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Reference Sites Network for Prevention and Care of Frailty and Chronic Conditions in community dwelling persons of EU Countries

D6.3 SUNFRAIL MODEL OF CARE ON FRAILITY AND MULTIMORBIDITY

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1 For **deliverables**: **R** = Report; **P** = Prototype; **D** = Demonstrator; **S** = Software/Simulator; **O** = Other

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SUNFRAIL MODEL

Background

Population ageing is accelerating rapidly worldwide, from 461 million people older than 65 years in 2004 to an estimated 2 billion people by 2050, which has profound implications for the planning and delivery of health and social care. The most problematic expression of population ageing is the clinical condition of frailty.

Although frailty is not an inevitable consequence of ageing, it is often conceptualized in the context of health care services as a state of late life decline and extreme vulnerability characterized by weakness and decreased physiologic reserve contributing to increased risk for falls, institutionalization, disability, dependence and death. It develops as a consequence of age-related decline in many physiological systems, which collectively results in vulnerability to sudden health status changes triggered by minor stressor events (Clegg et al., 2013).

Overall, frailty is defined within two main paradigms: biomedical and bio-psycho social. According to the biomedical paradigm (Fried et al., 2004), frailty is defined as a “physiological syndrome characterized by reduction of functional reserves and resistance to “stressors” due to a cumulative decline of physiological systems causing vulnerability and adverse events”. The **bio-psycho social paradigm** (Gobbens et al., 2010), defines frailty as “a dynamic state affecting individuals with losses through one or more functional domains (physical, psychological and social), increasing overall the risk of adverse outcomes”. Within this approach, several factors are taken into account, such as the medical, environmental, educational, economical and psychological aspects, requiring overall a more holistic viewpoint of patients and their predicament.

Studies performed during the last 20 years have progressively demonstrated the importance of the concurrence of multimorbidity and frailty. Chronic diseases are responsible for poor quality of life, worse functional capacity and the majority of deaths in developed countries, mainly due to cardiovascular diseases, cancer, respiratory diseases and diabetes (Non communicable diseases Country Profiles, WHO Global Report 2011; Global Status Report Non communicable diseases, WHO, 2010; Prados-Torres, 2014). Moreover, multimorbidity is more frequently found in the ageing population, and poses new challenges to the health services, in terms of professional’s skills, resources and organizational aspects.

As frailty and multimorbidity have been found in 46.2% of the population and there is a frequent overlapping with disability (Fried et al., 2004), it becomes extremely important to develop interventions aimed at the early detection, prevention and management of frailty. Due to the complexity of the problem, frailty and multimorbidity need to be considered with a more holistic approach, requiring an integrated, multi-domain and multi-professional strategy especially focusing on community based settings and primary care services. Developing approaches and methodologies to detect and measure frailty in routine clinical practice, and especially in primary care, the use of existing patient data records represents a current challenge, as well as developing appropriate and effective preventive and curative measures (Clegg et al., 2013).

The population progressive ageing trend and the increased demand for health and social care, coupled with countries reduced resources for health and social services, further hamper the access to care for individuals with frailty and multimorbidity, especially in people with lower economic status, thus requiring a more comprehensive approach, as foreseen by the bio-psycho social paradigm. This poses additional problems in terms of equity of care, and calls for strengthening early detection to allow prevention and effective care of frailty and appropriate management of multimorbidity as the more cost-effective measures.

In 2012 the European Commission has launched the Innovation Partnership on Active and Healthy Ageing (EIP-AHA): a pilot initiative to face the population ageing challenge by increasing the average healthy lifespan of EU citizens by two

years by 2020. The initiative main objectives are to improve the health and quality of life of older people, the sustainability and efficiency of health care systems, and to support growth and market opportunities through innovative products and services. The Partnership focuses particularly on the involvement of key stakeholders from the Regional and Local level (users, public authorities, industry) in the adoption of innovative approaches to address health services demand, identify adequate offer and implement large scale adoption according to existing regulation.

Building upon a process of identification of good practices on Healthy and Active Ageing by regional and local health administrations, Action Groups and Reference Sites were identified respectively as the scientific/operational and institutional pillars supporting the EIP-AHA partnership. Reference Sites have been selected by a peer-to-peer review system to contribute to support the scale-up of the most effective innovative approaches responding to this challenge and based upon their integration with loco-regional systems.

Since July 2013, the Regional Agency for Health and Social Care of Emilia-Romagna (ASSR-RER), along with other Italian Regions (Piemonte, Liguria and Campania) and European Regional Institutions have been appointed the status of EIP-AHA Reference Sites. Their role is to exchange good practices within the Reference Site Collaborative Network and in collaboration with the Action Groups, at the same time strengthening their transfer and large scale adoption at the local level. With the ACTION PLAN of A3 Action Group on “Lifespan Health Promotion & Prevention of age related frailty and disease” the European Innovation Partnership on Active and Healthy Ageing indicates the need for a better understanding and measure of the risk factors for frailty as a prerequisite for implementing programmes for early detection, prevention and management to reduce dependency, contain future demand, improve outcomes and enhance quality of life.

The EIP-AHA initiative has developed several actions addressing frailty and multimorbidity through the work of specific Action Groups: Prescription and Adherence (A1), Lifespan Health Promotion & Prevention of age related frailty and disease (A3) and Integrated Care (B3).

The analysis of current methods for the identification, prevention and management of frailty and for optimizing the care of chronic conditions (multimorbidity) suggests a great variety of approaches and levels of development within EU countries contributing to the EIP-AHA initiatives, that complicate the assessment of their effectiveness and potential for innovation and replicability within the EU.

Available instruments to assess frailty are not consistently used across EU countries, and generally do not take into account the bio-psycho social paradigm. This hinders the exploitation of innovative approaches and tools to prevent frailty, as their ability to capture the complexity of frailty phenomenon is still unknown. There is need to develop a novel approach to frailty based on the complete evaluation of biomedical and bio-psycho social aspects, to standardize existing procedures on frailty and multimorbidity, and to develop new integrated techniques on the methodological and organizational levels in order to create standardized interventions that can take advantage of innovative approaches to this relevant health issue.

On the final beneficiaries side, according to the WHO document on active ageing (WHO, Active Aging: A Policy Framework, WHO, Geneva, Switzerland, 2002), the key aspects of active ageing are (1) autonomy, intended as the perceived ability to control, cope with, and make personal decisions about day-to-day life; (2) independence, that is the capacity of living independently in the community; (3) quality of life that is “an individual’s perception of his or her position in life, in relation to their goals, expectations, standards, and concerns.”

As people age, their quality of life is largely determined by their ability to maintain autonomy, independence, social involvement and healthy life expectancy, which is how people can expect to live longer without disabilities. Active ageing appears as an outcome of different determinants that should allow to identify particular profiles that are more at risk or, on the other hand, are more favourable to age actively (Paúl et al., 2012).

Therefore, in order to design sustainable services responding to population ageing trends and related needs, it is important to assess the risks of frailty within the bio-psycho social domains, and to activate care pathways that integrate innovative approaches within the perspective of prevention of frailty and healthy ageing.

Objectives

The general objective of the SUNFRAIL project is to improve the identification, prevention and care of frailty and the management of multimorbidity in community-dwelling older persons (aged 65 years and over) within local and regional settings of EU countries, through the design, implementation and scale-up of innovative care models.

This has been achieved through the general assessment of Reference Sites health and social systems, and particularly how these address frailty and multimorbidity at the national and local level, how health and social services have been designed and organized, in terms of screening, diagnosis and care pathways within the health, social and community settings. The assessment of human resources capacity and development programmes completed this assessment, indicating the need for a multidisciplinary perspective in the set up of education and training programmes for health professionals. Overall, the assessment of patients and beneficiaries perception on the concept of frailty, and expectations toward services and care complete the frame of the care models of partner countries, and set up the foundations for the integration of innovative and sustainable large scale approaches.

The proposed model is based on the analysis of the identified systems of care, as well as on related good practices and emerging gaps. The SUNFRAIL project will address the challenge of experimenting new tools for the early identification of frailty and multimorbidity, and how and whether the latter allow the subsequent activation of pathways of care within community based health and social care settings in different EU countries.

An operational definition of frailty and multimorbidity

Frailty is often conceptualized by health care providers as a state of late life decline and extreme vulnerability characterized by weakness and decreased physiologic reserve contributing to increased risk for falls, institutionalization, disability, and death. It develops as a consequence of age-related decline in many physiological systems, which collectively results in vulnerability to sudden health status changes, triggered by minor stressor events (Clegg et al., 2013).

Overall, frailty is defined within two main paradigms: biomedical and bio-psycho social. According to the biomedical paradigm (Fried et al., 2004), frailty is defined as a “physiological syndrome characterized by reduction of functional reserves and resistance to “stressors” due to a cumulative decline of physiological systems causing vulnerability and adverse events”.

The bio-psycho social paradigm (Gobbens et al., 2010) defines frailty as “a dynamic state affecting individuals with losses through one or more functional domains (physical, psychological and social), increasing overall the risk of adverse outcomes”. Within this approach, several factors are taken into account, such as the medical, environmental, educational, economical and psychological aspects, requiring overall a more holistic viewpoint of patient and their predicament.

Studies performed during the last 20 years have progressively demonstrated the importance of the concurrence of multimorbidity and frailty. Chronic diseases are responsible for poor quality of life, worse functional capacity and the majority of deaths in developed countries, mainly due to cardiovascular diseases, cancer, respiratory diseases and diabetes (Non communicable diseases Country Profiles, WHO Global Report 2011; Global Status Report Non communicable diseases, WHO, 2010; Prados-Torres, 2014). Moreover, multimorbidity is frequent in the ageing population, and poses new challenges to health services, in terms of professional’s skills, resources and organizational aspects.

As frailty and multimorbidity have been found in 46.2% of the population and there is a frequent overlapping with disability (Fried et al., 2004), it becomes extremely important to develop interventions aimed at the early detection, prevention and management of frailty conditions, that can take advantage of new tools to delay disability and loss of function. Due to the complexity of the problem, frailty and multimorbidity need to be considered with a more holistic approach, requiring an integrated, multi-domain and multi-professional strategy especially focusing on community based settings and primary care services. To develop methods to detect and measure frailty in routine clinical practice, and especially in primary care, utilizing existing patient data records represents a current challenge, as well as to develop effective preventive and curative measures (Clegg et al, 2013).

The word 'frailty' is often misused, both in research and among professionals, considering concepts as 'disability' and/or multimorbidity as synonyms of frailty. It is therefore relevant to state that frailty may be prevented and can be reversible with targeted interventions, to avoid its evolution over time towards disability and dependency.

WP4 of SUNFRAIL has carried out a literature review as a first step to support the design of an innovative model for frailty identification, prevention, care and management of multimorbidity. The review was made to identify experiences about services designed for the detection, prevention and management of frailty and multimorbidity. On the basis of the findings, during the first project transnational workshop involving international experts, the project partners, national and local stakeholders have agreed on defining frailty according to the bio-psycho social paradigm.

The assessment made on beneficiaries perception on the concept of frailty and on the barriers to care highlights a strong aversion to the term frailty, as in the common understanding it refers to a total loss of independence; an irreversible state that some older adults experience in the very final stages of their lives. As older people major concern is to maintain independence, when experiencing the early clinical symptoms of frailty, they usually do not automatically look for external sources of support, particularly from General Practitioners (GPs), as they believe that doctors should not be 'bothered' with non-clinical conditions. Their first instinct is to look for their own solutions/self-identified coping mechanisms rather than external sources of support, considered as being synonymous with a total loss of independence and of freedom of choice; thus to be avoided for as long as possible.

SUNFRAIL has faced both challenges to approach frailty according to the bio-psycho social paradigm and bridging the gap between services offer and utilization, with the objective to support early identification and prevention of this condition through innovative approaches.

The Scenario

Synthesis, common elements and main differences

1. ASSESSMENT OF PARTNERS HEALTH AND SOCIAL SYSTEMS

The 'Assessment of partners' Health and Social Systems' (Task 4.2.2), was performed by collecting data from official documents and submitting a questionnaire to each reference site. The questionnaire aimed at collecting information regarding the strategies, policy framework, and programmes to address frailty and multi-morbidity in the Regions represented in the Sunfrail project.

To understand the scenario where these actions have been undertaken, information on the characteristics of the population (through demographics and socioeconomic indicators), as well as information on Health and Social systems, were collected. Given the availability of accurate, and timely information at national level from official documents (in particular from Eurostat and from the Reports of the European Observatory on Health Systems and Policies), key national data and basic information were provided to Reference sites representatives for completion and validation. In details, the questionnaire submitted to Reference sites was divided into 5 sections:

Section A. – National Data Overview

Section B. – Selected Regional data for Reference Site

Section C. – Health System Overview

Section D. – Social System Overview

Section E. – Frailty and Multimorbidity as a challenge for the Health and Social Systems

The produced report contains a summary of country and regional highlights on the organization of the Health and Social systems, resulting from an accurate reading of the questionnaires received by reference sites, integrated with some parts from the Health Systems in Transition² reports and from other information provided by the national institutional websites (where available in English). Data from national and regional official statistics (Eurostat and OECD data) representing key social and economic issues connected with aging and frailty were also integrated. The objective of the synthesis effort was to achieve a harmonized country and regional based overview of health and social care systems, stressing, when provided, the regional actions targeted at older adults and frail subjects.

1.1 Governmental level responsible for publicly funded health and social care

The table 1 below summarizes the type of prevailing social and health systems arrangements in the countries participating in Sunfrail. Key features of the Sunfrail partners are i) the presence of a tax-based national health system in Italy, Spain and Northern Ireland, the well-known statutory health system in France, requiring universal mandatory coverage - and, finally, the universal health system in Poland also requiring mandatory insurance for residents through a single payer *Social Insurance Institution* (ZUS). Beside the main insurer, the health system can be characterized by a secondary form of health insurer which, in some of the selected regions, corresponds to private expenditure at the point of use (out of pocket payments.)

² <http://www.euro.who.int/en/about-us/partners/observatory/publications/health-system-reviews-hits>

The social care system and its level of integration with the health sector are more difficult to classify, as it refers to the complex organization of the Welfare state in which our reference sites are. Nevertheless, social security -which includes pensions, housing and inability subsidies- is guaranteed at national level, yet typically provided by Municipalities, the administrative entities closer to the community and the families (or by the territorial Health and Social Care trusts of Northern Ireland). No systematic integration with innovative approaches was detected in any of the analysed systems. Therefore, the table below attempts to synthesize briefly the key features of the integrated social care and the responsible level.

Table 1. Reference Sites Social and Health Systems

Country	Region	Prevalent type of Health system	Governmental level responsible for publicly funded social care	Integrated, social care
France	Midi-Pyrénées, Languedoc-Roussillon	SHI & VHI Multiple insures with automatic affiliation	Statutory Health Insurance (<i>Caisses de Sécurité Sociale</i>) in collaboration with General Councils	ARS & SHI regional branches
Italy	Campania, Emilia-Romagna, Liguria, Piemonte	NHS & OOP*	Municipalities and regional health system in a combined effort	Municipalities & Local health Units
Poland	Łódź	SHI & OOP* Single payer ^a	Municipalities	Municipalities (<i>Powiat</i>) & Social assistance centers
Spain	País Vasco	NHS & OOP*	Department of Social Affairs, Diputaciones	Municipalities & Health service centers
United Kingdom	Northern Ireland	NHS & OOP*	Department of Health	Arms Length Bodies (ALB) such as Health and Social Care Board, Public Health Agency, GPs and local Health & Social Care Trusts

Legenda: SHI = Statutory health insurance, VHI = Voluntary health insurance, OOP = Out of pocket, NHS = National taxed based health system

*Increasing role of Voluntary and supplementary health insurance

** according to social security responsibility in provision

^aSource: *OECD Health System Characteristics Survey 2012* and Secretariat's estimates (as of April 2014)

For further details on Reference sites national and regional health and social systems see the full report on the following link: <https://issuu.com/sunfrail/docs/healthandsocialsystems.20.11.2016.fi>

1.2 Key Demographic and Macroeconomic Data

Data presented in the tables A 1 - A 4 in annex I include and integrate the information provided in section B of the questionnaire: "Selected regional population data for Reference Site".

The data cover the key demographic, economic and social dimensions relevant to the ageing phenomena. Far from being exhaustive, the selection of data allows, however, to observe some trends:

The majority of the Regions represented in the Sunfrail project - Midi-Pyrénées, Languedoc-Roussillon, Piemonte, Liguria, Emilia-Romagna, Northern Ireland, the País Vasco, Campania and Łódź-Poland - all seem to share the common challenge of an increasing proportion (above the national average) of people aged 65 and over as a proportion of total population in year 2014;

Life expectancy at birth is higher in Western European countries than East European ones, and particularly in women. Italy and Spain show the highest indicators of life expectancy, old age and economic old age dependency ratios, indicating a greater social challenge related to ageing (table 2 below), although significant differences emerge between regions;

There is a positive correlation among Regions with a greater health expenditure (expressed as proportion of Public health expenditure and per-capita current health expenditure), and the proportion of older adults referring living in 'good' and 'very good health' (in particular: Italy, UK and France);

Conversely, as displayed on Fig. 1 below, self-referred unmet needs (both for medical and dental care) are higher where private out-of pocket health expenditure is higher (Poland, Spain and Italy), indicating an overall equity problem among participating regions.

Indicators such as "people at risk of poverty and deprivation material" are heterogeneously distributed among partner regions, in some cases independently from the high rates of GDP per capita.

Overall, across EU countries frailty and fitness in adults aged 50+ years is strongly correlated with national economic indicators. As indicated on Fig. 2 below, in higher-income countries/regions, not only is the prevalence of frailty lower, but frail people also live longer (Theou et al., 2013).

Table 2. Main demographic and macroeconomic data, NATIONAL

	EU MEMBER STATE/NATIONAL LEVEL				
	France	Italy	Poland	Spain	UK
Demography (2014)					
Population (million)	65,83	60,79	38,02	46,51	64,31
Working age population (15-64) as % of total population	63%	65%	70%	67%	65%
Elderly population (65 and over) as % of total population	18%	21%	15%	18%	18%
Very elderly population (80 and over) as % of total population	6%	6%	4%	6%	5%
Very elderly population (80 and over) as % of elderly population	32%	30%	26%	31%	27%
Very elderly population (80 and over) as % of working age population	9%	10%	6%	9%	7%
Life expectancy at birth (years) (2013)					
men	79	80,3	73	80,2	79,2
women	85,6	85,2	81,2	86,1	82,9
Life expectancy at 65 (years)					
men	19,3	18,9	15,5	19,2	18,6
women	23,6	22,6	19,9	23,4	20,9
Dependency ratios (source EC the Economic Policy Committee³)					
Share of older population (55-64) (a)	19.8	19.2	20.3	17.1	17.5
Old-age dependency ratio (b)	28	33	21	27	27
Total dependency ratio (c)	57	54	42	50	54
Total economic dependency ratio (d)	144	173	132	172	112
Economic old-age dependency ratio (15-64) (e)	43	57	33	48	35
Economic old-age dependency ratio (15-74) (f)	42	56	32	48	34

3. http://ec.europa.eu/economy_finance/publications/european_economy/2015/pdf/ee3_en.pdf

(a) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(b) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(c) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(d) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(e) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(f) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

Fig. 1. Self-referred Unmet Medical Needs

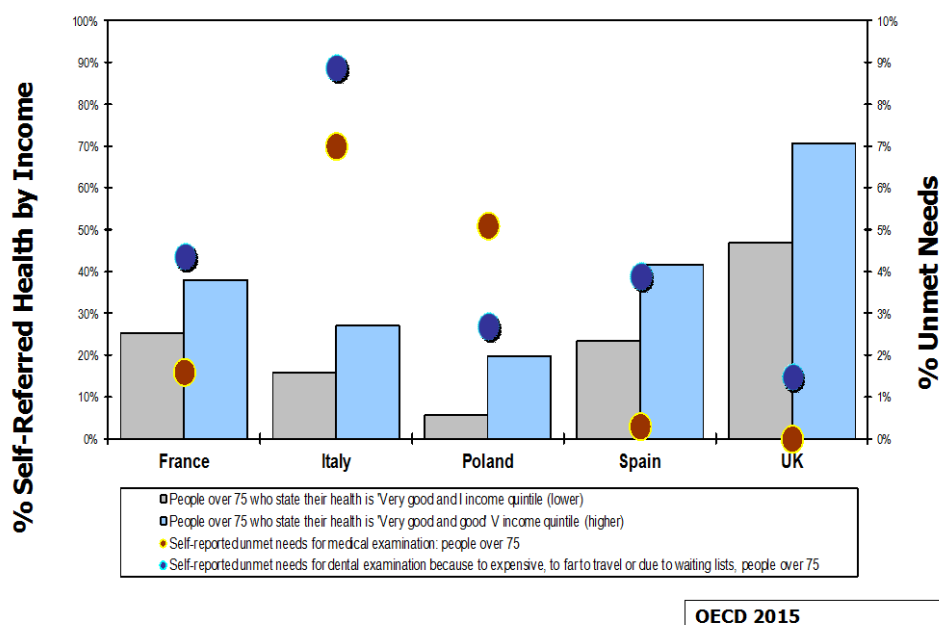
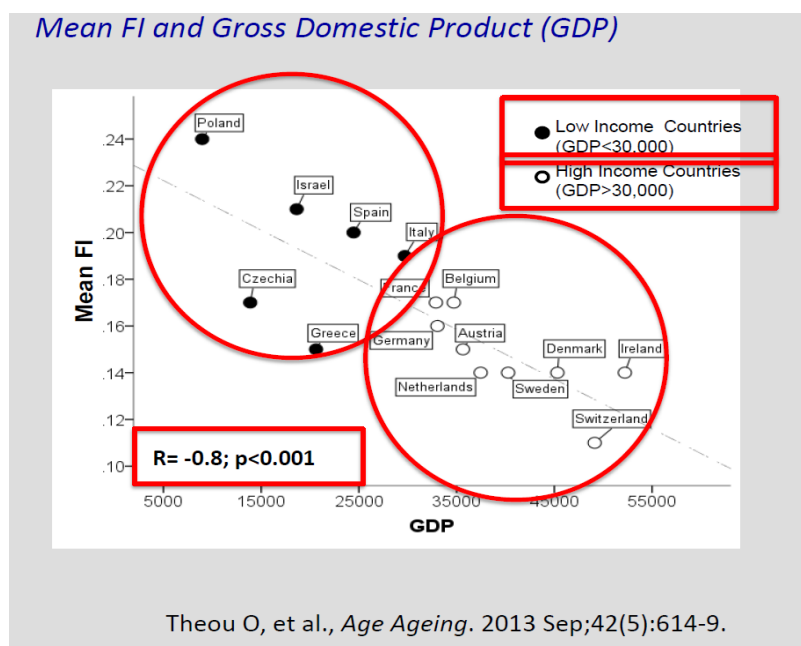


Fig. 2. Frailty (FI) & GDP across EU



Overall, the indicators summarized above highlight a picture in which Reference Sites of European Regions are differently challenged by the ageing population, in terms of population trends, equity and sustainability of health and social services.

In order to tailor services focussing on frailty within a comprehensive approach fitting with the bio-psycho social paradigm, and taking advantage of innovations, it will be important to take into consideration older adults population socio-economic factors and health policies as major determinants of frailty influencing equity and access to services.

1.3 *Frailty and Multimorbidity as a challenge for the Health and Social Systems*

Information on Reference Sites national and regional policies, strategies and programmes addressing frailty and multimorbidity within the health and social care sectors are summarized in table 3 and 4 below.

Table 3. Regional Policies Addressing Frailty and Multimorbidity

Region - Reference Sites	Dimensions	Settings	Level of Implementation
Midi-Pyrénées	F+M	S	N+R
Languedoc-Roussillon	F	S	N+R
Lodz	F+M	H, P	N+R
Pais Vasco	F+M	H, P	R
Piemonte	F+M	HM,R, P, S	R
Liguria	F+M	P,S,H	R
Campania	F+M	HM, R, H, S	N
Emilia-Romagna	F+M	HM, R, P, H, S	R
Northern Ireland	F+M	P, H, S	N+R
Legenda: Dimensions: F=frailty; M=Multimorbidity; M+F=Frailty and Multimorbidity Settings: HM=home based care, R=Residential Care, H=Hospital P=Primary Care; S=Social Care; Level of Implementation: N=National; R=Regional; N+R=National+Regional			

Table 4. Regional Models, Programmes and Components Addressing Frailty and Multimorbidity

Region-Reference Sites	Settings	Aims	Dimensions	Professionals
Midi-Pyrénées	HM, P, D, M, S	P, D, M	F+M	M, GPs, PH, NU, SP, GE
Languedoc-Roussillon	P,S	P, D, M	F+M	M, SW, GE
Lodz	H	P, D	M	NA*
Pais Vasco	HM, P, H	P, D, M	M	M, GPs, NU, SP
Piemonte	HM, P	P, M	F+M	M, GPs, SP; SW
Liguria	P, S	P, M	F+M	T, GPs, NU, SP
Campania	P,S, H	P, D, M	F+M	GPs, SP, V
Emilia-Romagna	P,H,S	P, D, M	F+M	NU,GPs, SP, GE, SW
Northern Ireland	HM	P, M	F+M	PH, NU,GPs, SP, GE, SW
Legenda Settings: HM=home based care, R=Residential, P=Primary Care; S=Social Care; H=Hospital, Aims: P=Prevention, D=Detection; M=Management Dimensions: F=frailty; M=Multimorbidity; F+M=Frailty and Multimorbidity Professionals involved: M=Managers; GPs=General Practitioners; GE=geriatrician, PH=pharmacists; NU=nurses; SP=specialists; SW=social workers; V=volunteers, T=Teachers *NA=not available				

In France (Midi-Pyrénées and Languedoc-Roussillon), the regulatory framework specifically targeting the ageing population is well integrated with regional programmes specifically focussing on early detection of frailty, prevention and management within health and social services.

The detection of frailty is based on the criteria proposed by Fried et al., 2001, aimed at identifying frailty people and directing them towards hospitals and geriatric services. Several geriatric day hospitals in France have established a specific activity for the management of frail older adults, by utilizing the “Gerontopôle Frailty Screening Tool (GFST)”, validated by Haute Autorité de Santé (High health Authority) as the national tool for screening of frail older adults by health professionals. A broader approach developed by the social sector involves the assessment of pre-frailty and frailty. Social Security offices are in charge of detecting people at risk of frailty and manage them through preventive actions. In this respect, the Carsat in Languedoc-Roussillon has implemented a “concerted single window” where all partners and geriatric services work together to ensure coordination between health and social sectors. At local level, the social sector depends on the department council, municipalities with the “Centre communal d’action sociale”, pension assurance (Midi-Pyrénées), or the department councils, municipalities and retirement insurances (Carsat, in Languedoc-Roussillon).

Within the frame of the existent national laws and related budget, Italian Regions are responsible for defining the social care objectives and policies in the field of integrated social care. For some of these administrations the concept of frailty of the older adults is still understood mainly in terms of functional frailty and it is usually addressed at an advanced stage when the person already shows functional dependency and assistance needs. Thus, specific strategies are based on the management of these conditions with home based and residential care. However, during the recent years, with the population progressive ageing trend and related health and social needs, regional administrations are oriented to design strategies and plans encouraging the prevention of frailty related conditions. In Emilia Romagna Region social services are particularly involved in the early identification and management of older adult frailty conditions, in close collaboration with primary care services. The majority of Italian partners share the chronic care model for the identification and management of chronic conditions. Furthermore, Emilia Romagna Region as well as the Basque countries have developed a system for the early identification and management of chronic diseases (for avoidable hospitalization conditions), based on the population risk stratification (through administrative, health and

social services data), and management through territorial-community based services. While Basque Countries laws address both frailty and multimorbidity, specific programmes are mainly oriented to chronic diseases.

There is a wide variety of approaches between Italian regions regarding health and social services targeting the older population, that also depends on pro-capita spending available to each region, as well as on the different activities implemented by municipalities (within the same region). Addressing sustainability issues and existing gaps, through exchange of good practices on services provision and informal care, on human resources development programmes and the large scale use of ICT-supported approaches, would contribute to standardize Italian regions strategies, contributing to ensure health equity to their citizens.

In Poland older adults are not considered a special group. Permanent allowance is provided only to older persons in special need (poverty, disability, long-term or severe disease). Some activities for older persons are carried out directly by the NGO sector: supporting intergenerational integration between older adults and youths aims at strengthening their role in the local society by using the different potentials of these two age groups.

Of particular relevance the Northern Ireland specific focus on the principles of independence, participation, care and dignity, and the direct involvement of older adults through specific advisory groups (Northern Ireland Commissioner for Older people), and R. Liguria preventive activities for physical and cognitive frailty involving education and social sector through municipality. In Northern Ireland, as well as in Midi-Pyrénées, Pharmacists are actively involved as professionals within primary care settings, and provide an example of how territory pharmacies can integrate service provision to community settings, especially in internal areas.

For further details on Reference sites national and regional health and social systems see the full report on the following link: <https://issuu.com/sunfrail/docs/healthandsocialsystems.20.11.2016.fi>

2. ASSESSMENT OF PARTNERS HEALTH AND SOCIAL SERVICES

A major expected outcome of the Sunfrail project is to propose a model of care for the detection, management and treatment of frailty and multimorbidity to be applied across Europe. In order to do so, it was important to assess Reference Sites health and social care systems and services, and particularly how they address these conditions, through the resources and organizations currently in place.

To understand current health and social services and particularly to describe the primary and specialized care offered to frail and multimorbid older persons across the reference sites, the SUNFRAIL consortium developed two questionnaires for internal use.

The first questionnaire was specifically focused at exploring the coverage, basic entitlements and accessibility of older persons with frailty and multimorbidity to local care services. This questionnaire was to be completed by local public health authorities, decision makers and/or representatives at the different reference sites.

The second questionnaire was instead devoted at understanding the community outreach, diagnosis and management approaches towards frailty and multimorbidity at the reference sites. It has been completed by health and/or social professionals with direct, first-hand knowledge of the services provided to frail and multimorbid older persons.

The obtained report, responsive to deliverables of Work package 5 and directly feeding deliverables of Work packages 4 and 6, describes the results of the surveys conducted by the SUNFRAIL consortium across the involved reference sites.

2.1 *Provision of Health and Social Care Services*

The results of the questionnaires presents a major heterogeneity across the reference sites both for what concerns the coverage, basic entitlements, and accessibility to care services as well as the approaches on the identification, prevention and care of frailty and management of multimorbidity.

Across reference sites (with the only exception of France where health and social insurance is mandatory), primary care is automatically covered with universal entitlement. Several services are similarly taken in charge by public health services across reference sites with full coverage. These include: cancer screening, outpatient primary health care, acute inpatient care, transportation for health-related issues, home care (with the exception of France where cost-sharing is required), palliative care (with the exception of Poland requiring some cost-sharing), outpatient geriatric care (with the exception of Emilia Romagna and Liguria requiring cost-sharing), cognitive stimulation (except for France), and seasonal flu vaccination (with the exception of Poland).

Long-term care is mainly based on a model of cost-sharing (with the national healthcare system or private insurances) across all the reference sites.

As displayed on table 5 below, the provision of social and health services to population aged 65 and over (and related direct cost-participation), indicates that there is an important difference between RS on the provision of some specific services. Particularly, dental care and prostheses, eyeglasses/lenses, specialist-geriatric care, pharmaceuticals, psychological and cognitive support, physical and leisure activities are in most cases provided privately, with complementary insurance, or by cost sharing; thus depending greatly on beneficiary's economic status. Emilia Romagna Region and Northern Ireland provide physical activity as a prescription from the GP, hence free of charge for older adults.

Table 5 - Health & Social Services provided to population aged 65 and over and direct cost-participation

Range of social and health services provided to population aged 65 and over and direct cost-participation (main provider)	Italy				France	Northern Ireland	Poland	Spain
	Emilia Romagna	Campania	Liguria	Piemonte				
Cancer screening	FC	FC	FC	CS	FC	FC	FC	
Seasonal flu vaccinations	FC	FC	FC	FC	FC	FC	P	
Nutritional advice	FC, P	CS	FC	FC, P	CI, P, VO	FC	FC	
Nutritional supplements	FC	CS		FC, P	CS	FC	P	
Outpatient primary health care (GP and family nurses)	FC	FC	FC	FC	FC	FC	FC	
Outpatient specialist geriatric care	CS	FC	CS	FC, P	FC	FC	FC, CI	
Acute inpatient care	FC	FC	FC	FC	FC	FC	FC	
Long term care: residential (institutional) care	CS	CI	CS	CS	CS	FC	CS	
Home care	FC	FC	FC	FC	CS	FC	FC, P	
Pharmaceuticals	CS	CS	FC	CS, P	FC	FC	CS	
Clinical laboratory tests and diagnostic imaging	CS	CS	CS	FC, CS	FC	FC	FC, P	
Palliative care	FC	FC	FC	FC, VO	FC	FC	CS	
Eye glasses and/or contact lenses	P	CS	P	P	CI	FC, CS, P	CS, P	
Dental care	FC, P	FC	P	P	CS	FC, CS, P	CS, P	
Dental prostheses	FC, P	CS	P	P	CS	FC, P	CS, P	
Transportation for health related issues	FC, P, VO	FC	FC, P, VO	FC, P, VO	FC	FC, P, VO	FC, P	
Psychological support	FC, P		P		P	FC	FC	
Cognitive stimulation	FC		FC	FC, P	VO	FC	FC, CS	
Leisure/ social activation	P, VO		P, VO	CI, P	VO		P, VO	
Physical activity	FC, P, VO	P	P, VO	CI, P	P	FC, P, VO	P, VO	
Domestic work*	P		P	CS, CI, P	VO	FC, P, VO	P	
Informal care for dependent people	P		P	CS, P	VO	FC	P, VO	
Day time wardship	FC, P		FC, P	CS, P	VO		CS, P	
Transportation for social activities or social issues	P, VO	CI	P, VO	CS, P	VO	FC, P, VO	P	
Income support (living and housing)	FC, VO		VO	CS, P	VO	FC	P, VO	
Feeding (meals)**	P	FC	VO	CS, P, VO	VO	FC, P, VO	P, VO	

* These services refer to home based support to elders living alone (housekeeping, cooking, shopping) (not for dependent or disabled people).

** Community support to elders living alone (community canteens, soup kitchen) (not for dependent or disabled people).

FC: Fully covered by NHS or main insurer; **CS:** NHS or main insurer with cost-sharing; **CI:** Voluntary, complementary insurance; **P:** Private, out-of-pocket; **VO:** 3rd sector, voluntary organizations, **NA:** Not applicable

The organization of primary care is also quite heterogeneously structured, sometimes tending towards public models (e.g., Italy, Poland), some others with characteristics of private services (e.g., France, Northern Ireland).

A great heterogeneity both in qualitative and quantitative terms is also evident for what concerns the retirement fees and exemption system for healthcare-related costs across reference sites. The minimum retirement pension is variable across Europe, with even a 4-fold difference across sites. The methods for applying exemptions to healthcare costs are also quite diverse; in some cases a maximum exemption cost is applied according to the clinical and socio-demographic profile of the individual (e.g., France), while in other regions, exemptions are applied to the offered services without specific limitations (e.g., Poland, Italy).

Individuals are always free to choose his/her primary care physician across reference sites, but never the case manager. Some limitations may be present in the choice of the specialists in the out-patient setting and of the hospital personnel.

2.2 Detection and Management of Frailty and Multimorbidity

Regional targets setting the strategies to improve health outcomes in older persons are not always present across the reference sites. Population surveys addressing health, social and economic conditions of older adults are not systematically performed in order to assess their needs. However, they seem to be consistently involved in the processes regarding the structure and organization of the services provided, through participatory approaches, involving patient's organizations, voluntary associations and others.

The detection of frailty in primary care is consistently done by reference sites, although different professionals might be in charge of this task. The frailty screening is frequently carried out by the general practitioner. In some cases nurses, social workers, and other specialists might (formally or informally) support this activity, as reported in tables 6 and 7 below.

Table 6 - Assessment of Frailty by GPs in Primary Health Care

	Italy				France	Northern Ireland	Poland	Spain
	Emilia R.	Campania	Liguria	Piemonte				
Do general practitioners in primary care practices (or centres) perform early identification of frailty?	Yes	Yes	No	Yes	Yes	Yes	No	Yes

Table 7 - Assessment of Frailty by other Professionals

	Italy				France	Northern Ireland	Poland	Spain
	Emilia R.	Campania	Liguria	Piemonte				
Are there other health / social professionals than general practitioners performing early identification of frailty in the community setting?	Yes	No	Yes	No	Yes	No	No	Yes

Reference sites report an extreme heterogeneity in the clinical assessment of the risk profile of the older person. As displayed in table 8 below, the common risk factors of frailty are not always systematically explored in primary care (in certain regions quite rarely). Moreover, differences also exist about the risk factors that are prioritized for evaluation at each reference site. *Smoking habit, history of falls, multimorbidity, and polypharmacy* are the risk conditions that are attracting more attention during the screening of older persons in primary care. The assessment of other risk factors like *physical inactivity, nutritional status, alcohol consumption, oral health and social-economic status* (that could orient directly prevention/support activities), are generally not performed.

An even greater heterogeneity is evidenced by Reference Sites reported instruments locally used for the identification of frailty in primary health care, as displayed on table 9 below. Most of the Reference Sites have no specific instrument implemented in the primary care routine.

Table 8 – Assessment of Frailty Risk Factors

Are the following risk factors for frailty systematically monitored in Primary Care? Please specify also the professional/s involved (GP, nurse, social worker, pharmacist, psychologist, others)?	Italy				France	Northern Ireland	Poland	Spain
	Emilia R.	Campania	Liguria	Piemonte				
Nutritional status	S	NR	NR	S	NR	NR	NR	NR
Physical activity	S	S	NR	NR	NR	NR	NR	S
Smoking habit	S	S	NR	S	S	S	NR	S
Alcohol consumption	S	S	NR	NR	NR	S	NR	S
Oral health	S	S	NR	NR	NR	NR	NR	NR
Mood	S	S	NR	NR	S	S	NR	NR
Life events*	S	S	NR	NR	NR	NR	NR	NR
History of falls	S	S	NR	S	S	S	NR	NR
Concurrence of 3 or more chronic conditions	S	S	NR	S	S	S	NR	S
Social status (e.g., isolation)	S	S	NR	NR	S	S	NR	NR
Polypharmacy: 5 or more drugs taken on a regular basis	S	S	NR	S	NR	S	NR	S
Economic status (e.g., constraints)	S	S	NR	S	NR	NR	NR	NR
Educational level	S	S	NR	NR	NR		NR	NR

*incl.: death or serious illness of a loved one, divorce or end of an important relationship, traffic accident, crime (Gobbens et al., 2010)

S: systematically, NR: never or rarely

When instruments are available/recommended by local public health authorities, it is unlikely to find the recommendation of a single tool; it is more likely to have multiple instruments proposed (or also endorsed) by public health authorities as suitable for the task, leaving to the healthcare professional the choice of the most convenient one to use. This contributes to a great heterogeneity in the indicators that are monitored in the different context. Moreover, the lack of systematic collection of monitoring data into shared databases further hinders the implementation of timely interventions.

Table 9 - Instruments to Assess Frailty in Primary Health Care

	Italy				France	Northern Ireland	Poland	Spain
	Emilia Romagna	Campania	Liguria	Piemonte				
Is there a validated questionnaire or instrument used to assess frailty in primary care?	TFI, P7, E, GS	Other	FPh, FRAIL, GS	No	GFST	No	No	No

TFI: Tilburg Frailty Indicator; P7: PRISMA-7; E: Edmonton Frailty Scale; GS: Gait speed; FPh: Frailty phenotype by Fried and colleagues; FRAIL: FRAIL tool by Morley and colleagues; GFST: Gèrontopôle Frailty Screening Tool

Among the preventive interventions in place to counteract the disabling cascade, those that are more frequently provided by institutional health or social sector are: *transportation for health-related issues, psychological support, cognitive stimulation programs, and income support (for living and housing)*. Differently, *leisure/social activation programs, adapted physical activity programs, transportation for social activities and social services, and feeding (community canteens, soup kitchens)* are the most common coordinated by community initiatives, although they may not be prioritized according to the assessment of risk factors. *Meals at home, monitoring at distance, and housekeeping help* are also quite common across reference sites, but their organization (institutional versus community) is variable.

The evaluation of the older persons through a multidisciplinary team adopting the comprehensive geriatric assessment is not always present at the reference sites, with the exception of some Italian regions and France.

Once frailty is detected, the modality of intervention is quite homogeneous across reference sites. It consists of 1) diagnostic examinations and clinical evaluation, 2) management of multimorbidity and polypharmacy, and 3) design of a personalised plan aimed at preventing functional loss. Specific preventive activities might also be proposed according to the locally available services and resources. Usually, continuity of care is guaranteed by a discharge letter sent to general practitioner or case manager. In some systems, real time communication through telemonitoring also supports the communication among health professionals and the patient's follow-up, showing effectiveness and potential to be scaled up across reference sites.

Although programs based on the case-manager model are largely diffused across Reference Sites (with the only exception of Poland), there is no standardized procedure for managing hospital admissions and hospitalizations of frail older patients. Also, the use of tools for measuring frailty in the hospital setting is quite inconsistent and relatively rare. However, there is the tendency at having a good network for guaranteeing a safe discharge of the patient from the hospital to the territory across Reference Sites (only Poland and Spain have no formal organization for supporting this phase), although there is broad margin of improvement by scaling up ICT-supported protected discharge. The availability of systems for the protected discharge of the patients might be related to the frequent problem of the "bed-blocking", due to the limited availability of home care and long term services, and inadequate adoption of ICT-supported monitoring systems. This might be the cause for which the integration between the hospital and the primary health care is still inadequate.

2.3 Conclusions

Overall, with the survey performed the SUNFRAIL project has highlighted a major heterogeneity in the primary care and clinical services and models aimed at counteracting frailty and multimorbidity in the elderly, and at the same time pointed out the richness of some innovative approaches. Given the relevance of the topic (especially in our ageing societies), it is important to build up on the commonalities to address the identified gaps to standardize prevention, identification and management of frailty and multimorbidity across Europe, contributing to equity and sustainability. Although it may be challenging to federate such existing diversities in a single and rigid model of care, Sunfrail approach will try to identify a core set of activities that can flexibly implemented across the different loco regional contexts.

The definition of a too detailed model, not respectful of regional differences, could create a theoretical work facing huge difficulties when implemented in specific settings. Differently, the provision of a general structure taking advantage of the few common areas might be more practical and feasible. In this context, the few points to be carefully retained and on which the model should be founded are described as follows:

- Frailty and multimorbidity are relevant conditions, considered everywhere across Europe;
- Only few risk factors for disabling conditions are systematically screened in primary care across Europe, showing that the existing approach is largely inadequate (under both quantitative and qualitative perspectives);
- No instrument can today be indicated as "gold standard" for the screening and assessment of frailty;
- The general practitioner can be considered as one of the main entry point and referral of the primary health and social care services for the detection of frailty and the implementation of the first interventions, although for some RS other professionals (e.g. nurses, social workers), play an important and complementary role;
- There is broad margin to integrate innovative approaches in the prevention of frailty.

At the same time, it cannot be ignored the burden of clinical activities conducted in primary care, with both preventive and therapeutic objectives. In order to implement a solid preventive strategy, it is thus needed to delegate some tasks to actors who are not adequately involved in the current systems and models tackling frailty, strengthening their capacity to take advantage of innovative tools. Among these, the person him/herself, the family, the social workers and community nurses may strongly contribute to design, implement and scale-up a successful model of care by following adequate training.

For further details on Reference Sites Health and Social Services see the complete report on the following link: https://issuu.com/sunfrail/docs/d5.2_reportonrsservicesdelivery22.1.

3. ASSESSMENT OF GOOD PRACTICES ON FRAILTY AND MULTIMORBIDITY: ELEMENTS FOR INNOVATION

3.1 Methodology

In order to assess Reference Sites Good Practices (Gps) on the identification, prevention and care of frailty and multimorbidity, the Sunfrail project has developed specific criteria. The template was sent to all Sunfrail partners to allow data/information collection.

It was composed of two sets of criteria. The first one included 3 mandatory inclusion criteria, aimed to assess:

- Gps on frailty (including those at risk of frailty) or multimorbid persons (65+);
- the innovative approach (multidisciplinary, new methodology or tool, integrated care, ICT...);
- the duration (started at least 1 year ago and still ongoing).
- If the practice fulfilled these 3 criteria, a second table with additional criteria was to be filled in (objectives, evaluation, stakeholders, law, deliverables, transferability, participation, publication, difficulties).

3.2 Results

A total number of 33 Gps were collected from Sunfrail Reference Sites, respectively:

- Basque Country (DEUSTO), Spain: 3
- Macvia (CHU/ Carsat / Toulouse), France: 13
- Northern Ireland: 6
- University of Łódź, Poland: 2
- RER ASSR: 3
- Campania: 2
- Piemonte: 1
- Liguria: 2

Most of the Gps involved multi domain approaches and multidisciplinary stakeholders.

All Gps include multiple stakeholders, ranging from specialized institution, regional institution, universities, governmental institutions, health and social public and private institutions, independent professionals, medical professionals, researchers and associations (non-profit organization).

Topics cover the following fields: medical research and care of multimorbidity, assessment of cluster of multimorbidity, chronic respiratory diseases, low back pain, ICT tools, specialized housing equipment for fall prevention, appropriate prescription, dementia, training & education, social health, risks of frailty prevention, workshops, health system improvement in terms of cost effectiveness, and reduced hospitalization.

3.3 *Conclusions*

Although the Gps collected target frail or multimorbid people, they show disparities in terms of details provided, on the methodology of implementation, the scaling up, the follow-up process and the population targeted; that is probably due to a difficult interpretation of the form provided.

Some Gps are related to the care of dependent people, such as home based care and care of people with dementia. As they are falling beyond Sunfrail scope, they were not analysed.

For this reasons, based on the EC suggestions, the Sunfrail project decided to apply the Joint Action Chrodis criteria (28 items) to one of the Sunfrail good practice, MASK.

A Survey Monkey was sent to 34 experts from different fields to validate the correspondence between the Chrodis criteria and the given information of MASK. For each 28 items, respondents indicated their level of agreement on a VAS ranging from 0 (strongly disagree) to 100 (strongly agree). 17 experts from 12 countries responded (50.0%). Five SUNFRAIL experts were included in the survey. All the items could be filled in, as MASK is a mature practice already scaled-up. Results indicate this Good Practice is in line with the CHRODIS recommendations.

However, this process is rather long and doesn't seem applicable for a heterogeneous group of Gps showing diverse implementation scales (target, cost effectiveness...).

During the Brussels steering committee, March 2017, it also has been suggested to each partner to upload their GP on the EC EIP on AHA Repository of Practices (4 sections for a total of 26 items).

In conclusion, the developed Sunfrail 12 items questionnaire was appropriate to gather and share all Sunfrail Gps between partners, no matter the diversity of their profile, in a simple and accessible way.

The overall variety of the Gps shared by the Sunfrail Reference Sites partners shows the wealth of experiences held in the field of frailty and multimorbidity.

Some Gps are focussing on risk stratification strategies based on big data connecting health, social and administrative services: Macvia Frailty Observatory and CSW (Carsat); Risk ER (RER); PIP (Deusto); Risk Stratification (HSCB Northern Ireland). Other Gps are on ICT supporting Tools (Persilaa, eCare network RER, others), thus enabling the wider deployment of ICT based tools for the early detection of frailty.

For further details on the methodology, tools and results see the full reports on the following link: https://issuu.com/sunfrail/docs/wp4.2.1_rs_gp_synthesis_15.11.16

4. PATIENT'S/CITIZENS PERCEPTIONS AND EXPECTATIONS ON FRAILTY AND MULTIMORBIDITY AND ACCESS TO CARE

Understanding patient's/beneficiaries perception and expectations on frailty and multi-morbidity is essential to ensure that the Sunfrail Model will fit the purpose to contribute to adapt services responding to their needs/expectations.

An assessment of the studies conducted in this field was made in order to collect base line information on which building the Sunfrail model for the identification, prevention and management of frailty and care of multi-morbidity. Different studies/reports were analysed, such as the EIP AHA initiatives on patient and beneficiaries (CPME and MISTRAL), as well as the assignments conducted by partners. Information on patient's/beneficiaries was also collected directly from EIP AHA A3 Action Group through a Monkey Survey.

The report elaborated for the Sunfrail project analyses the results of several documents on this topic, and highlights those of particular relevance to enhance the understanding of patient's/final beneficiaries viewpoints, thus to tailor services addressing their needs. Analysing the perception of patient's/beneficiaries about the concept of frailty and multimorbidity and on the obstacles to care, contributes to identify the existing gaps between perceived need of care and responsiveness of existent services in different loco-regional contexts. The results of the assessment are also important in order to support the project experimental phase.

For further details see the full report on the following link:

https://issuu.com/sunfrail/docs/d5.1_report_on_patients_sunfrail_fi

4.1 *Patients and beneficiaries' perception on frailty and multimorbidity*

The Sunfrail project analysed a number of studies to obtain an insight on patient/final beneficiaries' perception of frailty and multimorbidity (CPME's, Gerontopole's, Age UK/BGS studies).

In particular, the qualitative Age UK/BGS study provided some useful responses on the concept of "frailty". It also examined the attitudes toward prevention and management of frailty, in terms of accessing care and services from the different perspectives of the older people, of non-health care practitioners (HCPs) and of informal carers.

One of the most interesting aspects is that patients and beneficiaries did not identify themselves with the term "**frail**", and also showed a strong aversion to it, as in common understanding it refers to a total **loss of independence**; an irreversible state that some older people face by entering into in the very final stages of their lives.

Older people were acutely aware of their own position on the '**independence scale**', indicating a reduced ability to complete tasks independently.

However their understanding and awareness of risk factors associated with clinical definitions of frailty tended to be low. Whereas some risk factors were recognised (e.g. chronic illness, recovering from acute illness or surgeries and poor diet), others, such as being overweight and having unhealthy lifestyle choices were generally unrecognised.

Interestingly non-specialists HCPs and carers were attuned to the fact that having an independent lifestyle is the biggest motivator for older people in terms of taking action to safeguard their health and wellbeing. In line with older people themselves, this group also preferred to articulate an older person's wellbeing in terms of their '**functionality**', measured by the extent to which everyday tasks can be completed independently.

4.2 *Patient and beneficiaries' expectations of and barriers to services*

On experiencing the clinical symptoms of frailty, older adults would not automatically look for external sources of support, and particularly not from General Practitioners (GPs), as they believe that doctors should not be 'bothered' with non-clinical conditions. Consequently, when noticing a reduction in their capabilities, their first instinct would be to look for their own solutions/self-identified coping mechanisms rather than external sources of support. They perceive the need of support as being synonymous with a total loss of independence and of free choice; thus to be avoided for as long as possible.

Therefore, it is important to bridging the gap between services provision and utilization, by considering beneficiaries need for independent life, and working on their awareness of risk factors and on preventive activities and services available, involving families, associations, circles, pharmacies. At the same time it is necessary to work with professional's knowledge of frailty, team work approach, and services integration.

4.3 *Suggested areas for Focus*

Encourage elderly to engage with preventive activities and services on frailty through the following:

1. Build on existing beliefs that 'living with frailty' is not an inevitable or irreversible part of getting older; it is possible to maintain independence by engaging with strategies and services;
2. Build on existing awareness on the risk factors for frailty, and raise awareness of lesser-known risk factors such as being overweight;
3. Provide a comprehensive overview of services and solutions that are available and how to access them, particularly the less invasive, smaller scale services that demonstrate that getting 'support' doesn't mean going into a care home;
4. Support promotion and prevention activities,
5. Strengthening the adoption of ICT-supported instruments, and strengthen health and ICT literacy;
6. Improve data collection and sharing through interoperable solutions;
7. Raise awareness of regular Comprehensive Geriatric Assessment (CGA) and clarify the value that it offers;
8. Encourage older people to talk to their formal and informal carers and to enquire about services to which they are entitled;
9. Require carers to engage older people on the topic, using an adequate language.

5. HUMAN RESOURCES NEEDS AND DEVELOPMENT ON FRAILTY AND MULTIMORBIDITY

According to the British Society of Geriatricians, a failure to provide healthcare staff with appropriate skills and training to meet the complexity of frailty in older people needs is one of the key factors contributing to the failure of the care of older adults. Therefore ensuring an appropriate, trained and sustainable workforce is clearly a major issue.

For these reasons, Sunfrail WP 7 aimed to elaborate an innovative academic educational programme addressed to healthcare professionals, with the purpose of filling the existing gaps between the available standard training programmes in the partner countries and educational programmes focusing on the needs of the increasing ageing population. Specifically, the innovative programme would help in training healthcare staff with a strong focus in preventing, identifying and managing frailty and multimorbidity in the population.

5.1 *Literature review*

As first step, Sunfrail WP4 and WP7 have worked simultaneously, by performing a literature analysis on the framework of some basic research questions, to support the subsequent design of an innovative model for the identification, prevention, care and management of frailty and multimorbidity. Objective of these tasks was to explore the concepts of frailty and multimorbidity and to find experiences and good practices about dedicated services, at the same time assessing training and education of health and social care workforce on the same concepts.

5.2 *Assessment of models, programmes and approaches used to cope with frailty and/or multimorbidity within the professional and academic education system*

Information on models, programmes and approaches used to cope with frailty and/or multimorbidity within the professional and academic education systems were also analysed as part of the assessment of Reference Sites' Health and Social Systems. Reference Sites like Languedoc Rousillon, Piemonte and Campania have long lasting specific programmes for professionals addressing frailty and multimorbidity. For other partners, specific programmes are normally part of EU funded projects. Of particular interest is Piemonte programme on community based detection and management of frailty through the work of specifically trained nurses.

As the results from these phases of work were not fulfilling entirely the needs, WP7 members decided to collect some more information. Specific questionnaires on human resources training needs were provided to partners, to collect information that were relevant to design the tools for professional improvement regarding the identification, prevention and management of frailty and multimorbidity. WP7 also provided stakeholders of the EIP-AHA with questionnaires concerning such an overview.

5.3 Results

The available literature concerning the concepts of frailty and multimorbidity and their management for the medical training, mostly regards the geriatrics medical specialty. Some physicians working in hospital wards reported a need for a deeper knowledge of geriatric care and geriatric concepts, as a greater awareness and knowledge of geriatrics issues are vital for physicians in most specialties. Moreover, the concept of frailty is commonly intended as referring to an acquired pathological status (population affected by at least one condition). Geriatric academic curricula extensively deal with akin concepts and do specialize in the care of older adults, but are very 'institution/hospital/residentially' oriented. Community dwelling citizens, 65 years and older, apparently are not specifically the final target of academic medical programmes, or only partially. The concept of 'care and cure' of conditions preceded by a status of frailty is mostly addressed, rather than the concepts of 'prevention' and health status preservation.

Again, the concept of frailty is usually not univocal but, according to the different health and social care professionals, it can cover different meanings. After the intensive work carried out so far by the European Innovation Partnership on Active and Healthy Ageing (EIP-AHA, 2012 - to date), the concept of frailty has been thoroughly discussed, and an agreement on a more comprehensive meaning has been reached. The concept of frailty, in an age range of the population starting from about 65 years, includes several different domains, and not only the biomedical/clinical one. The social, psychological, environmental and economic domains have been included in the analysis of the 'frailty syndrome' at European level.

As far as the nursing profession is concerned, formal training and education programmes start to include the issues of frailty detection and, possibly, prevention strategies. Family and community nursing academic programmes have been developed in some European countries (Italy, Spain, UK), where the role of the nursing staff is crucial for the development of a direct, confidential and trustworthy relationship with the community dwelling citizens aged 65 and over.

5.4 Tools for the Improvement of Professional Performance

One of the most evidence-based and shared views among health and social care professionals is the possibility of planning an interdisciplinary kind of education across professional specialties, where different health and social care roles could attend common classes and training activities. That's what the final goal of Sunfrail's Work Package 7 is about. A 'practical' tool such as a short educational programme, developing the concepts of frailty detection, management and, possibly, the related prevention strategy, is being elaborated. Multimorbidity is addressed particularly by the pharmacy professionals, together with MDs and all other professionals involved, in order to manage polytherapy, to prevent the risk of inappropriate prescribing and to actively involve citizens/patients in a more empowering self management. The tool will be tested and assessed by the 'real' professionals; thereafter it will be peer-evaluated and validated by Sunfrail project partners and experts.

6. IDENTIFIED AREAS FOR IMPROVEMENT

- Strengthen the early identification of frailty through its main risk factors and addressing its bio-psycho social domains;
- Harmonize the tools for the early identification of frailty at primary care (health and social services) and community-based level, as a first entry gate and contact point between patients /beneficiaries formal and informal services;
- Broaden the use of interventions taking advantage of innovative tools to prevent frailty;
- Support the establishment and functioning of multidisciplinary teams with approaches linking primary and community care for the early identification of frailty with secondary care for referral for further clinical and diagnostic investigations;
- Train professionals and carers on the need of a multidisciplinary approach to frailty and empowering them to the use of innovative approaches;
- Support the delivery of activities on preventing frailty and multimorbidity linked to the assessment of their risk factors, and integrating ICT tools;
- Identification of contextual barriers (sociocultural, economic, organizational etc.) to the provision of adequate and integrated services to older adults;
- Increase health and ICT literacy among older adults to improve self assessment and early identification of frailty, to allow sustainable interventions and reduce progression to dependency;
- Engage patients and beneficiaries in the development of educational and promotional messages on the need to be involved in preventing frailty, multimorbidity and disability for active and healthy ageing;
- Work with key decision makers, providing evidences on barriers to care regarding frailty and multimorbidity, with a focus on the sustainability and equity of early and innovative interventions to prevent and manage frailty.

7. THE PROPOSAL

An operational model for the identification, prevention and management of frailty and multimorbidity in community dwelling settings

7.1 Sunfrail Conceptual Frame

Sunfrail Reference Sites health and social systems and services show a variety of strategies and approaches to frailty and multimorbidity. In some cases they are more oriented toward the management of frailty and disability, through hospital, home based and residential care, while in others are more devoted to community-based health and social care focussing on prevention. Overall, a systematic assessment of frailty risk factors is missing, as well the availability of specific tools for its early identification and large scale use of ICT-supported interventions.

Furthermore, there is an important difference between RS on the provision of specific services and related cost recovery rules (e.g.: for dental care, eyeglasses, specialist geriatric care, pharmaceutical prescriptions, physical activity, psychological, cognitive, leisure), indicating an equity issue influencing access to services that is depending on welfare systems and beneficiaries economic situation.

Considering the bio-psycho social domains of frailty and the importance of responding to patients/beneficiaries needs to maintain independence, a first priority is to work on the assessment of frailty risk factors and its prevention.

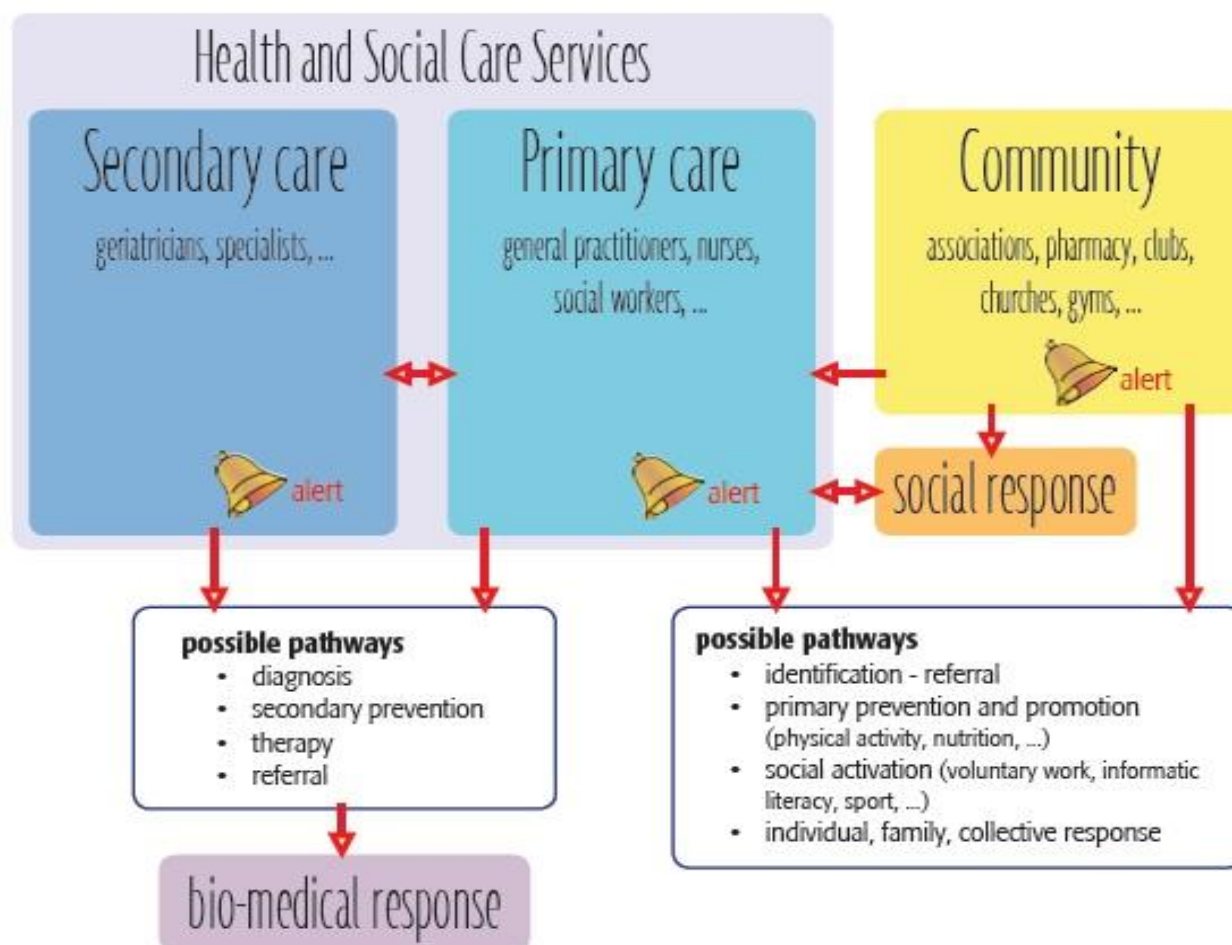
As indicated in the Sunfrail Tool conceptual frame below (fig.3), this can be done through a “multiple entry door system”, where frailty and its risk factors can be identified through health, social and community-informal system. Professionals and carers opportunely trained may identify frailty and its risks, and activate an initial “alert” for further prevention activities, professional/specialist and diagnostic investigation.

At the same time, the identification of risks related to the socio-economic domains can activate a specific response within these specific settings (community-social). In order to work on early identification and prevention, pathways of identification and care need to be structured also considering the perception and acceptability by patients and beneficiaries.

In order to gather this view it is important to work on the development of specific tools, educational and promotional messages toward preventing frailty, multimorbidity and disability. We need to take into consideration beneficiaries perception of frailty versus independence, and how this influences their health seeking behaviour and preventive attitudes that may be driven also by cultural and socio-economic barriers. Professionals and carers should be trained and oriented to consider these aspects, and toward a multidisciplinary approach to frailty.

To ensure that a system approach is deployed at scale, it is also important to provide evidences to policy makers about the barriers to care regarding frailty and multimorbidity prevention and management, especially considering equity and sustainability of early innovative interventions.

Fig. 3 – Sunfrail Tool Conceptual Frame



7.2 The Reference Sites Experimentation on Frailty and multimorbidity

7.2.1 The Sunfrail Tool and Other Tools

As foreseen by the project WP4, within the assessment of Reference Sites health and social services, Sunfrail project carried out the assessment of the instruments used to identify frailty and multimorbidity in Primary Health Care.

Reference Sites report an extreme heterogeneity in the clinical assessment of the risk profile of the older adult, as the most common risk factors of frailty are not systematically explored (in certain regions quite rarely), and are prioritized differently.

Moreover, the Reference Sites have no specific instrument implemented in the primary care routine. It is more likely to have multiple instruments proposed (or also endorsed) by public health authorities, leaving to the healthcare professionals the choice of the most convenient one to use. Available instruments are rather focusing on the identification of frailty than on the detection of its risks; leaving narrow margins for innovative interventions.

Taking into consideration all these aspects, a Sunfrail team composed by geriatricians, public health experts, sociologists and other professionals have developed a tool for the early identification of frailty and multimorbidity within primary care and community settings: the Sunfrail Tool (see Fig. 4 below).

The tool, far from being exhaustive, encourages health, social and community carers to identify the risk of frailty through a "minimum core of items" within the biomedical, psychological, individual and socio-economic domains, and to generate a response.

It is a first "easy to use" screening tool, usable by different professionals and also by informal carers within health, social and community settings, allowing the generation of a first alert that would then imply a) the activation of a referral for further medical assessment and diagnostic investigation or b) activation of a proactive response from the social sector and the community.

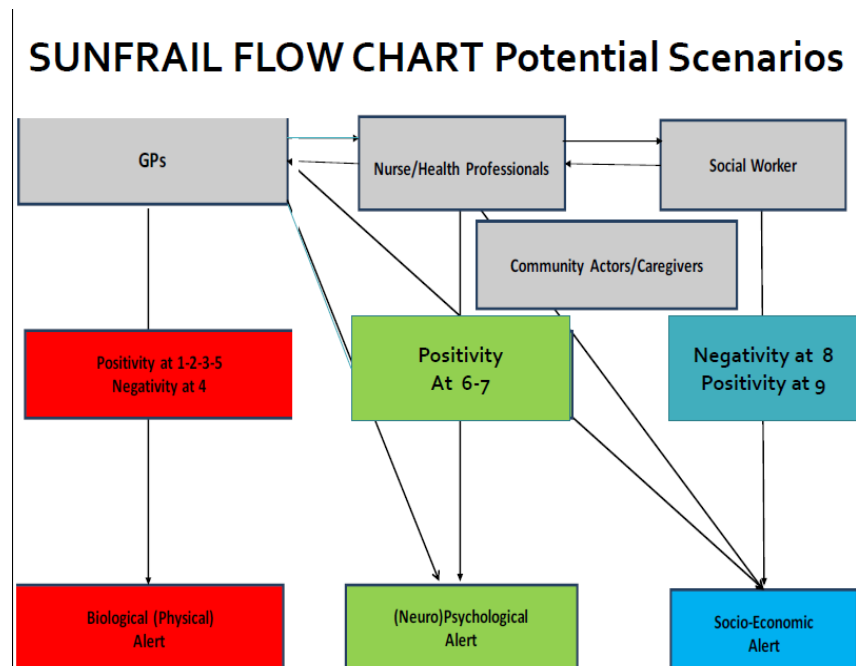
Fig. 4 – Sunfrail Tool for the Early Identification of Frailty and Multimorbidity

*Domain: **B** = Biological **P** = Psychological **S** = Social*

1. **Do you regularly take 5 or more medications per day B**
2. **Have you recently lost weight such that your clothing has become looser? **B****
3. **Your physical state made you walking less during the last year ? **B****
4. **Have you been evaluated by your GP during the past year? **B****
5. **Have you fallen 1 or more times during the last year? **B****
6. **Have you experienced memory decline during the last year? **P****
7. **Do you feel lonely most of the time? S**
8. **In case of need, can you count on someone close to you? S**
9. **Have you had any economic difficulties in facing dental care and health care costs during the last year? S**

By using the Sunfrail tool and the flow chart (Fig. 5 below), each partner is supposed to identify beneficiaries risk and to suggest/activate responses based on the pathways already existing within its own setting; thus to make use and to strengthen primary care and community services, or in alternative to point out the needs for improvements.

Fig. 5 – Sunfrail Tool Flow Chart



For further details on the Sunfrail Tool, see the specific deliverable (D 6.2 Report on the Tools to Predict and Manage Frailty and Multimorbidity).

The aim of the Sunfrail project is to build a model that can show common aspects, differences and needs for improvement existing between partner's health and social systems, services and instruments, and to display the added value of each of these through the results of the experimental phase.

Sunfrail model will summarize all these different approaches, that each partner will contribute to enrich with its own specificity, and at the same time will gain from sharing common instruments (and related results), eventually adopting other partners good practices.

Particularly, the experimentation of the Sunfrail model will be enriched through the testing of Reference Sites specific tools and good practices for the identification of frailty and multimorbidity.

7.2.2 Reference Sites Strategies and Good Practices on Frailty and Multimorbidity

The assessment of Sunfrail good practices (Gps) on frailty and multimorbidity indicated Reference Sites great variety of strategies and approaches. Some RS were focussing specifically on Population Risk Stratification, management strategies and actions: Macvia Frailty Observatory and CSW (Carsat); Risk ER (RER); PIP (Deusto) and Risk Stratification (HSCB Northern Ireland); although related services often give priority on the management of people at very high and high risk of hospitalization, thus with an higher probability of identifying individuals having already some forms of disability.

Some good practices were also related to early identification and prevention of Falls (RER, Northern Ireland and Macvia), and of physical and cognitive decline; thus taking into consideration a population with lower risk profile. Other good practices were focussing on home and residential care; with a disease oriented approach (Acute Care At Home-Northern Ireland; Maia-Macvia).

On the organizational aspects, identified good practices were also on ICT supporting Tools (Perssilaa, eCare network RER, others) and on professionals Training and Education needs (Macvia, Piemonte).

Overall, in attempting to include the suggested Gps within a chronic care model, it would appear that the majority of these are mainly used for the identification and management of high and very high risks conditions, with a consequent higher burden on health care services and related costs. The application of the Sunfrail tool complements these approaches, by allowing early identification of frailty in the population with medium-low risk, to orient a proactive strategies and actions based on prevention.

7.3 *Aims of the Experimentation*

7.3.1 *Testing the Sunfrail model on frailty and multimorbidity*

The project experimented the Sunfrail Model on Frailty and Multimorbidity, by conducting a further assessment of some Gps and assessing how the Sunfrail tool can support the early identification of frailty and multimorbidity in different settings, in order to avoid hospitalization and disability. It is from the complementarity of these strategies and approaches that the Model provided suggestions to improve the identification, prevention and management of frailty and care of multimorbidity in existent health systems and services of EU countries.

The results showed how the Sunfrail conceptual frame and tools can be adopted in different organizational settings (community, primary health and social care, secondary care-outpatients), and whether there is a need for improvement in services and existent pathways. It provided recommendation for the future applicability and replicability of the model, good practices and tools in other European settings.

7.3.2 *Further assessment of Sunfrail Good Practices*

The Sunfrail project performed a further appraisal of identified good practices (e.g.: Risk-ER), to measure how they could fit and enrich the designed model of care.

RER-ASSR has developed an innovative population-based model using longitudinal administrative databases (health and social care), that identifies the risk of hospitalization and frailty for the resident adult population. Its objectives for the experimentation are (i) to apply a predictive model to identify patients at high risk of hospitalization and frailty; (ii) to create 'patient risk profiles' that provide information about high-risk patients to the general practitioners (GPs) and nurses in the Case della Salute (Community Health Centers-CHC); (iii) to assess the extent to which this model provide additional information useful for the identification of patients who may benefit for case management or disease management purposes and interventions taking advantage of innovative approaches; and (iv) to assess the quality of the health care provided through monitoring on professionals and patients experiences regarding services (PACIC and ACIC).

7.3.3 Testing the Sunfrail tool in different EU Settings

The consortium elaborated a protocol to test the Sunfrail tool in participating Reference Sites. The objective was to verify its adaptability, usability and adoption into the current professional practice. It included the following phases:

1. Translation and back translation of the tool into all languages spoken in the participating sites;
2. Verify the understanding/comprehension of the tool by beneficiaries and professionals;
3. Verify the applicability of the tool into the current professional practice
4. Analysis of results
5. Assessment of professional's opinion on the applicability and transferability of the Tool

Based on the results of phase 1 and phase 2 the Sunfrail tool was finalized in all languages spoken in the participating sites.

Five partners across the Reference Sites (HSCB, R. Liguria, Federico II of Regione Campania, University of Lodz, Deusto), tested the applicability of the Sunfrail Tool into the current professional practice (phase 3), with the aim to provide information on its replicability and transferability across Europe.

Reference Sites have selected different experimentation settings based on their organizational structure. In some cases the administration of the tool has occurred within community and primary care settings, while based on specific organizational set-up; other RS have administered the tool within secondary care settings (outpatients departments). The tool was administered by professionals and community actors. Target beneficiaries were community-dwelling older subjects not institutionalized and not presenting physical and mental disability. Reference Sites testing the Sunfrail tool at secondary level facilities have confirmed the responses obtained from some items of the questionnaire with specific confirmatory tests.

WP7 developed and tested also a multiprofessional short training programme (Sunfrail Tool HR), aimed at enabling the application of the Sunfrail tool by social and health care professionals (GPs, geriatricians, psychologists, nurses, physiotherapists, social workers, pharmacists and administrative staff), with a multidisciplinary and intersectoral approach.

Through the EU **CoSENSo project** (COmmunity Nurse Supporting Elderly iN a changing Society-<http://www.alpine-space.eu/projects/consenso/en/home>), the Sunfrail tools have been also adopted in other EU countries/Regions (France, Slovenia, Austria); particularly in primary care and community based settings.

The adaptability and usability of the Sunfrail tool was also assessed through an analysis of the data collected with the definitive version of the Carsat questionnaire (Macvia RS tool: the Carsat-LR AHA grid), which includes 8 out of the 9 questions defined by the SUNFRAIL project. The tool is a good practice identified with the Sunfrail project.

The Campania Region, Azienda Ospedaliera Universitaria “Federico II”, conducted a pilot study on the Sunfrail tool in the Geriatric Evaluation Unit (secondary care services). Its objective were to determine the associations between the Sunfrail tool and the Italian version of the Frailty index (IFi), a modified version of Rockwood’s clinical frailty index (Rockwood K et al., 2005), which better defines “socioeconomic” and “nutritional” frailty by the introduction of the score obtained to Social Support Scale (SSS) and Mini Nutritional Assessment (MNA). The IFi has already been validated towards Fried’s phenotype of frailty on the outcomes of disability, mortality and hospitalization (Abete P et al., 2017).

Furthermore, a pilot study was conducted on the SUNFRAIL tool in the Netherlands, by R. Gobbens. Its objectives were to determine the associations between the SUNFRAIL tool, the Tilburg Frailty Indicator (TFI), disability and indicators of health care utilization.

Further details on the Experimentation of the Sunfrail Model of Care and Sunfrail tools are reported on the specific deliverables (D 6.1; D 6.2).

7.4 Experimentation Main Results

7.4.1 Sunfrail Good Practices (RISK-ER)

A further assessment of good practices on population risk's stratification (Risk-Er,) gave the opportunity to identify the population at high and very high risk for hospitalization and disability in Emilia Romagna Region, and to support the management of these cases in primary care settings (Case della Salute), in order to avoid hospitalization.

The experimentation took place in 6 Community Health Centers (Case della Salute), where nearly 6000 people were identified through a risk profile algorithm, using existing longitudinal administrative health and social care databases to identify the risk of hospitalization (very high-high risk).

Out of the 6 Community Health Centers (Case della Salute), a total of 6.021 people were identified at high and very high risk of hospitalization (5,6 % of the patients), corresponding respectively to 2568 patients at very high risk and 3453 at high risk.

The individual patients risk profiles were provided to the Community Health Centers teams, composed by general practitioners, nurses, social workers, specialists (diabetologist; psychiatrist; cardiologist; pulmonologist; etc), with the collaboration and support of patients and voluntary associations from the territory.

The main outcomes were improved multidisciplinary pathways for the management of chronic conditions, the improvement of the compliance to therapies and the activation of social care, leading to reduced hospital and emergency admissions for ambulatory care sensitive conditions during the period 2015-2017.

An assessment of patients and health professional's opinions regarding care pathways for chronic conditions was performed (PACIC, ACIC). Using a frequency scale, patients were interviewed on their perception of the overall quality of the care received. The health professionals opinion was assessed through focus groups, to explore their opinion on the quality of health care delivery, in terms of organization and pathways; clinical information system; collaboration with the third sector; support for disease self-management.

7.4.2 Sunfrail Tool for early identification of frailty and multimorbidity

The data obtained from the application of the Sunfrail tool provided information on the capacity to create alerts on the population risk profile in different settings, and to orient the selection of care pathways. The main results are summarized below:

Sunfrail Frailty Alerts Generated in Different Settings

As indicated in table 10 below, in bold the higher proportion of frailty risk factors (alerts) applies to Polypharmacy (50,5%), Functional (53.3%), and Cognitive Decline (49.62%) items in different settings. Particularly, a high proportion of frailty alerts is found also in Community - Primary Care Settings; in a population without evident signs of disability or unknown by services (at low-medium risk for disability).

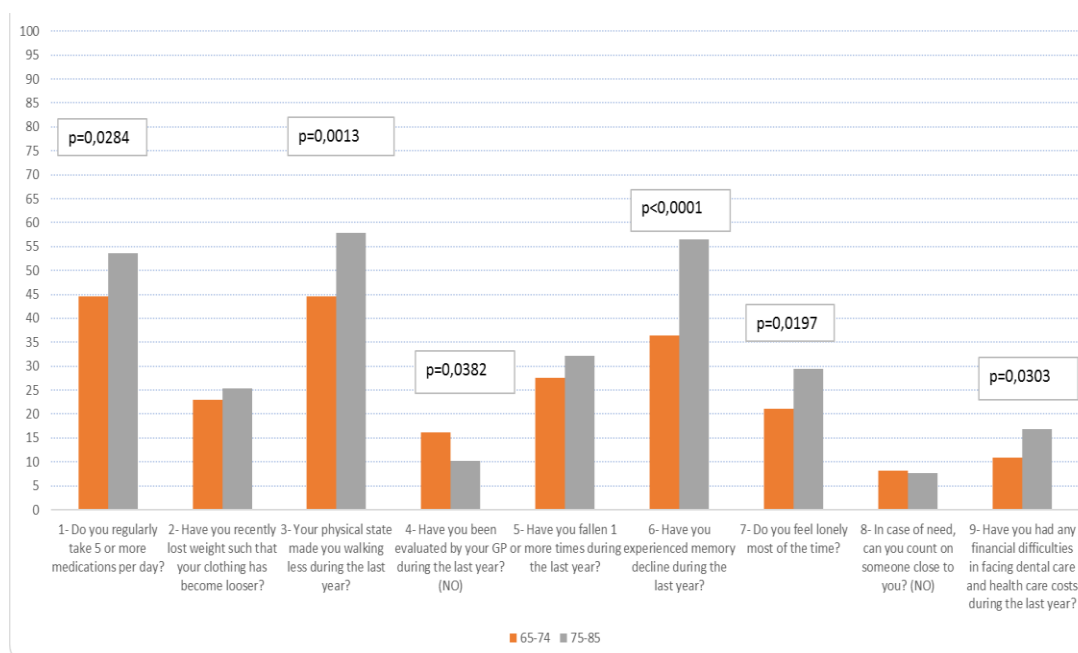
Tab. 10 - Positive Answers to the Sunfrail Tool Items by Settings

Questions	Total n=651	Secondary Care (Outpatient) (n=161)	Primary Care n=363	Community n=127
	%	%	%	%
1- Do you regularly take 5 or more medications per day?	50,54	65,22	42,7	54,33
2- Have you recently lost weight such that your clothing has become looser?	24,58	36,02	21,76	18,11
3- Your physical state made you walking less during the last year?	53,3	64,6	46,83	57,48
4- Have you been evaluated by your GP during the last year? (NO)	12,29	10,56	11,85	15,75
5- Have you fallen 1 or more times during the last year?	30,57	42,86	29,48	18,11
6- Have you experienced memory decline during the last year?	49,62	60,87	55,37	18,9
7- Do you feel lonely most of the time?	26,57	31,06	26,72	20,47
8- In case of need, can you count on someone close to you? (NO)	7,83	8,7	9,37	2,36
9- Have you had any financial difficulties in facing dental care and health care costs during the last year?	14,75	22,98	14,88	3,94

Frailty Alerts and Age

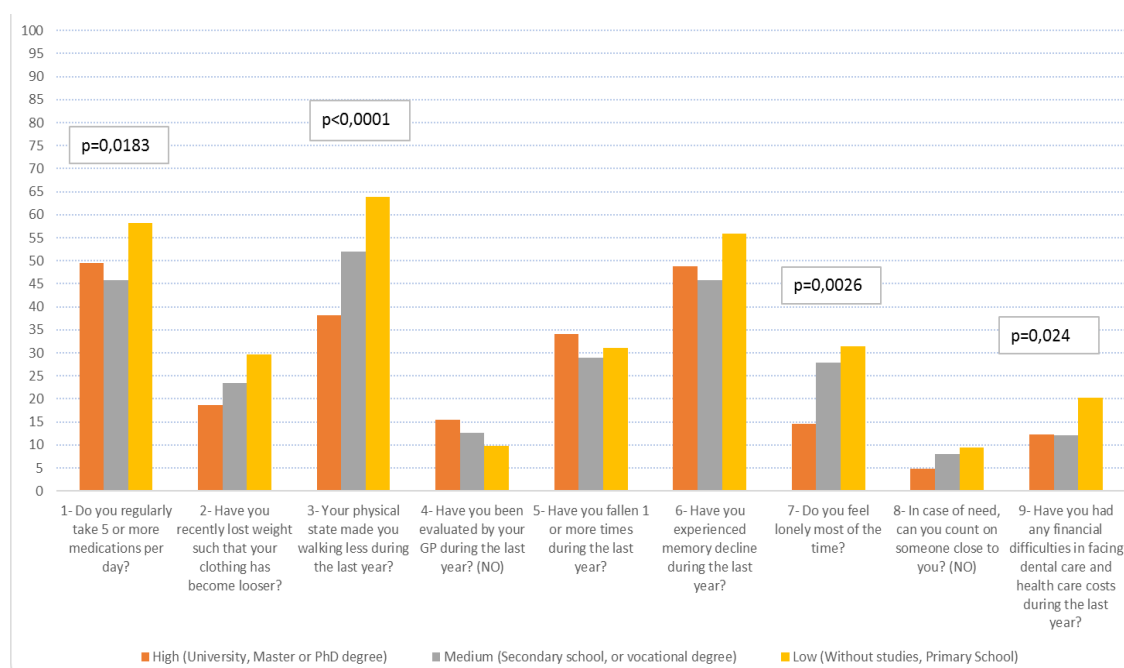
As indicated in Fig. 6, the oldest beneficiaries tended to present a higher prevalence of frailty risk factors compared to those included in the youngest age group. The relationship is statistically significant especially for cognitive decline, functional decline and polypharmacy.

Fig. 6 - % of Positive Answers to the Sunfrail Tool Items by Age groups



Frailty alerts and Education Level

Fig. 7 - % of Positive Answers to the Sunfrail Tool Items by Education Level



Citizens with a lower education level have a higher prevalence of frailty alerts and may have greater financial difficulties of access (risk for inequalities) (see Fig. 7). The relationship is statistically significant especially for functional decline, followed by feeling lonely, polypharmacy and financial difficulties.

Suggested Pathways of Care

Based on the alerts generated by the application of the Sunfrail tool and use of the flow-chart, specific care pathways were identified among available services, ranging from further diagnostics and specialist assessments, proactive interventions and social support. Overall, an important variability was found among suggested pathways across reference sites; mainly depending on the settings in which the tool was administered.

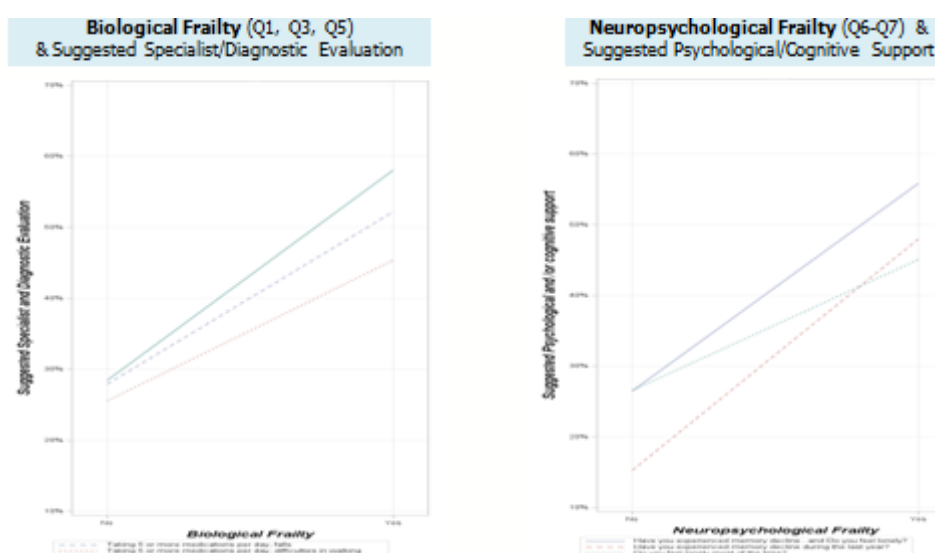
Beneficiaries with biological and neuro-psychological alerts were generally referred for further assessment or diagnostic investigation. The alerts of the biological domain brought to recommended specialist / diagnostic evaluation and the alerts of the Neuropsychological to psychological and cognitive support (see Fig. 8 below).

Community actors mainly advised beneficiaries to visit their GPs for further diagnostic assessments and/or preventive actions.

In terms of preventive activities, physical exercise, and counselling and promotion was suggested to a good proportion of beneficiaries.

Overall, the Sunfrail tool demonstrates it supports selection of existent pathways of care, and due to its biological, psychological and socio-economic dimensions fosters integrated care between services (health, social and community).

Fig. 8 - Sunfrail Tool positive answers and Suggested Pathways



Confirming Sunfrail Tool Responses with Specialist's Tests

Reference Sites testing the Sunfrail tool at secondary level facilities have confirmed frailty alerts to some items of the questionnaire (Q1, Q3 and Q6) with specialist's tests (n. of medications per day, gate speed 4-m WS, MMSE). The differences between mean values obtained (yes and no), results statistically significant.

These scenarios could be used to identify the use-cases of an innovative tool supporting diagnosis and management of patients.

7.4.3 *A positive example of Community and Beneficiaries Involvement*

In Northern Ireland the Sunfrail Tool was used to improve the overall provision of services for older people in the community. A “Sunfrail directory” comprising of Trust, community and voluntary sector services on identifying, preventing and managing frailty was used to signpost older people to services available within their community in response to the alerts generated by the Sunfrail Tool. The application of the tool enabled services staff to gain a better understanding of: 1) frailty from the different bio-psycho-social domains, 2) relevance of services available and roles of professionals and community actors 3) how to use the tool in particular in a community setting.

The use of the tool with beneficiaries in a number of community, social and GP settings helped to raise awareness of frailty with older people in general and in some cases to identify risk factors for frailty at an early stage, such as loneliness and decrease in physical activities. It also helped to promote existing services for older people (falls and balancing classes, walking groups, social clubs etc.). The Trust used the tool to identify any gaps in services and to adopt corrective measures (e.g. malnutrition).

A follow up on beneficiaries was done with the aim to assess the impact of the signposting advice given during the administration of the Sunfrail tool and to enable services organizers to assess uptake of co-produced actions from each individual care plan, highlight positive outcomes and identify existing unmet need.

The results showed that more than half (58%) of the 26 beneficiaries had taken up at least 1 of their person-centred Sunfrail care pathway recommendations. The project has helped to stress the significance of improving communication and access to the service to the elderly population; thus to bridge the gap between services users and providers.

7.4.4 *The assessment of professional's opinion on the applicability and transferability of the SunfrailTool*

The assessment of professional and community actor opinion on the use of the Sunfrail Tool was performed by all reference sites testing the Sunfrail tool, with the aim to assess:

1. Whether the tool is suitable to identify the domains of frailty and to activate care pathways;
2. Whether it is easily understandable and applicable during the daily professional/care practice;
3. Whether it needs to be modified/improved and how.

The questionnaire included closed and open-end questions.

Main Key Findings:

- The tool is user friendly and easy to apply. It is non-invasive and suitable for the everyday practice.
- It can help identifying early frailty conditions, promoting further interventions / assessments and mapping services and resources networks necessary to activate sustainable and accessible care pathways.
- The tool can improve beneficiaries awareness, encouraging them to move from a “disease” oriented vision to a protective and preventive approach.

7.4.5 *Results on the Application of the Model and tools for Human Resources Development*

A short experimental course focussing on the application of the Sunfrail tool was carried out for a multiprofessional audience involving GPs, geriatricians, psychologists, nurses, physiotherapists, social workers, pharmacists and administrative staff. The main findings confirmed that an innovative interprofessional course for health and social care professionals about the detection, prevention, and management of frailty should have the following features:

1. Explain the multidimensionality of frailty according to the bio-psycho-social model of Sunfrail, and enhancing the reversibility of this condition;
2. Addressing professionals from the health and social services;
3. Helping professionals to recognize frailty in the final 'beneficiaries' and to address it by using the resources available in the existing public services;
4. Helping community actors to detect frailty in its early stages, also for those that do not reach professionals or services;
5. To develop an informal contexts for the administration of the Sunfrail tool, helping the contact between beneficiaries and the investigator.

As a result of the multiprofessional training, some Local Health Trusts and General Practitioners had requested to apply the Sunfrail Tool in their current professional practice.

Further details on the Experimentation of the Sunfrail Educational Model and of the Sunfrail tools are reported on the specific deliverables (D 7.1; D 6.2).

7.5 *Experimentation Main Findings*

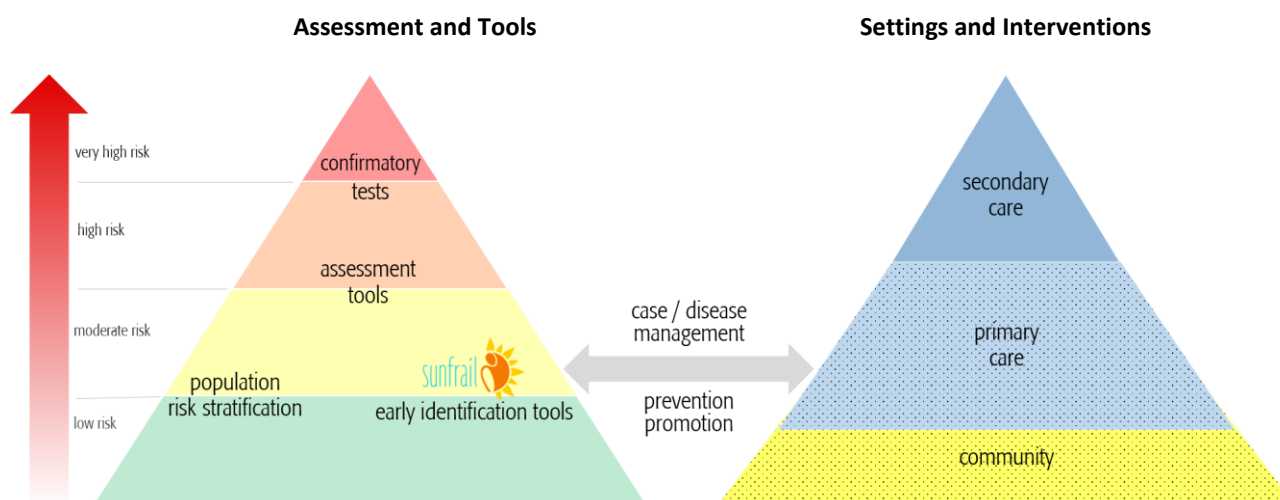
7.5.1 *Identifying and caring for Frailty and multimorbidity: the Sunfrail Model*

As detailed on the Fig. 9 below, the Sunfrail model allowed designing a frame of Reference Sites health systems and services on frailty and multimorbidity that can be summarized by these 2 pyramids; reflecting respectively "strategies and tools of assessment" and "settings and interventions". The frame captures the dimensions of frailty and multimorbidity (biological, neuro-psychological and socio-economical), the related sectors involved, aimed at considering ageing population overall needs.

The model facilitates the integration between Reference Sites strategies and good practices. Some are focussing on population risk stratification for the identification and management of high risk and very high risk cases, while others are related to early identification and prevention, thus taking into consideration a population with lower risk profile. By targeting cases at low and medium risk (interesting the majority of the population), the Sunfrail tool complements these strategies with proactive and preventive interventions aimed at avoiding hospitalization and disability.

It is from the integration of these strategies and approaches that the Sunfrail Model provides an orientation to existent health systems and services, overall aiming at shifting the paradigm from costly intensive care to a proactive and preventive care targeting the majority of the population, and to save resources by connecting existent health, social and community services.

Fig. 9 - Sunfrail Model



7.5.2 The application of the sunfrail tool on frailty and multimorbidity

The Sunfrail tool allows identifying frailty risk alerts in the population 65 years and over of community dwelling settings. The most frequent alerts were on functional decline, cognitive decline and polypharmacy items in all settings. In community and primary care settings the alerts generated were particularly significant, for the high prevalence identified, and as the testing was done on a target population *without evident signs of physical and cognitive disability*; indicating the overall capacity of the tool to detect frailty risks in the general population (at low-medium risk for hospitalization and disability).

The Sunfrail tool allows also to identify the population with major risk for inequality, as citizens with a lower education level have a higher prevalence of frailty alerts and may have greater financial difficulties of access. Therefore, a specific attention may be necessary in addressing equity aspects for this target group in services planning and delivery.

Frailty alerts on polypharmacy, functional decline and cognitive decline items are confirmed by specialist's tests (n. of medications per day, gate speed 4-m WS and MMSE), suggesting that alerts could be further confirmed by a multiprofessional team already in primary care settings.

Due to its biological, psychological and socio-economic dimensions, the Sunfrail tool supports selection of existent pathways of care, fostering integration between available services and sectors, or in alternative point out the needs for improvement. This can be done in integration with other available tools (es: Telerehabilitation, Memory training, serious games, others.).

The application of the Sunfrail tool allows bridging the gap between services offer and access especially in primary care and community settings. This can be reached by a) improving beneficiaries awareness on their risk factors and on services available and b) promoting multiprofessional involvement and the integration between available services (health, social, community), with an overall effect of maximizing existent resources and saving costs.

7.5.3 Potential for applicability and replicability in other e countries

The Sunfrail tool has been also adopted in other EU countries/Regions (France, Slovenia, Austria), through the EU CoSENSO project (COmmunity Nurse Supporting Elderly iN a changing Society-<http://www.alpine-space.eu/projects/consenso/en/home>). Its results confirm the adaptability and replicability of the tool by different professionals in different settings (eg: community nurses).

A pilot study was conducted on the SUNFRAIL tool also in the Netherlands, by R. Gobbens. Its objectives were to determine the associations between the SUNFRAIL tool and the Tilburg Frailty Indicator (TFI), disability and indicators of health care utilization. Prof. Gobbens described the Sunfrail tool as a *“promising instrument to measure frailty in older people”*.

The adaptability and usability of the Sunfrail tool was also tested through an analysis of the data collected with the definitive version of the Carsat good practice (the Carsat-LR AHA grid by the Gerontopôle of Toulouse). The results confirm that the theoretical and methodological construct of the SUNFRAIL instrument is already used in services/initiatives to describe the risk-profile and provide support to community-dwelling older persons. For this reason, the tool can be modeled and implemented in a relatively easy and consistent way in already ongoing services devoted to the prevention of disability in older adults.

A pilot study was conducted also by the Campania Region, Azienda Ospedaliera Universitaria “Federico II” (Geriatric Evaluation Unit), to determine the associations between the Sunfrail tool and the Italian version of the Frailty index (IFI) (a modified version of Rockwood’s clinical frailty index). A linear regression analysis between these two tools has showed a good linear correlation with a r value of 0.67.

A Further pilot study on the validation of the Sunfrail tool is currently ongoing also in Emilia-Romagna Region.

Requests for adoption of the Sunfrail tool were made also from GPs, Italian Local Health Trusts, Italian and European Regions of the European Innovation Partnership on Healthy and Active Ageing (EIP-AHA).

The integration of these approaches and tools may support a larger scale diffusion of the instruments across Europe and help in rethink and reshape the already ongoing clinical, primary care and community service to the prevention and management of frailty.

The collaboration with the Joint Action on Frailty (Advantage), promotes a further adoption and replication of the designed tools and model in other EU countries.

8. CONCLUSIONS

Frailty is a reversible condition. It is important to consider it through the main dimensions (biomedical, psychological, individual and socio-economical) and main risk factors, in order to orient proactive and preventive strategies.

Frailty alerts can be identified especially in community and primary care settings, with a population that *may be unknown* by services. For this reason it's important to improve services response focussing on *early identification* by different professionals and community actors and further professional assessment.

Frailty requires operational responses, to confirm the condition and to generate pathways by *connecting existent health, social and community services* with a multidisciplinary and intersectoral approach. As the most frequent alerts generated by the Sunfrail tool were on functional decline, cognitive decline and polypharmacy items in all settings, pathways of prevention and care needs to consider these aspects. The integration of services provided by the health and social sector, cost recovery rules and affordability by beneficiaries need to be also carefully assessed.

It is important to bridging the gap between services provision and utilization, by considering beneficiaries need for independent life, and working on their awareness of risk factors and on preventive activities and services available, involving families, associations, circles, pharmacies. At the same time it is necessary to work with professional's knowledge of frailty, team work approach, and services integration.

The Sunfrail Model allow detecting the population risks of hospitalization and disability, helping to shift the paradigm from costly intensive care to a proactive and preventive care targeting the majority of the population; thus to save resources by connecting existent services. Population risk stratification strategies (and related health and administrative information systems), can contribute to measure services outcomes and costs.

Frailty risks factors are found especially in citizens with lower educational level. This may influence their access to care due to cultural barriers and financial constraints. Policy makers and services planners need to pay a specific attention on ageing population *inequalities*. At the same time, planning services with a multisectoral and integrated approach will help to provide more efficient responses across services and sectors and to save resources.

Annexes

ANNEX I: ASSESSMENT OF PARTNERS HEALTH AND SOCIAL SYSTEMS - COUNTRY HIGHLIGHTS

For the Full Report: <https://issuu.com/sunfrail/docs/healthandsociasystems.20.11.2016.fi>

Tables A 1-4 Key Demographic and Macroeconomic Data

A 1. Main demographic and macroeconomic data, NATIONAL and REGIONAL level

	EU MEMBER STATE/NATIONAL LEVEL						France			Italy			Poland	Spain	UK
	France	Italy	Poland	Spain	UK		Midi- Pyrénées	Languedoc- Roussillon	Piemonte	Liguria	Emilia- Romagna	Campania	Lódzkie	País Vasco	Northern IR
Demography (2014)															
Population (million)	65,83	60,79	38,02	46,51	64,31		2,97	2,76	4,44	1,59	4,44	5,87	2,50	2,17	1,84
Children population (0-14) as % of total population	19%	14%	15%	15%	18%		17%	17%	13%	12%	14%	16%	14%	14%	20%
Prime age population (25-54) as % of total population	39%	42%	43%	45%	41%		38%	37%	41%	39%	42%	43%	42%	44%	41%
Working age population (15-64) as % of total population	63%	65%	70%	67%	65%		63%	62%	63%	61%	63%	67%	69%	65%	65%
Elderly population (65 and over) as % of total population	18%	21%	15%	18%	18%		20%	21%	24%	28%	23%	17%	17%	21%	15%
Very elderly population (80 and over) as % of total population	6%	6%	4%	6%	5%		7%	7%	7%	9%	7%	5%	4%	7%	4%
Very elderly population (80 and over) as % of elderly population	32%	30%	26%	31%	27%		33%	30%	31%	32%	30%	26%	27%	32%	26%
Very elderly population (80 and over) as % of working age population	9%	10%	6%	9%	7%		11%	11%	12%	15%	12%	7%	6%	10%	6%
Fertility rate (2013)	1,99	1,39	1,29	1,27	1,83		1,84	1,94	1,41	1,34	1,45	1,28	1,25	1,30	1,96
Life expectancy at birth (years) (2013)															
men	79	80,3	73	80,2	79,2		80,2	79,1	80,1	79,8	81,1	78,4	70,7	80,2	78,3
women	85,6	85,2	81,2	86,1	82,9		86,4	85,8	85,1	85,0	85,6	83,6	80,1	87,1	82,5
Life expectancy at 65 (years)															
men	19,3	18,9	15,5	19,2	18,6		19,9	19,6	18,7	18,6	19,4	17,7	14,7	19,3	18,1
women	23,6	22,6	19,9	23,4	20,9		24,2	23,9	22,4	22,4	22,9	21,2	19,2	24,5	20,6
Population change (thousand) (2013)															
	274,9	1097,4	-44,7	-215,7	445,9		20,0	28,9	62,7	26,8	68,9	100,2	-11,5	-9,2	9,2

Net migration as % of population (2013)	0,05%	1,98%	-0,07%	-0,54%	0,38%	0,54%	0,91%	1,76%	2,40%	1,79%	1,73%	-0,11%	-0,42%	-0,01%
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A 2. Main demographic and macroeconomic data NATIONAL level					
	France	Italy	Poland	Spain	UK
Dependency ratios: (source EC the Economic Policy Committee ³) (2013)					
Share of older population (55-64) (a)	19.8	19.2	20.3	17.1	17.5
Old-age dependency ratio (b)	28	33	21	27	27
Total dependency ratio (c)	57	54	42	50	54
Total economic dependency ratio (d)	144	173	132	172	112
Economic old-age dependency ratio (15-64) (e)	43	57	33	48	35
Economic old-age dependency ratio (15-74) (f)	42	56	32	48	34

3. http://ec.europa.eu/economy_finance/publications/european_economy/2015/pdf/ee3_en.pdf

(a) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(b) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(c) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(d) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(e) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(f) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

A 3. SELECTED MACRO ECONOMIC and SOCIAL EXCLUSION INDICATORS

	EU MEMBER STATE/NATIONAL LEVEL					France		Italy			Poland	Spain	UK	
	France	Italy	Poland	Spain	UK	Midi-Pyrénées	Languedoc-Roussillon	Piemonte	Liguria	Emilia-Romagna	Campania	Lódzkie	País Vasco	Northern IR
Macroeconomic data														
Gross domestic product (GDP) Euro per inhabitant (2013)	32.100	26.500	10.300	22.500	31.500	28.600	24.500	28.300	30.000	32.300	16.800	9.600	29.300	23.700
Gross domestic product (GDP) (Purchasing Power Standards per inhabitant) (2013)	28.400	26.300	17.900	25.000	28.900	25.300	21.700	28.100	29.700	32.000	16.600	16.700	32.500	21.800
GDP, Euro per inhabitant in percentage of the EU average (2013)	121%	100%	39%	85%	118%	108%	92%	107%	113%	121%	63%	36%	110%	89%
GDP, Purchasing Power Standards per inhabitant in percentage of the EU average (2013)	107%	99%	67%	94%	109%	95%	82%	106%	112%	120%	63%	63%	122%	82%
GDP growth (% YoY) (2013)	0,30%	-1,40%	1,80%	-1,20%	1,50%	1,20%	2,00%	ND	ND	ND	ND	ND	-1,80%	ND
Employment rates (%) (2014)	63,8%	55,7%	61,7%	56,0%	71,9%	66,2%	58,7%	62,4%	60,7%	66,3%	39,2%	64,4%	61,8%	66,9%
Unemployment (%) 25 years or over (2014)	8,9%	10,6%	7,6%	22,3%	4,4%	7,9%	10,5%	9,3%	9,0%	6,8%	18,7%	7,9%	15,0%	4,5%
Social exclusion indicators (2013) %														
People at risk of poverty or social exclusion ^a	18,1%	28,4%	25,8%	27,3%	24,8%	nd	nd	16,8%	24,5%	17,7%	49,0%	16,8%	nd	nd
At-risk-of-poverty rate ^b	10,5%	19,1%	20,4%	17,3%	15,9%	14,5% ² ₀₁₀	19,4% ² ₀₁₀	11,6%	16,7%	10,8%	36,8%	10,5%	nd	nd
Severe material deprivation rate ^c	4,9%	12,4%	6,2%	11,9%	8,3%	nd	nd	4,9%	9,4%	8,4%	20,9%	4,8%	nd	nd
People over 75 living Some or severe material deprivation	2,6%	10,5%	10,4%	2,3%	1,6%									

^a people either at risk of poverty, or severely materially deprived or living in a household with a very low work intensity. It presents the share of the total population which is at risk of poverty or social exclusion, is the headline indicator to monitor the EU 2020 Strategy poverty target.

^b the share of people with an equivalised disposable income (after social transfer) below the at-risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income after social transfers.

^c a state of economic strain and durables, defined as the self-refereed enforced inability (rather than the choice not to do so) to pay at least 4 of the following: unexpected expenses, afford a one-week annual holiday away from home, a meal involving meat, chicken or fish every second day, the adequate heating of a dwelling, durable goods like a washing machine, colour television, telephone or car, being confronted with payment arrears (mortgage or rent, utility bills, hire purchase instalments or other loan payments).

A 4. SELECTED COUNTRY DATA ON PERCEIVED HEALTH STATUS, HEALTH AND SOCIAL CARE EXPENDITURE					
	France	Italy	Poland	Spain	UK
<u>Perceived Health Status (2013) %</u>					
People over 75 who state their health is 'Very good and good'	29,1%	19,2%	10,4%	31,5%	45,4%
People over 75 who state their health is 'Very good and I income quintile (lower)	25,2%	15,8%	5,6%	23,5%	46,9%
People over 75 who state their health is 'Very good and good' V income quintile (higher)	38%	26,9%	19,7%	41,5%	70,6%
Self-reported unmet needs for medical examination: people over 75	1,6%	7%	5,1%	0,3%	Nd
Self-reported unmet needs for dental examination because too expensive, too far to travel or due to waiting lists, people over 75	4,4%	8,9%	2,7%	3,9%	1,5%
<u>Main Health expenditure data (2013) ^d</u>					
Current expenditure on health, % of gross domestic product	10,9%	8,8%	6,4%	8,8%	8,5%
Current expenditure on health, per capita, US\$ purchasing power parities	4.124	3.077	1.530	2.898	3.235
Public expenditure on health, per capita, US\$ purchasing power parities	3.247	2.381	1.081	2.073	2.802
Public expenditure on health, % of current expenditure on health	78,7%	77,4%	70,6%	71,5%	83,3%
Out-of-pocket expenditure on health, % of current expenditure on health	6,7%	21,7%	23,6%	23,8%	9,5%
<u>General government expenditure (2013) % of GDP</u>					
<u>Net social protection as a percentage of GDP</u>	32,3%	26,8%	15,7%	24,6%	27,8%
Net social protection exp. for Disability	2,0%	1,7%	1,3%	1,8%	1,9%
Net social protection exp. for Old age	11,5%	12,5%	7,1%	8,4%	11,8%
<u>Old age pension, Purchasing Power Standard per inhabitant (€) ^e</u>	3.544	2.977	1.328 ²⁰¹²	1.869	2.857
<u>Households by size (2013) %</u>					
One person	35,1%	32,3%	23,7%	23,5%	28,5%
Two or three people	46,5%	46,1%	45,9%	52,5%	52,6%
Four or more people	18,4%	21,6%	30,4%	24%	18,8%

^d Source: OECD Health statistics 2015, extracted on 29 January 2015 / ^e Old age pension, Purchasing Power Standard per inhabitant (€): Expenditure on pensions comprising: disability pension, early retirement due to reduced capacity to work, old-age pension, anticipated old-age pension, partial pension, survivors' pension and early retirement due for labour market reasons.