and modelling, to the use of Ambient Assisted Living Technologies and Ambient Intelligence for risk mitigation, till key performance measurements of COMMUNITYCARE.

Involvement in COMMUNITYCARE project **will raise profile of doctoral students through networking, research outputs and communication activities to different target groups (including the media & general public)**. The COMMUNITYCARE International Network offers a good mixture of international scientific knowledge, public health and community development coupled to technical objectives, as the technological development is weighted equally with the research in WP2-5. Training is designed to equip the individual early stage researchers immediately with eminently marketable skill-sets, which should be attractive to a range of potential employers, ranging from health sector, technology and life sciences companies, national and regional governments, municipal authorities and academia. Specifically, trainees (ESR) by involvement in the development of active and healthy ageing community programs for fall prevention and rehabilitation using AAL Technologies and Ambient intelligence will acquire knowledge on

methodologies for development of policies, procedures, data processing and development of forecasting models for fall prevention and rehabilitation. Researchers after finishing the traineeship will be able to organize develop and promote integrated community care, fall prevention and age-friendly environment design, and lead community development understanding changing attitudes of ageing population to digital transformation of community in general and digital transformation of health and social care provision in the community in particular. Researches will be able to deal with questions about the ageing related risk in the EU, national, regional and community context and be able to answer to challenges of rising population of older adults with declining functional capacities in a realistic fashion and evaluate different public initiatives including social returns on investments (SROI) and social value creation. Such knowledge on development of digital technologies for integrated care in community with emphasis on fall prevention and rehabilitation will be addressed properly for the first time, and therefore develop capability of researchers with significant attraction to prospective employers in academia, government, health care, technology development and community development.

Regarding the health policy interest, one of the drivers of companies' participation in the project (companies will be involved in the COMMUNITYCARE stakeholder panel), for example, is the significance that the novel fall prevention management approaches will have in the field of the risk assessment for ageing population. In addition, this knowledge also has application across multiple sectors involved in the care of community dwelling older population in general, and population exposed to risk of falls in particular. Likewise, the strong interest of companies lies in the possibility of implementing the Ambient Assisted Living Technologies, so as to decrease risk of falls, so as to increase safety of community. The young researchers trained under COMMUNITYCARE Academy should enjoy the benefits of employability immediately upon graduation, as their policy making and technical capability will be an immediately marketable asset. In the longer-term, the trainees' career progression of both senior and junior researchers is expected to benefit from the deliberate combination of academic/community research experience, wherein the existing, close working relationship between the partners will create a dynamic working environment spanning all major economic developed areas: Europe, North America, South America India and Africa. This environment, together with the technical problem-solving approach of Ambient Assisted Living in Community setting that is part of each WP, should promote a creative working environment, which shall be further fostered by deliberate encouragement of interaction between the researchers to share experience and ideas. During secondments, the exposure to different research environments, activity sectors, technological applications, R&D strategies, and cultural approaches will further increase the potential of each participant to provides new skills, enhance their knowledge and future career perspectives, both in academy, technology development SMEs, insurance companies and public bodies.

The objectives of COMMUNITYCARE and EU policies about research careers and employability are intrinsically linked. The whole programme is in line with EU needs, priorities and long-term goals.

The important impact of COMMUNITYCARE will be
- Development of joint training programmes to better address future needs of technology development corporations, social enterprise, community development NGOs, regional and national governments and municipality administration.
- Preparing early stage researchers for a career in academia or non-academic sectors. Special skills gained in this project will boost development of entrepreneurial skills and of AAL technology start-ups. ESRs will be able to source for the required funding for their start-ups and social enterprises (funding for innovations, AAL technology development, data processing, community development).
- Providing supervision and quality assurance, in particular in case of training programmes for early stage researchers.
- Increasing inter sector mobility possibilities for both ER and ESRs.

3.2   Developing new and lasting research collaborations, achieving transfer of knowledge between participating organisations and contribution to improving research and innovation potential at the European and global levels

COMMUNITYCARE will develop an "International Academy" because 17 partners from 6 different economically developed regions are involved: Europe, North-America, South-America, Russia, Far-east (Japan), Africa. The COMMUNITYCARE will **create a science and technology network** at a global level where relevant actors from academic, research and community development sectors will **utilize networking tools and activities to address the risk mitigation - ageing population challenges facing the worldwide long-term care sector,** helping to reduce events

leading to ill health and disability supported by RDI –AAL technologies/ long-term care efforts, ensure solutions are developed with a broader set of expertise, and also help refine the efforts of diverse researchers.

The secondments within the scope of the project will substantially benefit the hosting organizations and the seconded staff. This is guaranteed by: 1) The structure of the partners which comprises a set of complementary expertise required for the research tasks and WP pages as described in 2.2.1; 2) The community development sector will play an incredibly important role and it will be largely involved thanks to the stakeholder panel since month 3. All partners beneficiaries are in contact with relevant communities, intended to join the stakeholder panels and give a strong support to the COMMUNITYCARE Academy; and 3) While this is the first time that all the partners will work together, the collaboration between individual partners via previous participations in research projects, conference scientific committee, research association, editorials, PhD programs and Erasmus+ programs have been ongoing. These experiences provide further confidence that the partnership is strong and capable of running a large-scale funded project, and is especially established in knowledge transfer and capacity building. However, **there is a need for long-term strategic and inter-sectoral co-operations for developing effective and appropriate solutions for future Active and Healthy ageing workforce.**

3.2.1 Development of perennial research collaborations of COMMUNITYCARE partners

During the COMMUNITYCARE project duration, especially in the last year, the coordinator together with FUNKA will explore different opportunities for lasting research collaboration based on new EU, national and regional research and innovation funding project participation of selected partners. Different calls of Horizon Europe and Digital Europe, as well as other suitable funding instruments (such as Erasmus+, COST Actions, Interreg, etc.) will be explored and tested to leverage the knowledge initially generated within in COMMUNITYCARE. The idea is to develop a 10-year duration plan for long-lasting research collaboration among the COMMUNITYCARE partners based on the leverage and direct exploitation of the new knowledge and ideas generated during the first 24 months of the project. A dedicated plan will be produced in the context of WP6.

3.2.2 Knowledge transfer that will benefit the participating organizations in the long term

A key advantage of the COMMUNITYCARE partnership is that the participating institutions combine academic excellence with leadership in research, and also have expertise and skills that cover a wide range of scientific and technological sub-disciplines including, and extending beyond, the field of medicine. The **multidisciplinarity** and **intersectoriality** of the partners are important aspects for reaching the overall scientific goal of COMMUNITYCARE and will create a win-win situation for all as well generate spill-over effects at a Global and European level. The results of the project will significantly improve mitigation of risk of falls of older adults in community by developing technological innovations in age-friendly environments. Finally, there is a valuable complementarity in the scientific and research competences in the project, which creates an attractive variety of research experiences available to the ESRs. For the details on the partners' expertise and capacities, see Part B2.

3.2.3. Contribution of the action towards research and innovation potential within EU and/or worldwide

The COMMUNITYCARE **research programme and the Staff's activities** (including dissemination/ exploitation/ communication/ outreach activities) **will contribute to Europe's economy and society in the following way**:

a) Support to the achievement of EU research/policy goals such as the new *Horizon Europe and Digital Europe* funding programmes or Industrial Leadership Pillar, Research Roadmaps and EU policies on Active and Healthy Ageing, Age-friendly environments, health, digital economy in general and digital transformation of health and long-term care in particular

b) Support the sustainable development of a new European Standard in the field of fall prevention (e.g. developing a new EU Curriculum, such as this one https://www.dropbox.com/s/11cpsligwepc15l/CWA%2016266-2011%20Curriculum%20Universal%20Design.pdf?dl=0i**)** and rehabilitation and AAL technologies.

c) Achieving Sustainable Development of EU, including in economic and social dimensions. Economic sustainability of EU will be enhanced by providing economic added value through contribution to development of new AAL and Ambient Intelligence technologies, products, services, governance and business models that improve competitiveness of EU technology companies and prosperity, and promoting job creation or safeguarding jobs, together with related policies. Social sustainability of EU will be contributed by addressing and improving human health, quality of life, safety and security of individuals and populations, culture, skill formation, social integration and inclusion, poverty reduction, effective and democratic governance, and related policies.

d) Contribute to strengthen the Union's excellence and attractiveness in research and innovation as well as its economic and industrial competitiveness by creating win-win situations and cooperating on the basis of mutual benefit; by

attracting talent and investment to the Union; by facilitating access to new and emerging markets; and by agreeing on common practices for conducting research and exploiting the results;

e) Tackling global societal challenges by developing and deploying effective solutions more rapidly and by optimising the use of research infrastructures.

f) Support business - academia collaborations through the creation of "Knowledge Alliances" between education and business to develop new curricula addressing innovation skills gaps. They will help universities to modernise towards interdisciplinarity, entrepreneurship and stronger business partnerships.

g) Ensure simpler access and stronger involvement of SMEs in development of AAL Technologies.

h) Facilitate collaborative research and knowledge transfer within the project's research program and beyond.

i) Contribute to scientific cooperation with TCs as an issue of common concern and develop joint approaches. This will lead to global approaches and solutions to societal challenges and to the establishment of a level playing field.

j) Contribute towards some of UN's Sustainable Development Goals (SDGs). For instance, the project maximally addresses SDG3 (good health and wellbeing) and also touches on other SDGs, including SDG 4 (quality education), 5 (gender equality), 8 (decent work and economic growth), 10 (reduced inequalities), 11 (sustainable cities and communities), 16 (peace, justice and strong institutions) and 17 (partnership for the goals).

3.3. Quality of the proposed measures to exploit and disseminate the action results

3.3.1 Dissemination strategy of the results

Research outcomes of the project will be made publicly available via project website, social media, magazines, popular press & broadcasting. Efforts to raise awareness among targeted users, scientific communities, local authorities, healthcare providers, industry representatives and civil society organizations supporting older adults in the EU and Third Countries involved will be also intensified. All researchers will ensure, in compliance with their contractual arrangements, that the results of their research are disseminated and exploited, e. g. communicated, transferred into other research settings or, if appropriate, commercialized. Experienced researchers, in particular, are expected to take a lead in ensuring that research is fruitful and that results are either exploited commercially and/or made accessible to the public, whenever the opportunity arises. It is planned that, each WP dedicated to research, should have minimum of 2-3 publications emerging from that WP. The main dissemination strategies will be via:

Online dissemination, including project website and social media: A COMMUNITYCARE fully accessible and usable website will be created by FUNKA and it will be maintained updated by a specific team defined in the communication and dissemination plan. The website will facilitate communication, and discourse between the COMMUNITYCARE project team and with the external community of targeted users, such as the stakeholder panel, local community and community developers, policy officers, health care organisations, industry players (big health and care industry, SMEs, entrepreneurs and start-ups) , non-specialists, subject matter experts, and future implementers of COMMUNITYCARE outcomes. An additional objective of the website is to create a community of interested parties around the project, to accelerate the research results and create momentum beyond the project.

Interactive dissemination: Our joint PhD education projects in between MUG and WASU, and MUG and SFU as well as AMEU and UMN and UNID and AIIMS. Research results will be disseminated via top-tier academic journals, including open access ones, such as Gerontology, Aging, Clinical Interventions in Aging Care, Frontiers in Public Health, International Journal of Production Research), top-tier academic conferences such as the Annual World Congress on Anti-Aging and Regenerative Medicine, International Conference on Frailty and Sarcopenia Research, Intra- and Intercellular Mechanisms of Aging, Euro Conference on Aging, Gerontology and Associated Diseases, International Federation Automation Control, IEEE). In addition, regional conferences in this field such as the Annual Aging Network Steiermark, in which Prof. Goswami is the co-president and organizer, will be attended, where possible, by the partners of COMMUNITYCARE thus allowing them interactions with regional stakeholders in aging and allowing them to see scaling up of good practices as are being done in a EU aging care reference site. Additionally, research seminars at relevant EU institutions will also be organized by partners. Reports will be distributed to key government agencies regionally and in each partner country. Project partners will also publish publications related to community care of older persons. Where possible, good practices in aging care will be distributed in each partner country in the local language. Efficient exploitation of good aging care practices via outreach activities will go a long way in ensuring effective dissemination of the good practices related to aging care, particularly across the globe.

Participation to international conferences: 1) To promote COMMUNITYCARE results dissemination through conference papers, presentations and special sessions. The researchers will be encouraged in submitting research results to international conference and seminar to involve the scientific community and where the project partners are involved as the members of Scientific Committee and editors of proceedings. This will give an excellent and broadly visible chance for COMMUNITYCARE results dissemination. 2) The majority of the senior researchers involved in COMMUNITYCARE are members of the organizing committee of future relevant conference (for example EIP AHA annual meeting, Aging conference) or are involved in the scientific and organizing committee (e.g. EUGMS, EMA) or have already chaired special invited sessions (IFAC). 3) Publication on both scientific journals and practitioners' journal, while also in newspapers (emphasizing joint publications and open-access). Moreover, it is planned to publish special issues dedicated to COMMUNITYCARE project; all partners are conversant with dissemination. 4) Participation of external scientists to COMMUNITYCARE scientific meetings: To promote integration of research results and existing research project and to divulgate useful information. 5) Dissemination through the experts of the External Advisory Board and the stakeholder panel. 6. Dissemination through Scientific International Associations in Europe, as first of all EIP on AHA, and others to which the participants belong to. 7) Dissemination through public bodies and other institutions (e.g. Ministry of Health, Chambers of commerce). 8) Dissemination through the EIP on AHA platform. FUNKA as partner organization of the COMMUNITYCARE project will present a unique platform for dissemination of results of the project COMMUNITYCARE. The project will be able to benefit of this important platform to provide leaders with a space to proactively focus on the future also regarding challenges of ageing population and therefore ageing workforce. HTS will also disseminate COMMUNITYCARE results to regional partners in Austria and the Alps Adriatic region. 9) A final international workshop including multiple audiences beyond the action's own community will be prepared on month 36 and will include social partners and policymakers.

3.3.2 Use and take up of results

The exploitation approach of the COMMUNITYCARE project will be accompanied by certain supportive activities. For example, preparing the results and intellectual property (IP) (e.g. materials, publications and patents) entailed and the relevant ownership and access right of the researcher and the Host (including partner organisations); identifying and protecting results (including the allocation of a staff member to be an IP right manager); tracking of confidentiality issues (e.g. through confidentiality agreement, MoU, tracking open sources software licenses, etc.); continuously analysing of transfer opportunities as well as helping of the user community adjusting the project when necessary in order to ensure the best possible outcome. The partnership agreement based on the directive of the contract with the EU commission will define in detail rights and obligations with respect to IPR. The arrangements will be discussed, agreed and signed at the outset of the project (WP7).

3.3.3 Expected impact of the proposed measures (e.g. addressing societal needs/challenges).

To achieve change management towards an integrated care approach for older persons, an inter-professional and multi-disciplinary approach - as proposed in this project - is required. The targeted knowledge, efficient design and coordination of health care strategies and the effective dissemination and implementation of new solutions and tools for frailty and falls in older persons are required to meet the challenges associated with an increasing older population. The COMMUNITYCARE partners from Europe, North America and Japan will share good practices in aging care with those from developing countries to ensure that emerging countries can cope better with this global aging trend.

3.3.4 Intellectual property rights aspects and exploitation of results.

The IPR of results to be generated in this project will be owned by the organisation(s) of the investigators(s) who made the relevant discoveries. However, no new IPRs are expected in the project.

3.4 Quality of the proposed measures to communicate the action activities to different target audiences

3.4.1 Communication strategy of the project and its results, outreach plan and the activities envisaged

Activities need to engage general public will take place across the regions represented by partners of the project. Special emphasis will be on dissemination of results to older adults and user association that are represented by AGE-PLATFORM EUROPE, AARP in USA, CARP in Canada, Indian Association of Retired Persons. The outreach activities will be, where possible in local languages, and in as simple language as possible thus ensuring that such activities and the importance of aspects such as physical activity, nutrition, cognitive training are easily understood by the public. By interacting with the public, researchers will be able to understand the needs of aging communities and address specific research areas such as gender, cultural background, fears associated with falls and confinement to nursing homes, when designing more research projects.

3.4.2 How the activities will be targeted at multiple audiences, beyond the action's own community

The COMMUNITYCARE outreach plan will encompass activities targeting the following audiences: (a) general public including relatives and aging persons will informed and educated on healthy ageing (including the "buddy" system of care), (b) caregivers will be informed of techonological advances, best practices, and treatment developments, (c) companies will be contacted as stakeholders for the communication of needs and the call for technological solutions, (d) government agencies will be updated on progress to be informed for political decisions, (e) academical peers will be the target for specialized dissemination through journals and conferences.

3.4.3 Channels that will be used to inform and reach out to society, and to show the benefits of research

Right from the start, project related information will be disseminated to 4 communities: academic, technology development SMEs, insurance companies and governmental bodies and organizations. This will be done via the public area of the project's website. Specifically, the website will facilitate knowledge and the research program progress sharing with the public community and for reporting current activities. Active public participation will be achieved via public workshops (e.g. MUG's annual research symposium on aging, Laboratory open days, AAL Forum, eHealth week, IFIC annual conference, EHTEL symposium, Marie Curie project open days), discussion evening (e.g. European researchers' night events) and public events (EIP AHA Annual Meeting, organized by FUNKA in collaboration with the European Commission; HTS organized annual Active and Healthy Aging week in different regions of Austria). The expected impact of the proposed activities of COMMUNITYCARE Academy will be to develop forum for open public debate regarding technological solutions for mitigating risk of falls and rehabilitation in the community. Additionally, the contributions to safer and healthier communities for older adults, leverage of accumulated experiences, increased wellbeing of older adults residing in the community, and better public understanding of social value created by community fall prevention and rehabilitation programs and improving sustainability of public health care and long-term care systems and new opportunities for technology development SMEs will be discussed.

In accordance with the European Charter for Researchers, the project partners will be actively involved in communication and public engagement, and will address the following issues: 1) Communicating science and addressing concerns, in order to enhance public trust in science. This is key for giving the fellows the perception of the public opinions and priorities in confronting with science and scientists. 2)Showing how European and international collaboration can achieve more than would have otherwise been possible, notably in reaching scientific excellence, contributing to innovation, competitiveness, entrepreneurship and solving societal challenges. 3) Showing how the outcomes are practically impacting on our everyday lives, by creating new and preserving existing jobs, training skilled researchers, introducing novel technologies, and making lives of ageing population more comfortable and secure. 4) Making better use of the results, by promoting their take up by decision-makers to influence policy-making, and by technology development SMEs, insurance companies and the scientific community. The **planned strategy for public engagement** includes a series of outreach activities that can be grouped in three different categories: the first two categories (a, b) are activities that will be "physically" performed by the fellows at the partners' premises. We believe that, in order to be effective, these activities should be performed locally thus spreading the project outputs in the local context where the COMMUNITYCARE partners are located. This will also imply also **dissemination in languages of communities** where events will be organized. The third category (c) is a set of activities that can be performed virtually by the fellows in the project. FUNKA and HTS will also help COMMUNITYCARE Academy with public engagement activities. **Local community-related Outreach Activities and Academically-related Outreach Activities** will be carried out and planned at the beginning of WP6 by developing the dissemination plan. This plan will consider also that academic partners will be regularly involved in outreach activities in their region. Each COMMUNITYCARE partner will be required to take active part in at least one of those activities during his/her stay at the partner's place. Specifically, partners will be encouraged to propose and implement dissemination actions by organizing short presentations and demonstrations for the visiting citizens through posters. Partners will also be encouraged to propose demonstrations during the University Orientation Week, which draws students of varios disciplines (e.g. ergonomics, aging studies and management). During the Orientation Week, fellows will also be asked to prepare a stand as Marie Skłodovska Curie Ambassadors, to illustrate the Marie Skłodovska Curie actions to the students and their families. Many partner institutions organize every year a cycle of dissemination conferences targeted at the city's public audience, in which fellows will be encouraged to take an active role e.g. by proposing a Marie Skłodovska Curie-dedicated event. Fellows will get in contact with local associations dedicated to the dissemination of scientific and technological culture and encouraged to participate in the design of events such as exhibitions, scientific cafés, school visits or guided visits for children and families to research laboratories. The majority of the outreaching activities will be concentrated at a local level, because of the greater impact that can be obtained from continuity of engagement. Additionally, **Virtual Outreach Activities**

Right during and after secondments will also be carried out. Partners will be involved in the update of the COMMUNITYCARE project website. Partners will follow a plan for managing the website periodic updates, by gathering and select data generated across the program, and presenting them in the project website in a non-confidential and understandable fashion. Another virtual tool will be the twitter account of the project and the quarterly electronic newsletter that will communicate project results. Via the COMMUNITYCARE Academy partners such as FUNKA and HTS, we plan to reach more than 20.000 target users.

4. Quality and efficiency of the implementation

4.1 Coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources

At the very start of the project, human resources management strategy will be laid out to all the partners. Additionaly, to achieve the aims of COMMUNITYCARE, and to ensure easier management of the activities carried out during the project, following WPs have been chosen: 5 WPs (developed in parallel) dedicated to the main research areas, 1 WP dedicated to dissemination and educational aspects and a WP dedicated to project management.

4.1.1. *Consistency and adequacy of the work plan*

The Work plan proposed in the WPs ensures that key knowledge and research competencies will be built in the area of frailty, falls, new approaches in reduction of falls, creation of the ecosystem, development of guidelines and educational programs (Figure 1). Bio-psychosocial aspects will be included. These are detailed under each WP.

4.1.2. *Credibility and feasibility of the action*

The work plan is feasible as several of the partner are already collaborating with each other. In addition to building new networks, it will be ensured that each action and the proposed tasks are adequately covered, especially by the sending and hosting institutions. The WP leader will ensure that appropriate and timely actions are taken to ensure that the project actions are on time and immediately take corrective measures when this is not happening.

4.1.3. *Credibility and feasibility of the allocation of secondments*

It will be ensured that strict secondment timelines are met, especially by the sending and hosting institutions. The hosting and sending ERs will ensure that during their secondments that all their tasks as well as the timing of the secondments are done on time. This must be established at the kick off meeting by all the persons involved in the project. The ESR secondments will be planned well in advance to ensure that the secondments bring maximum benefit to the visiting ESR. The ESR secondments will be planned carefully by the sending main supervisor and the host co-supervisor.

Table B2: Work Package Description

Work Package Number: 1											Start/end Month 1/36
Work Package Title: Building knowledge base for addressing aging and associated functionality and mobility issues leading to falls in a bio-psycho-social context											
Lead Beneficiary: ESENFC											

beneficiary	ESENFC	MUG	AMEU	UPV	FUNKA	HTS	SFU	SFMSMU	WASU	AIIMS	PUC	
PM	4	1	5	1	2	2	2	4	1	1	1	

Objectives: To build a knowledge base on community care, frailty development, fall prevention and rehabilitation. Several dimensions, including assessment of functional capacities from a life-course perspective, will be incorporated here.
The WP1 will encompass 5 scientific tasks that will be developed in parallel during the project and will be implemented via the Task leaders.
Task 1.1. State of the art (month 1-36): Exploring medical and psycho-social aspects of frailty and falls. Lead partner ESENFC; participants: AMEU, ICEPS. Here advancement of the knowledge related to efficient design and coordination of health care strategies and the effective dissemination and implementation of new solutions, tools and technologies for promoting healthy aging will be carried out. ERs will be seconded from ESENFC to SFMSMU to obtain current practices in Russia in this regard while 1 ER from AMEU and ICEPS will be seconded to UMN to discuss such programs in the US. The task involves collecting evidence of good practices and integrated approaches in aging care to achieve the deliverables of creating a knowledge base of good practices. During this task, specifically by learning about new innovations and approaches in aging care, in the context of the biopsychosocial model, the secondee will be able to network and improve their research approaches and career options.

Task 1.2. Exploration of Models and methods for efficient fall prevention and rehabilitation system (month 1-36). Lead partner: AMEU, participants: UPV, PUC. 1 ER from AMEU will be seconded to PUC while another ER will be seconded to TU to share knowledge with the partners about social perspectives of aging care. In addition, the ER from PUC will visit PUC to discuss the current large data available in Argentina (obtained from MR related to Alzheimer's and Parkinson's Diseases) and how this big data could be used for modelling purposes/ information processing. ER from PUC will visit the ESENFC to build the knowledge base related to aging care, especially in aspects related to chronobiology. The task involves collecting evidence of models and methods for efficient fall prevention and rehabilitation, including aspects related to uptake of digital technologies for community care in societies and changing culture of risk mitigation in context of Active and Healthy Ageing. The knowledge gathered would be integrated into the deliverables obtained from Task 1.1. to create a knowledge base of good practices. In this task, specifically by learning about new innovations and approaches in aging care, in the context of the social gerontology, including cultural dimensions, the secondee will network and improve their research approaches.

Task 1.3. Fall prevention programs (month 1-36) Lead partner MUG, participants: SFMSMU, SFU. Aspects such as fall prevention using innovative methods such as resistive vibration exercise will be discussed with the Canadian partner (SFU) during the visit of the ER from MUG. There is a long-standing collaboration of the MUG with SFU in assessment of cardio-postural interactions. During this secondment, data analysis of old data and new projects related to understanding the mechanisms of falls will be planned. ER from SFU will also visit MUG to discuss further aspects related to aging care and prevention of falls post-hospitalization (that is, to understand how bedrest confinement during hospitalization affects risk fo falls). Similarly, an ER will travel from SFMSMU to MUG to discuss innovative approaches in falls prevention and how current practices in both regions could be best adopted for use by partners in the consortium. Both MUG and SFMSMU are collaborating in falls prevention action group (A2) of the EIP AHA and have been involved in establishing synergies in aging care between the two regions. An important deliverable here would be fall prevention strategies, together with partners from the consortium, and along with the EIP AHA collaborators. This deliverable is important nut just to boost the networking and research capacities of the secondee but also the host institute personnel. Another deliverable would be the presentation of a report which will discuss several approaches of falls care and how falls can be avoided. Reducing falls and falls-related injuries will be go a long way in reducing patient care costs and quality of life but also improving activities of daily life.

Task 1.4. Active and healthy ageing models across the globe (month 1-36). Lead partner: ESENFC, Participants: SFU, WASU, AIIMS, PUCHere several ERs will move between different partner institutions to discuss and exchange current and planned healthy ageing models. For instance, ER from ESENFC will travel to UMN to learn about these practices in the US while partners from TC countries will visit EU partners to discuss good practices related to tackling frailty, preventing falls and screening methodologies in hospitals.

Task 1.5. Long-term care (month 1-36) Lead partner AMEU, participants: ICEPS, AIIMSAn important dimension of aging care will be investigated during the secondments: long-term care. This task will be led by physiotherapists and social gerontologists from AMEU and ICEPS. Both of these partners have been colllaborating for years on aspects related to geriatric education, social gerontology, physiotherapy and nursing care. Aspects such as health promotion, patient empowerment, medical anthropology in long term care in long term care will be discussed during their secondment (I ER from AMEU going to TU in Japan and 2 ERs secondments to SFMSMU).

Description of Deliverables: WP1 has 3 scientific deliverables detailed in the Table B3a and provided at month 18 (2 scientific reports) and at month 36 (two final scientific reports). The reports provided by all the lead partners and parcipating organizations will be used to prepare publications, policy statements as well as guidelines that will be shared with all the key stakeholders, including AAL partners.

Work Package Number: 3											Start/end Month 1/36			

| Work Package Title: **Models and methods for efficient fall prevention and rehabilitation in integrated care systems.** |

| Lead Beneficiary: MU |

beneficiary	MU	MUG	AMEU	UNIUD	HK	ICEPS	ESENFC	UB	TU	SFU	UMN	WASU	AIIMS	PUC
PM	23	17	10	12	18	16	18	12	23	11	12	7	13	16

Objectives: critically evaluate validated and operational schemes for early diagnosis - and prevention of - frailty, by testing if some of these new technologies may enter the market faster, by connecting research to innovation and strengthening procurement processes.

The WP2 will encompass 3 main scientific tasks that will be developed in parallel by the same partners during the 4-year duration of the project. Task leaders will coordinate the activities.

Task 2.1. Early Diagnosis of Frailty and sarcopenia (to personalize physical and nutritional interventions (month 1-36) Lead partner UniUD; participants: MUG, SFMSMU, WASU, AIIMS. The researchers will study the tools available for early diagnosis of frailty related to sarcopenia, including biomarkers of oxidative stress, cell senescence and inflammation, epigenetic markers, salivary biomarkers or engineered molecular probes for imaging techniques. Preclinical frailty can also be evaluated in terms of functions, and in this respect non-invasive evaluation tools of muscle function and metabolism, such as salivary biomarkers or engineered molecular probes for imaging techniques or selective detection of biomarkers, should be identified and validated, to be ideally utilized in the general elderly population. In terms of oxidative metabolism, these tools can span from the systemic level to the skeletal muscle and can be associated with more invasive measurements, to be performed in selected aged populations or in animal models. We will investigate the state of the art related to factors that contribute to frailty and the need to personalize aging care that characterize the emerging disability in SARS-2 survivors and the adverse effects of lockdown or quarantine on the health of chronically disabled people, also using or detecting specific clinical and biochemical risk markers.

Task 2.2. Advanced Therapies Challenge, including senolytics and cell-based therapies (month 1-36). Lead partner UniUD, participants: AIIMS

Task 2.3. Immunological response challenge as aging is associated with decline in immune function (month 1-36)

Lead partner: UniUD, participants: AIIMS

Description of Deliverables: WP3 has 2 scientific deliverables detailed in the Table B3a and provided at month 18 (cientific reports) and at month 36 (scientific reports).

Work Package Number: 4				Start/end Month 1/36

Work Package Title: Information processing

Lead Beneficiary: AMEU

beneficiary	AMEU	MUG	UPV	UAM
PM	8	3	20	11

Objectives: Design of dataset, data collection methods, data analysis & interpretation.

Task 4.1. Dataset design (month 1-36). Lead partner: AMEU; participants: MUG, UPV, UAM. Falls, especially in elderly persons, are an important health problem worldwide. Reliable fall detection systems can mitigate negative consequences of falls. Among the challenges reported in literature is the difficulty of fair comparison between fall detection systems and machine learning techniques for detection. In this WP, we will develop a common Fall Detection Dataset. The visiting ESRs will learn about techniques of machine learning, specifically for big data about falls. Similarly, the ERs from Europe who will travel to TC countries will carry out knowledge transfer about innovative methodologies in data anaylsis (e.g. falls and falls-related injury data from hospitals/communities across the seasons, tilt table testing data).

Task 4.2. Development of data collection methods (month 1-36) Lead partner UPV, participants: MUG, AMEU, UAM. An accurate measurement system and data collection system is an important component of the quality improvement process that allows staff to determine if changes in care lead to improvement. The key indicators for the fall management are outcome measures that include falls, residents who fall, residents with two or more falls and fall related serious injuries. In this WP we will develop common methods for data collection on falls.

Task 4.3. Development of data analysis and interpretation methods methods (month 1-36) Lead partner: AMEU, participants: MUG, UPV, UAM. In this task, we will develop methods to integrate, unify and standardize data to enable insights and analytics for falls across the different setting including, home, community and hospital.

Description of Deliverables: W4 has 4 scientific deliverables detailed in the Table B3a and provided at month 18 (2 scientific reports) and at month 36 (two final scientific reports).

Work Package Number: 5								Start/end Month 1/36

Work Package Title: Development of Ecosystem for Active Ageing

Lead Beneficiary: HK

beneficiary	HK	MUG	AMEU	MU	ESENFC	HTS	SFU	WASU
PM	2	3	1	1	9	4	2	2

Objectives: Establish an enabling health care Ecosystem. Within this Ecosystem all currently involved professional stakeholders will be efficiently linked. This health care Ecosystem will facilitate communication and feedback for an integrated care approach at all levels. It will be set up on a long-term basis for developing and transferring new knowledge, new solutions and guidelines among all stakeholders in order to maximize independency and active behaviour in older persons and minimize health care costs. Ecosystem at the local/national level will allow the project's partners to develop a model and scale it up in other countries. The ecosystem will continue at the end of the project via the COMMUNITCARE Academy, which wil allow the partners to network and collaborate with each other and beyon the project.

Task 5.1. Create the Ecosystem with relevant stakeholders (month 1-36) Lead partner HK; participants: MUG, AMEU, MU, ESENFC, HTS, SFU, WASU. This tasks involved interactions with all the project partners and key stakeholders thus encouraging interdisciplinarity and understanding of the frailty and falls perspectives, taking into account the bio-psycho-scoial model. The ERs and the ERs involved here will exhcnage ideas and good practices so that a proper scaling up model of aging care can be created and implemented in Task 5.2.

Task 5.2. Build the Enabling environment (month 12-36) Lead partner HK; participants: MUG, AMEU, MU, ESENFC, HTS, SFU, WASU.

The Ecosystem, by gathering all these stakeholders, in an "enabling environment" will allow demployment - and scaling up - of more efficiently innovative interventions and solutions.

Task 5.3. Disseminate through the COMMUNITYCARE Academy's International Network of partners the innovative approaches and new methodologies in geriatric care (month 12-36). Lead partner:HTS , participants: HK, MUG, AMEU, MU, ESENFC, SFU, WASU.

Task 5.4. Develop areas of future research based on the evidence obtained in this project (month 12-36) . Lead partner: MUG; participants: MUG, AMEU, MU, ESENFC, HTS, SFU, WASU. This task will ensure that the ecosystem will thrive via the COMMUNITYCARE Academy even when the project is completed.

Description of Deliverables: D5.1: Map of all Ecosystem's stakeholders and their commitments, D5.2: Strategy and action plan validated by all Ecosystem stakeholders, D5.3: Digital Platform for Data and information sharing "Connector", D5.4: Materials and content for training and advocacy programmes, D5.5: Evaluation methodology plan and design, D5.6: Repository of Funding/business model for innovative interventions, D5.7: Dissemination material and events with other Ecosystems in Europe

Work Package Number: 6								Start/end Month 1/36

Work Package Title: Knowledge management and Dissemination

Lead Beneficiary: FUNKA

beneficiary	FUNKA	MUG	AMEU	MU	UNIUD	HK	ESENFC	HTS
PM	26	1	1	1	1	2	2	8

Objectives: This activity is led by FUNKA and supported strongly by HTS and each WP leader. To create awareness amongst all levels and types of stakeholders of the importance of the creation of age-friendly environments and support systems, paradigms, models and methods for active ageing and long-term care systems. Also carried out here will be dissemination of the results beyond the project beneficiaries using tailored channels and tools, enabling and fostering their usage and exploitation by the identified target groups. Finally, sustainability beyond project duration and leveraging of the knowledge generated in the early stages of the project and planning for a long-lasting research collaboration beyond the project duration will be ensured by engaging relevant stakeholders in the project during all stages of the project. It is foreseen that both FUNKA and HTS will be working closely with the partners to ensure that this important objective is achieved.

Task 6.1. Communication and dissemination plan (M1-M36). Lead partner FUNKA; participants: MUG, AMEU, MU, UNIUD, HK, ESENFC, HTS. The COMMUNITYCARE communication and dissemination strategy is to be intended as a living framework, implemented under the coordination of FUNKA and supported by HTS, with active contributions from WP leaders. The strategy will be developed during the initial stages of the project (M3) and will be presented in the deliverable D6.1 Communication and dissemination plan. The strategy will also include communication and dissemination success indicators which will allow the project consortium to gage the impact of the different actions and adapt the strategy during the course of the project should it be required.

Task 6.2. Project visual identity and communication materials (M1-M36). Lead partner FUNKA; participants: MUG, AMEU, MU, UNIUD, HK, ESENFC, HTS. Based on the specifications defined in D6.1, the project's visual identity will be defined to support the project in communication and dissemination activities. The visual identity will be presented in D6.2 Visual Identity Manual and will consist of a series of elements representing the project as a whole. These elements will used by all partners in synergy with the communication and dissemination strategy and will include in the very first release: Project logo; Standards manual; Templates; email signature; Digital Brochure/leaflet model and web and social media banners and covers. FUNKA will also coordinate the production of the communication and dissemination materials established in D4.1 (e.g. Social media visuals, infographics) following the visual identity guidelines set out in D4.2. The content for the materials will be provided by the designated communication managers for each of the WPs. Additional communication and dissemination materials to those planned in D4.1 will be produced according to project needs. HTS and the WP leaders will be involved in these activities.

Task 6.3. Community Care project website (M1-M36). Lead partner FUNKA; participants: MUG, AMEU, MU, UNIUD, HK, ESENFC, HTS. The Community Care project website will be the centrepiece of the communication and dissemination strategy. It will be designed and developed from the beginning of the project and will be ready in M3. The main objective of the website is to provide information about the COMMUNITYCARE project and present the results achieved in an accessible and easy to use format. It will also feature the latest news, events and key documents related to the project and to the active and healthy ageing field as a whole. The project website will be updated on a regular basis throughout the project.

Task 6.4. Scientific Dissemination (M13-M36). Lead partner: UDPV; All partners: MUG, AMEU, MU, UNIUD, HK, ESENFC. This task will focus on the dissemination of results to the scientific community including organised events (scientific meetings, conference sessions and workshops) and the development of dissemination products such as: articles in peer-reviewed journals, special issues in ISI and scopus journals, reports, course materials. Special attention will be given to the production of joint publications between the beneficiaries and to the editing of journal special issues regarding the COMMUNITYCARE topics.

Task 6.5. Communication, dissemination and engagement activities (M1-M36) Lead partner FUNKA; participants: All partners The goal of this task is to ensure widespread visibility and awareness about the project, disseminate its results and engage stakeholders in the project activities. Regular information will be uploaded onto the project website's news and events section which will subsequently feed the social media channels. A quarterly electronic COMMUNITYCARE newsletter will be designed and widespread through a direct mailing marketing platform and made available on the web portal. The main communication and dissemination activities during the COMMUNITYCARE project will be organized through media campaigns. These campaigns will be planned in D6.1 and will aim to promote key activities and disseminate project results. They will activate all communication and dissemination channels with a strong focus on social media (twitter, LinkedIn and YouTube). In addition to the planned campaigns in D6.1, ad hoc campaigns may also arise due to specific needs arising from the project or third parties such as the European Commission.

Description of Deliverables: D6.1 Communication and dissemination plan. It will establish the communication and dissemination objectives for the project, highlight the key messages, identify the main target groups, detail the main communications actions to be carried out (e.g. media campaigns) and responsibilities, plan the communication materials to be produced and define the communication and dissemination channels and tools that will be used to reach each of the target groups. D6.2 Visual Identity Manual. It will incorporate a series of elements representing the project as a whole. These elements will used by all partners in synergy with the communication and dissemination strategy. D6.3. C project website. It will include a description of the accessible and usable project website, with technical specifications and guidelines on how to use it. D6.4. Communication and dissemination yearly report. It will provide a report on the activities carried out including KPIs and highlighting the impact of the media campaigns and D6.5 Dissemination Event at FUNKA

Work Package Number: 7					Start/end Month 1/36

Work Package Title: Project management

Lead Beneficiary: MUG

beneficiary	MUG	UPV	UNIUD	UB	HTS
PM	6	2	2	1	2

Objectives: Guarantee full synergy and integration among COMMUNITYCARE participants to provide added European value and extend the state of the art on Active Ageing. This will facilitate the following outcomes: maintenance of a defined time-schedule of the research, achievement of the planned objectives, immediate recognition of problems, mitigation strategies, and financial management.

WP7 is divided into 4 tasks, all of them led by MUG and all of them from month1 to month36.

Task 7.1. Set up of project organizational structure, Consortium Agreement and project tasks supervision (all beneficiaries participate in this tasks). Measures will be taken to guarantee validation and verification of project results, ensure that plans are fulfilled and implement necessary corrective actions. One annual meeting of all partners (beneficiaries and TCs) will be organized by the end of the year and 1 skype call per month will be scheduled by MUG with all beneficiaries (mandatory for them) and TCs (not mandatory).

Task 7.2. Administrative Management. The goal of this task is to ensure on-time provision of periodic project reports, and cost statements, to handle the project reviews and payment issues.

Task 7.3. Risk evaluation and corrective actions. The management of risks and corrective actions to be taken will be handled for the entire duration of the project in order to identify, quantify, track and mitigate risks within the project.

Task 7.4. Intellectual Property Rights (all beneficiaries participate in this task). The Intellectual Property resulting from this project will be properly managed and protected. A Consortium Agreement will be prepared to define consortium members rights and duties, and to handle IPR issues and licensing arising during the project.

Description of Deliverables: WP7 has 5 deliverables detailed in Table B3a below that consist on the Consortium Agreement signed on month 3 with also the web-site creation by MUG, 2 progress and 2 activity reports as required in the guidelines.

Table B3a – Deliverables list

Scientific Deliverables

Deliverable Number	Deliverable Title	WP No.	Lead Beneficiary Short Name	Type	Dissemination Level	Due Date
1.1	International Fall Prevention Policies and Active and Healthy Ageing Practices: critical review and comparison	1	ESENFC	R	CO	18
1.2	Key Performance Indexes for Fall Prevention and Rehabilitation	1	ESENFC	R	CO	18
1.3	Risk mitigation with Age-friendly environments	1	ESENFC	R	CO	36
1.4	Fall prevention and rehabilitation in Long-term-care systems	1	ESENFC	R	CO	36
2.1	Models and methods for Early Diagnosis of Frailty and Sarcopenia	2	UNIUD	R	CO	24
2.2	Advanced Therapies for Frailty and Sarcopenia	2	UNIUD	R	CO	28
3.1	Model of fall prevention and rehabilitation systems	3	MU	R	CO	36
3.2	Validation of fall prevention and rehabilitation systems	3	MU	R	CO	36
4.1	Fall Detection System: Common Dataset	4	AMEU	R	CO	18
4.2	Fall Detection System: Data collection model	4	AMEU	R	CO	18
4.3	Fall Detection System: Data analysis methods	4	AMEU	R	CO	36
4.4	Fall Prevention System: Value Creation	4	AMEU	R	CO	36
5.1	Map of all Ecosystem's stakeholders and their commitments	5	HK	R	CO	16
5.2	Strategy and action plan validated by all Ecosystem stakeholders	5	HK	R	CO	20
5.3	Digital Platform for Data and information sharing "Connector"	5	HK	R	CO	24
5.4	Materials and content for training and advocacy programmes	5	HK	R	CO	22
5.5	Evaluation methodology plan and design	5	HK	R	CO	26
5.6	Repository of Funding/business model for innovative interventions	5	HK	R	CO	28
5.7	Dissemination material and events with other Ecosystems in Europe	5	HK	R	CO	30

Management, Training, and Dissemination Deliverables

Deliverable Number	Deliverable Title	WP No.	Lead Beneficiary Short Name	Type	Dissemination Level	Due Date
6.1	Dissemination Plan	6	FUNKA	R	PU	6
6.2	Project visual identity manual	6	FUNKA	PDE	PU	6
6.3	COMMUNITYCARE project website	6	FUNKA	PDE	PU	12
6.4	Communication and dissemination yearly report	6	FUNKA	R	PU	12, 24, 36
6.5	Dissemination Event at FUNKA	4	FUNKA	PDE	PU	24
7.1	Partners Agreement signed by all partners	5	MUG	ADM	PU	3
7.2	Progress report YEAR1	7	MUG	R	PU	12
7.3	Activity report YEAR2	7	MUG	R	PU	24
7.4	Progress report YEAR3	5	MUG	R	PU	36
7.5	Final International Workshop at MUG	4	MUG	PDE	PU	36

Table B3b – Milestones list

Nr.	Title	Related WPs	Lead Beneficiary	Due Date	Means of Verification
M1	Kick-off and annual meetings during which all project partners will present results and attend seminars organised by each Annual Meeting organizer	5	MUG	3, 12, 24, 36	Minutes of meeting, website documents
M2	Formal invitation to all stakeholders to join the Stakeholder Panel	4, 5	MUG	3	Invitations and responses
M3	Revised dissemination plan validated by the Stakeholder Panel	4	FUNKA	12	Report validated and published in the project website
M4	Analysis and comparison of International Long-term care policies and active and healthy ageing management practices	1	ESENFC	24	Analysis completed and validated by all partners during the second annual meeting
M5	Deliverables 1.3, 1.4, 2.1, 2.2, 3.1 presented and validated	2	UNIUD	36	Reports presented and validated by all partners during the third annual meeting
M6	1 Special issue edited by ERs from COMMUNITYCARE partners in an international journal ISI on the COMMUNITYCARE topics	4	HK	36	Special issue final publication
M7	Age-oriented motion capture system integrated with immersive reality in the MUG lab	3	MUG	36	Laboratory prototype completed and running
M8	Final International workshop with the definition of management recommendations based on the results of WP1, WP2, WP3	4	MUG	36	Workshop proceeding and web page

4.2 Appropriateness of the management structures and procedures, including quality management and risk management

The partners will act under a strong and well-organised management structure, encompassing four levels: the Project Coordinator (PC), the Steering Committee (SC), an External Advisory Board (EAB) and a Stakeholder Panel (SP).

The partners will act under a strong and well-organised management structure, encompassing four levels: the Project Coordinator (PC), the Steering Committee (SC), an External Advisory Board (EAB) and a Stakeholder Panel (SP). The Project Coordinator will be responsible for the strategic direction of the project activities; act as the contact person with the REA and accept the legal responsibility for all the project aspects that are derived from the contract signed with the REA; take any final decisions after consulting with the SC; be responsible for the strategic administration of the partners; monitor the compliance by beneficiaries with their obligations under the grant agreement; take the burden of financial operation (administer the community financial contribution, keep the record and financial accounts, inform the REA of the distribution of the Community financial contribution).

The Steering Committee (SC) will be composed by the main investigators of each project partners, and it will be chaired by the Project Coordinator. The SC will provide advice and support to the Coordinator in governing the scientific life cycle of the project. The SC will convene at each annual COMMUNITYCARE meetings to monitor the secondments and research progress towards the programmatic objectives and will maintain constant contact by e-mail or telephone in order to tackle rapidly and efficiently any scientific and secondments issues arising during the project. The SC is also responsible for approval of amendments to the Partners Agreement, and premature completion/termination of the project. At the kick-off meeting, the SC will nominate the persons in charge of IPR protection/Industrial development, Ethics, Gender and Equal Opportunities. The person in charge of IPR protection/industrial development will contribute to drafting and update the plan for disseminating scientific knowledge and exploiting project outputs. The External Advisory Board (EAB), will be composed of 4 external international recognized experts identified during the Kick off the meeting by the SC.

The Project Management tasks have been divided into Research Management and Administrative Management. Research Management under the responsibility of the Coordinator and Administrative Management under the responsibility of a Project Manager, who will be an expert already enrolled at the Medical University of Graz with previous large experiences in the Marie Curie projects and especially in RISE program.

The Coordinator will have regular contacts with the partner Universities to assess the progress of the secondments and research work, monitor progress towards milestones and deliverables and maintain a team spirit. Specific research managerial tasks are: organising the proper actions to administer the scientific life cycle of the project; carrying out day-to-day management, communication and coordination of the reporting activities; coordinating the SC and the SP; monitoring the progress of the research work, manage the project web-site and implement dissemination and public awareness activities.

The Project Manager will perform the following administrative tasks: coordinate the negotiation phase; ensure EU Commission administrative guidelines are correctly followed by the participants; perform a correct administrative management of the EU Commission funding; coordinate the administrative bodies of the different participants' institutions; collect all the information requested by the EU Commission for the proper administration of the project; coordinate the preparation of administrative periodic reports; tackle and solve administrative or contractual issues

within the partnership and with the EU Commission; follow legal issues (Partners Agreement) and ethical issues. In order to facilitate these operations, the Project Manager will be assisted by the International Research Office at MUG.

Overall, COMMUNITYCARE Academy partners will ensure that all the scientists involved in the project are following the good practices and research strategies of the the institutions they represent. This will not only allow them to participate fully but also ensure that they are appreciated by the institutions in they work and their research will be highlighted as excellent thus gaining scientific and individual reputation of the partners.

4.2.1 Progress monitoring, evaluation of individual projects and communication

The SC will review the research and secondments activities of each ER and ESR and provide advice to partner members on immediate tasks and objectives, and longer-term strategic planning. Communication between partners will be supported during the 4 years by a strong effort from the Coordinator and from the SC: the first level of communication within the partners will be represented by the website, which will allow each partner to participate in the project workflow through a web browser. The website will encompass private and public areas. Further communication between partners will take place by e-mail, phone and monthly-scheduled Skype-calls (one per month is essential to keep the constant attention on the project activities), while communication among fellows will exploit, as already experienced with other RISE projects, tools of social networking (e.g., a Facebook page), group communication (e.g., WhatsApp, Twitter) and geolocalisation (e.g., Foursquare).

Once a year, during the Annual Meeting, the Advisory Committee and the Steering Committee will meet and validate the achieved deliverables. In this occasion, a specific session will be dedicated to meet the Stakeholder Panel and, when possible, making some visits to their local industrial plants.

4.2.2 Decision Making and conflict resolution

The SC will take the major decisions concerning the work plan, for example decisions dealing with a substantial change in task responsibility and budget as well as decisions regarding the strategies of one or more research parts. For all decisions, the SC will decide according to a majority vote. The table B3c identifies the main risks foreseen by partners.

Table B3c – Risk List

RN	Description of Risk	WP Nr	Proposed mitigation measures
1	Internal risks such as (1) underestimation of some tasks, (2) low productivity and (3) low quality. Partners fail to perform/deliver tasks in a timely manner	All	Internal risks will be minimized and managed by using established methodologies for cost estimation, project planning and control. Such methodologies are standard practice in the professional work of the project manager.
2	Intellectual property (IP) issues (lack of confidential information, conflict between partners)	WP 1-5	IP will be covered both by a Partners Agreement and through bilateral agreements signed a priori
3	Delay in planned secondments	All	Finding out reasons for delays and preparation of new schedule or assigning tasks to new ER or ESR. Research plan or allocation of activities between partners will be adapted to reach the objectives.
4	Delays in preparation of reports	All	Finding out reasons for delays and preparation of new schedule for reports or assigning tasks to new ER or ESR.
5	A partner is leaving or being unable to perform a task within the given schedule or budget allocated to it.	All	Activities will be done by other partners, if not a call for expressions of interest from new partners to fill the gap.

4.3 Appropriateness of the institutional environment (hosting arrangements, infrastructure)

COMMUNITYCARE Academy will through partner organization expose the ESR to the most stimulating research and research training environment which offers appropriate equipment, facilities and opportunities, including for remote collaboration over research networks. This is important as remote collaborations are required such as now with the COVID-19 pandemic.

4.3.1 Availability of the expertise and human resources

In COMMUNITYCARE are included 17 of the highest ranked universities from EU Member states and from third countries, with large experience in different but interrelated research fields. The 9 EU Academia are well established and recognized institutions in their countries and in Europe. These institutions have consistent number of professors and

researchers already engaged in the specific fields proposed in each WP that guarantees a consistent pool of human resources with specific expertise relevant to the project and back-up personnel. In addition, the 9 EU partners have strong ties with local and international companies and also some of them are involved at coordination level in the EIP AHA related activities (e.g. MUG`s Regina Roller Wirnsberger is an active member of Action group A3 (frailty) while Nandu Goswami is a member of the coordinating team of Action group 2(falls prevention), some are coordinating Doctoral Courses (MUG, UNIUD,)or educational Programs (European Academy of Aging: EUGMS, Master of Active and Healthy Aging Aging) and also chairing international conferences (ICFC) and international Gerontological and Geriatrics committees (EUGMS; MUG's Goswami is the national contact point of falls prevention in Austria). UNIUD will provide expertise related to molecular aspects and physiology of aging and falls, Prof. Gianluca Tell, head of the Laboratory of Molecular Biology and DNA Repair, is also coordinator of the Active Ageing group and Prof. Bruno Grassi is head of the Laboratory of Exercise Physiology. Other experts in this project will provide expertise related to geriatric immunology, food science as well as nutrition, Nutrigenomic and epigenetic regulation. Several collaborations already exist between UMN and MU, MU and TU, WASU and MUG, PUC and UB, AMEU and UAM, ICEPS and SFNSMU, SFU and MUG, AIIMS and UNIUD, AIIMS and MUG, UPV and UAM.

The participating 8 TC universities have already identified the personnel to allocate to the project and all of them have a sufficient pool of experienced researchers already engaged in other complementary running projects in their countries with a planned availability for COMMUNITYCARE on time with the start of the research activities of the project. The participation of FUNKA and HTS will give to the project a unique opportunity for an efficient dissemination of the results, especially as it is involved in coordinating an EIP AHA related project and is interacting with all the key players in Europe who are working in different action groups of the EIP-AHA in all aspects of aging care. This synergy of EIP-AHA and FUNKA and HTS, which works closely with key stakeholders in aging care in Austria and Europe, including companies providing AAL technologies, will go a long way in ensuring sustainability of the expertise and human resources related to aging care in Europe and beyond.

4.3.2 Appropriateness of the institutional environment

All the hosting arrangements and university infrastructures will assure a very high-quality level and the offices and laboratories in which the ERs and ESRs will spend the secondments will be equipped with the last generation equipment. They all have classrooms and laboratories equipped with multimedia devices (projectors, beamers, computers...) for doctoral, post-doctoral education and research purposes. The research facilities are as follows:

Table: Research Facilities

MUG: Cardiovascular function testing, Tilt table testing for syncope assessment, innovative tools for falls prevention (resistive vibration exercise), exercise testing, postural control and falls, frailty markers
AMEU: Tension myography for assessing role of muscles in posture and balance, IT department for digital processing of data, information processing
MU: Devices related to measurements of physical fitness, falls, cardiovasculare rehabilitation, neuronal rehabilitation, rehabilitation of gait in traumatology and elderly, assessment of vascular function
UNIUD: Cell Imaging Platform, Electronic Microscopy and Nanoscopy; Genomics and Bioinformatics Platform; Instrumentation of e-learning, telemedicine and video surgery; Exercise Physiology Laboratory
HK: Equipment for testing muscle strength and endurance, balance, EMG, ECG and circulatory variables
UPV: Computational Intelligence Lab, equipment for functional testing and control of movement and muscle activity.
ICEPS:Is affiliated with several clinical facilities, which have state of the art devices for research.
ESENFC: Equipped to develop training and experimental, oriented, and applied research activities, as well as to intensify applied and experimental research, and promote entrepreneurship through business involvement.
UB: Immersive virtual reality systems, force sensors to assess dexterity, motion tracking system.
SFU: Non-invasive physiological monitoring devices, which can be used in a number of environments. These include assessment of older persons and research into conditions associated with transitions to frailty.
TU: Devices related to measurements of falls, cardiopulmonary exercise testing, assessment of autonomic nervous system and the studying the underlying mechanisms of falls and how falls can be prevented.
UMN: Computer programs for the chronobiologic assessment of dynamic changes in physiological variables

SFMSMU: Devices for assessment of postural control, gait, balance and studying the underlying mechanisms of falls
WASU: State of art equipment for determining cardiovascular function.
AIIMS: Excellent research laboratories for assessing cardiac, autonomic and vascular function in aged persons
Clinical research facilities (collaboration with FLENI, including access to MRI and PET equipment)
FUNCA: Infrastructure for the development of health technologies such as: new materials and prostheses, image processing, laser diagnosis and treatment, computer-assisted medicine.
HTS: Non-academic partner but has the necessary infrastructure to carry out dissemination (WP6)

4.4 Competences, experience and complementarity of the participating organisations and their commitment to the action

4.4.1. Adequacy of the partners to carry out the action and how participating organisations' synergies and complementarities will be exploited.

The adequacy of the partners to carry out the action is already discussed in paragraph 2.2.1.While some project partners have collaborated on different researches in the past, the specific focus of the COMMUNITYCARE project on frailty and falls will provide for the first time an international network of partners all interested in research and innovation in aging care. Even if each partner has a specific approach and give to a project a specific research point of view, most of the partners are closely linked and capable to create in a short future advancement of knowledge and research in aging care. In particular each scientific WP(1-5) has been designed to maximize the possibility of efficient cooperation and to achieve efficient synergies between partners. **All the partners will be involved in all the WPs**. As an example, The WP1, led by the leading institute in Portugal ESENFC, will enable MUG, AMEU, UPV, ICEPS, SFU, SFMSMU, WASU, AIIMS, PUC to strengthen their knowledge on aging care by examining literature related to frailty, falls and also to comparing and assess different kinds of strategies for fall prevention. Moreover SFU, SFMSMU, WASU, AIIMS and PUC will benefit from the social gerontological dimension of aging care provided by AMEU and ICEPS. It is expected that in this WP, UPV will also collaborate with TU and SFMSMU and provide knowledge transfer in the area of digital technology and how it can be used in aging care. Similarly, the WP2, led by UNIUD, will offer a unique opportunity to examine frailty and falls in translational dimensions. Aspects such as molecular biology, personalized medicine and innovative approaches in aging care via traditional and new exercise protocols will be discussed and shared with partners such as MUG, SFMSMU, WASU and AIIMS. It is expected that this WP will lead to innovative research and knowledge transfer will occur in molecular and translational physiology, as frailty factors will be examined at molecular level. Exercise roles will be assessed at systemic level. Finally, COMMUNITYCARE Academy will be equally distributed in EU and TCcountries as frailty and falls are a common problem for all the countries involved. Therefore, all the partners will be be involved in WP5-7.