Deliverable reference number: **D3.1**	Date: 31/12/2013
Deliverable title: **Guidelines Handbook**	
Project Title: Network for the Market uptake of ICT for Ageing Well Project Acronym: **Ageing*Well***	Responsible partner: INOVA+
	Editors: Ana Solange Leal (INOVA+) Andrea Bogi (INOVA+)
Grant Agreement no. 297298	Validated by: All partners
Project co-funded by the European Commission within the ICT Policy Support Programme	Dissemination Level: Public

Abstract:

This version of the Guidelines handbook provides updated information about the context situation in the home countries of the **Ageing***Well* founding members, as well as of the associate members, delving into micro and macro environment for ICT and Ageing. Then, it points out the main existing market barriers which hamper the uptake of ICT solutions for Health and Ageing. Finally, it maps public and private funding possibilities addressing initiatives on ICT and Ageing fields both at European and National levels.

Revision History:

Revision	Date	Author	Organisation	Description
V.01	31/12/2013	Ana Solange Leal	INOVA+	First draft of the Deliverable

Statement of Originality

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate

Table of Contents

1 Introduction

1.1 Background

The aim of the **Ageing***Well* Network **is to build and animate a European network focused on improving the quality of life of Elderly People by promoting the market uptake of ICT solutions for Ageing.**

To achieve its aim, the following five **main objectives** of the **Ageing***Well* project are:

- **Develop** guidelines for deployment and sharing of best practice between key competence centres;
- **Build** an ICT for Ageing Knowledge Centre with the aim to share the results with the Ageing Well Community;
- **Develop** an ICT for Ageing Society Strategic Agenda, with the aim of providing a study on options for future structure and implementation of EU innovation funding;
- **Promote** the European innovation reinforcement between innovative ICT industries and Ageing (in particular SMEs) and Venture Capital firms, Business Angels and other;
- **Raise awareness** within the European community of ICT and Ageing stakeholders through web-based communication and the organization of 3 international events and 11 national events.

1.2 Summary

This version of the Guidelines handbook provides updated information about the context situation in the home countries of the **Ageing***Well* founding members, as well as of the associate members, delving into micro and macro environment for ICT and Ageing. Then, it points out the main existing market barriers which hamper the uptake of ICT solutions for Health and Ageing. Finally, it maps public and private funding possibilities addressing initiatives on ICT and Ageing fields both at European and National levels.

2 Member States Context

A brief presentation of the population and economical environment for the development of the ICT for Health sector is made for each country of the founding and associate members of the **Ageing***Well* Network.

2.1 Austria

With a population of nearly 8 and a half million people, Austria is the 18th most populous country in the EU. Its old dependency rate is 26.2% as of 2013 and has remained more or less stable in the past few years due to the stabilization of the over 65 population around 17.6% (+0,2 in 2012 provisional stats)[1].

Despite to outburst of the Euro-crisis, Austria managed stay clear of the worse effects on its economy, registering a growth of GDP of 2.8% in 2011 and almost 1% in 2012, though those figures are expected to shrink slightly in 2013[2]. Constantly one of the richest countries in Europe by GDP per capita with 131 (EU28=100), behind only Luxembourg, Norway and Switzerland, Austria can also take advantage of one of the lowest unemployment rate in the EU at 4.3%, less than half of the communitarian average of 10.5% (2012)[3], and a still manageable, tough growing, public debt at 74% of the country's GDP[4].

The Austrian economy has large service and industrial sectors, as well as a strong tourism sector accounting for 9% of the country's annual GDP, which is just about 307 millions of Euro in 2012[5]. On the other hand, the ICT sector registered a sensible reduction in terms of contribution to GDP since the early 2000s, passing from 5.27% in 2000 to 3.17% in 2010[6], despite some of the main companies in the sectors are worth millions of Euro, such as Telekom Austria AG (Net turnover over 4 millions Euros) or Raiffeisen Informatik GmbH (1.5 millions Euros). A lack of support to the ICT sector that is reflected in the mere 36% of the population working in science and technology[7] (9.5% in health and social-related services[8]) against an EU average of 39% (10.5%).

Regarding connectivity, instead, Austria is one of the most efficient countries in Europe with 79% of its households connected to internet[9] (98% with broadband[10]) in 2012. The Country is also within EU standards with 25% of over-65 internet users, 17% of which searching health-related info[11].

R&D investments are also particularly high, reaching 2.75% of the total GDP in 2011. In particular, public support for ICT R&D amounted to Euros309.9M, around 13% of total public funding for R&D, above EU average, against only 10% from business expenditures on R&D[12].

[1] EUROSTAT Database, Structure Indicators, Population on 1st Jannuary; EUROSTAT Database, Structure Indicators, Old dependency ratio.
[2] EUROSTAT Database, GDP and Main Components.
[3] EUROSTAT Database, Unemployment rate by sex and age groups – annual average.
[4] EUROSTAT Database, Government deficit/surplus, debt and associated data.
[5] EUROSTAT Database, GDP and Main Components.
[6] EUROSTAT Database, Percentage of the ICT sector on GDP / Total (National Accounts).
[7] EUROSTAT Database, Employment in technology and knowledge-intensive sectors at the national level, by type of occupation.
[8] EUROSTAT Database, Employment in technology and knowledge-intensive sectors at the national level, by sex.
[9] EUROSTAT Database, Households - Level of Internet access.
[10] EUROSTAT Database, Households - Broadband and Connectivity.
[11] EUROSTAT Database, Internet activities – Individuals.

Some of the most relevant Austrian clusters in ICT and health are:

- **Cluster Life Sciences Tyrol** – it comprises innovative companies, institutions and universities with more than 23000 employees in what is now the second largest life sciences region in Austria. Working to foster coordination, cooperation, development and expansion among practitioners and researchers from various fields, the Clusters aims at bringing together business owners and entrepreneurs and researchers by motivating and promoting strategic innovation work and research and initiate and coordinate joint projects among members. Companies and research institutions in the cluster meet in particular the following technology fields from: Biotechnology, Pharmaceuticals, Medical, Services, Research & Education[13].
- **The Health Technology Cluster** – it is a network, spanning a number of business sectors, for strengthening the innovative capacity and international competitiveness of companies in medical technology, and of their suppliers and relevant institutions involved in educational and technology transfer. The scope of activities includes the medical electronics, software, clean room & hygiene, hospital equipment, end-use products, diagnostics-pharmacy and materials (metal/plastics) with a strong emphasis on promoting companies in the medical technology sector. At the core of the cluster activities is the strengthening and expansion of the medical technology sector and the cooperation of companies and healthcare institutions. A further objective is to drive forward cooperative efforts with the Austrian national government and the governments of other Austrian provinces[14].

2.2 Belgium

Belgium has a population of about 11 million people, where 17% is aged over sixty-five[15]. The elder population tends to increase as a reflexion of the ageing phenomena occurring all over Europe, which will contribute for increasing the old-age dependency ratio that was of 26% in 2011[16].

Economically, the global financial crisis caused a slowdown in Belgium economy aggravated by a Public Debt nearing 98% of the national GDP[17]. Following an increase of 1.9%, the growth estimates for 2012 was of 0%, which lead the country to face a budget consolidation to reach a more sustainable debt level in the medium term.

Located in central Europe, Belgium benefits from a strong geographical advantage for establishing business throughout the EU and beyond, namely concerning services provision, as the Belgium economy is service based. In fact, the services sector represents over 75% of all economic activity. The labour market has a highly skilled workforce, with about 48%[18] of the active population engaged

[12] Austria: ICT R&D and participation to FP7.
https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/AT_FP7_0.pdf
[13] http://www.standort-tirol.at/page.cfm?vpath=index
[14] http://www.gesundheits-cluster.at/index_ENG_HTML.php
[15] EUROSTAT Database, Structural Indicators, Population on 1 January
[16] EUROSTAT Database, Structural Indicators, Old dependency ratio
[17] In 2011, the Belgium GDP was of 369.836 millions EUR. Source: EUROSTAT DATABASE Database, GDP and main.
[18] EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions

in Science and Technology, and over 12%[19] working in technology and knowledge-intensive sectors in health and social work areas.

Concerning the use of internet, in 2011, more than 75% [20]of households had internet access of which 96% are high-speed internet connections[21]. In 2005, only 50% of the households were connected, so there was a high positive increase in this domain. About users, in 2010, 33%[22] had 65 or more years old, which is relatively high percentage in contrast to other European countries, from which 19% (in 2011)[23] accessed Internet for seeking health-related information.

The ICT sector represented, in 2006, 6% of Belgium GDP and it is mainly composed by very small enterprises (2500 enterprises of less than 10 persons), although there are also well known big companies in the country, such as Philips and Siemens. The sector is mainly focused on the provision of services. In addition, confirming the relevance of this sector is the heavily investment in RandD, representing near 20% of total RandD efforts in Belgium[24], although it has been diminishing due to financial crisis that Europe is facing since a few years.

Nevertheless, Belgium has the infrastructures for developing an ICT for Ageing sector and by this supporting its ageing population, with clear benefits in social and economic terms. The existence of clusters related to this area stresses the importance of the sector for the Belgium society, as follows:

- **BioWin, The Health Cluster of Wallonia** - created in July 2006, BioWin brings together all the Walloon stakeholders participating in innovative projects and/or training in the fields of biotechnology and healthcare. The cluster intends to promote the strengths of local stakeholders in the fields of biotechnology for healthcare and medical technology internationally[25].
- **FlandersBio** - Founded in 2004, it is a not-for-profit umbrella organisation for the life sciences and biotechnology sector in Flanders, aiming at build sufficient critical mass to attract new RandD companies, investors, service and technology providers[26].
- **Healthcare Belgium** - a non-profit organisation established in 2007 by the most prominent Belgian hospital groups, holding a multitude of international collaboration agreements at the level of the Ministries of Health, academic institutions and hospitals. Collaborations consist in academic and clinic knowledge transfer, health technology implementation (including equipment and medical devices) and patient treatment[27].

2.3 Bulgaria

In January 2012, over 7 million of people constituted the Bulgarian population, where near 18% was aged over sixty-five[28] with a dependency ratio of 27%[29]. Following the situation in the rest of the

[19] EUROSTAT Database, Annual data on employment in technology and knowledge-intensive sectors at the national level
[20] EUROSTAT Database, Households - Level of Internet access
[21] EUROSTAT Database, Broadband and Connectivity – Households
[22] EUROSTAT Database, Internet activities – Individuals
[23] EUROSTAT Database, Internet activities – Individuals (Internet use: seeking health information)
[24] EUROSTAT Database, Percentage of the ICT sector on GDP - Total (National Accounts).
[25] http://www.biowin.org
[26] http://flandersbio.be
[27] http://www.healthcarebelgium.com
[28] EUROSTAT Database, Structural Indicators, Population on 1 January

European countries, these percentages have been increasing the last few years and therefore represent challenges for the Bulgarian social security system and its sustainability.

In 2011, GDP was of over 38 millions of Euros with an estimate of 2% growth by 2014[30]. The Public Debt reaches 16%[31] of the GDP. Thus, despite the economic crisis and difficulties existing in Europe, Bulgaria has been managed to have one of the lowest public debts, which gives positive signs for the coming years.

The Bulgarian economy is still based on industry, although it is visible an increasing contribution of the services sector for GDP. Despite the active population with qualification in Science and Technology (31.1% in 2011)[32], the employment rate in technology and knowledge-intensive sectors on Health and Social Work represented, in 2007, less than 5%[33]. Also, the country has one of the EU's lowest percentages on RandD investment, representing only 0.57% of its GDP in 2011[34].

In terms of infrastructures for the ICT the country has been witnessing a fast development, with over 50% of household, in 2012, having access to the internet, when in 2006 this rate was of 17%[35]. Currently, 89% of the access to internet is made through a high-speed connection[36]. In addition, in 2010, only 3%[37] population aged over sixty-five were using the internet and only 5%[38] of these users accessed it for seeking health related information, which represents one of the lowest percentages in the EU.

According to the Bulgarian Association of Software Companies (BASSCOM), the ICT sector generated near 9% of the GDP in Bulgaria, in 2010. The sector is composed mainly by small and medium enterprises dedicated to the provision of services. In fact, in 2009, 98% of the value added in the ICT sector was provided by ICT services sub-sector[39]. However, the investment in RandD related to ICT is not very significant, representing in 2007 around 1%[40] of the overall investment in RandD in Bulgaria, which, as mentioned before, is very low (0.57%).

Nevertheless, there are some organisations in Bulgaria whose objective is promoting the ICT sector and eHealth solutions and services, as a way for improving the country's economy:

- **Foundation "Bulgarian Cluster for Information and Communication Technologies"** – created in 2005, its main objective is ICT SME growth and development through promotion of cooperation, building competitiveness and creation of new business opportunities[41].
- **E-Health Bulgaria Foundation** - a nonprofit and non-governmental organization, established to boost the development of the e-health on a national level as a part of the electronic

[29] EUROSTAT Database, Structural Indicators, Old dependency ratio
[30] EUROSTAT Database, GDP and main components (forecast)
[31] EUROSTAT Database, Government consolidated gross debt
[32] EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions
[33] EUROSTAT Database, Annual data on employment in technology and knowledge-intensive sectors at the national level
[34] EUROSTAT Database, Total intramural RandD expenditure (GERD) by sectors of performance
[35] EUROSTAT Database, Households - Level of Internet access
[36] EUROSTAT Database, Broadband and Connectivity – Households
[37] EUROSTAT Database, Internet activities – Individuals
[38] EUROSTAT Database, Internet activities – Individuals (Internet use: seeking health information)

[39] The 2012 Predict Report - An Analysis of ICT RandD in the EU and Beyond. Joint Research Centre Scientific and Policy Reports, 2012.
[40] EUROSTAT Database, RandD expenditure (BERD) of businesses in ICT sector as % of total RandD expenditure
[41] http://www.ictalent.org

government of the Republic of Bulgaria, and which cooperates with all participants and interested parties in the healthcare process, such as the Ministry of Healthcare, the National Health Insurance Fund, private health insurance funds, hospitals, pharmacies, laboratories, medical doctors and patients[42].

2.4 Cyprus

Cyprus is a small Mediterranean country with a population of less of one million people, where near 12% of people has over sixty-five years old (below EU average of 17.5%)[43]. The old dependency ration reached 18% in 2012[44]. This situation makes of Cyprus one of the youngest countries in Europe.

The Public Debt raised to near 70% of the GDP in 2011[45], partially due to the banking crisis which arose in 2008 and to the exposure of Cypriot banks to Greek bonds that pushed the country's economy to a recession, which still produces its effects today, and forced an EU bailout request by public authorities as well as loans from Russia. With forecasts indicating that GDP growth will be negative in the next few years (estimates of -2.3% in 2012, -3.5% in 2013 and -1.3% in 2014)[46], times will be challenging in the near future.

The Cyprus economy is dominated by the service sector in which communication technologies related services play a very important position. In fact, in 2009, 99% of the value added in the ICT sector was provided by ICT services sub-sector[47], which clearly demonstrates the existing focus of the economy activities. The country has attracted major players in this sector, such as IBM, Oracle and Microsoft to establish operations there, and thus contributing for a high employment rate in ICT jobs. The workforce of Cyprus is highly qualified in Science and Technology areas, with a share of 45%[48] of the active population in 2011. Nevertheless, the percentage of people working on technology and knowledge-intensive sectors on Health and Social Work is still very low (4% in 2008[49]), which can be partially explained due to demographic factors and to the fact of the majority of the economy is focused on the provision of telecommunication services.

In terms of infrastructures related to ICT, in 2012, 62%[50] of the households had internet access (which represents a rate below EU average) of which near 95%[51] through a high-speed connection. Concerning internet users, in 2011, near 6% were older than 65 years old (against EU's average of 24%), and only 5% of these users were seeking health information on the internet (against EU's average of 18%).

[42] http://www.ehealth-bg.org
[43] EUROSTAT Database, Structural Indicators, Population on 1 January
[44] EUROSTAT Database, Structural Indicators, Old dependency ratio
[45] EUROSTAT Database, Government consolidated gross debt
[46] EUROSTAT Database, GDP and main components (forecast)
[47] The 2012 Predict Report - An Analysis of ICT RandD in the EU and Beyond. Joint Research Centre Scientific and Policy Reports, 2012.
[48] EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions
[49] EUROSTAT Database, Annual data on employment in technology and knowledge-intensive sectors at the national level
[50] EUROSTAT Database, Households - Level of Internet access
[51] EUROSTAT Database, Broadband and Connectivity – Households

2.5 France

France, the second biggest economy and one of the most populous countries in Europe, has a population of 65 million people of which near 17%[52] has more of sixty-five years old. French population ageing will be a slower process than in other countries in Europe, due to high fertility rate and to the low increase on the population aged 65 and over. Estimates from the French National Institute for Statistics and Economic Studies foresees that nearly one person in four will be aged 60 or over by 2015, and more than three in ten by 2035. In regards to the old dependency rate, statistics show a rate of near 26% in 2012[53] that has been increasing in the last years.

Although France has been resisting to the effects of the financial crisis that Europe is facing since 2008, the country Public Debt represented around 86% of GDP in 2011[54] and growth estimates are not very positive with rates near 0% for 2013 and 1% for 2014[55].

The French economy is mostly based on the services sector, although also industry has a relevant contribution for the overall GDP. France is one of the leading nations in ICT sector as some of the major players are located there, such as France Telecom, Capgemini, or ST Microelectronics. This sector contributed, in 2009, around 4% for the French GDP[56]. In 2008, the French ICT market accounted for 16% of the total European market; moreover, France is ranked second in the world for the proportion of science and technology graduates in the active population[57], reaching a rate of 45% in 2011[58].

Qualified workers in science and technology are also employed on sectors related to health and social services, reaching a rate of 12.5%[59] of total employment in 2008.

In 2012, Internet access was available in 80%[60] of households of which 89%[61] were high-speed connections. These rates confirm the investment made by the French government in promoting the growth of the digital economy in the country. Also, the percentage of internet users aged sixty-five or more, reached 30% in 2010[62]. Moreover, in 2011, 23%[63] of internet these users accessed the internet to look for health information (one of the higher rates in Europe), which reveals that the elderly population has been adopting ICT in their lives.

The interest on the promotion of a digital economy is confirmed clearly also by the investment in RandD activities, being equivalent to 2.25% of GDP in 2011[64]. There are several clusters in France created for supporting the development of economic activities within several sectors, namely ICT and Health, as those described next:

[52] EUROSTAT Database, Structural Indicators, Population on 1 January
[53] EUROSTAT Database, Structural Indicators, Old dependency ratio
[54] EUROSTAT Database, Government consolidated gross debt
[55] EUROSTAT Database, GDP and main components (forecast)
[56] EUROSTAT Database, Percentage of the ICT sector on GDP - Total (National Accounts)
[57] France's Sectors of Excellence, Key Figures 2008, retrieved from http://www.invest-in-france.org/Medias/Publications/233/TIC.pdf
[58] EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions
[59] EUROSTAT Database, Annual data on employment in technology and knowledge-intensive sectors at the national level
[60] EUROSTAT Database, Households - Level of Internet access
[61] EUROSTAT Database, Broadband and Connectivity – Households
[62] EUROSTAT Database, Internet activities – Individuals
[63] EUROSTAT Database, Internet activities – Individuals (Internet use: seeking health information)
[64] EUROSTAT Database, Total intramural RandD expenditure (GERD) by sectors of performance

- **Eurobiomed Biocluster Méditerranée** – created in 2009 as a non-for-profit organisation, its main objective is to promote the excellence of the academic and industrial healthcare research performed in South East of France, namely through the establishment of synergies between healthcare stakeholders such as companies, research centres and educational institutions. These synergies can boost the development of novel therapeutics, diagnostic tools, medical devices and healthcare services[65].
- **Medicen Paris Region** - Founded in 2005, this global competitiveness cluster aims to position the Paris Region (which includes Paris, Hauts-de-Seine, Seine-Saint-Denis, Val-de-Marne, Essonne, Yvelines and Val-d'Oise) as a European industrial leader in diagnostic and therapeutic innovation and leading-edge health technologies[66].
- **Systematic Paris Region Systems and ICT Cluster** – this cluster aims to raise Paris-Region at the international top level of the ICTs, particularly in the area of Software-Intensive Systems. Its activities have been creating synergies between SMEs, Large Companies, Research Laboratories and allows the emergence of innovative projects on the following areas: automotive and transport, free and open source software, digital trust and security, smart energy management, systems design and development tools, and telecoms[67].

2.6 Greece

With a total population of 11 million people, demographics data state that, in 2011, near of 19%[68] of the Greeks were aged sixty-five or more. This represents one of the highest rates in Europe regarding the elderly population. Moreover, the country presented, in 2012, an old age dependency ratio of 29.9%[69] which is also one of the highest rate registered in the European countries. This situation arise future challenges to Greece regarding the sustainability of the social security systems and employment, which are reinforced by a Public Debt of more than 170%[70] of the country's GDP, which continues to rise. According to estimates, the recovery of the GDP is foreseen for 2014 with 0.6%[71] of growth. Till then the prevision is of negative growth rates for country's economy.

The most important sector for the composition of the Greek GDP is the services sector, with the public sector playing an important part. As regards the Greek ICT sector, it is mainly focused on telecommunications, partially because of the establishment of big players in the country such as Nokia, Microsoft and Deutsche Telekom. These companies were able to find in Greece qualified human resources as 32.4%[72] of the active population, in 2011, had a Science and Technology background. In addition, the Greece's expenditure on RandD corresponded, in 2007, only to 0.6%[73] of the country's GDP, from which 10.8%[74] was invested in RandD for ICT (in 2005).

[65] http://www.eurobiomed.org
[66] http://www.medicen.org
[67] http://www.systematic-paris-region.org
[68] EUROSTAT Database, Structural Indicators, Population on 1 January
[69] EUROSTAT Database, Structural Indicators, Old dependency ratio
[70] EUROSTAT Database, Government consolidated gross debt
[71] EUROSTAT Database, GDP and main components (forecast)
[72] EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions
[73] EUROSTAT Database, Total intramural RandD expenditure (GERD) by sectors of performance
[74] EUROSTAT Database, RandD expenditure (BERD) of businesses in ICT sector as % of total RandD expenditure

Comparatively with the other countries in Europe, in 2010, Greece had one of the lowest rates regarding households with internet access (54%)[75]. Nevertheless, of the existing accesses 93%[76] were high-speed connections. Besides, when analyzing information about users, only 3% were aged sixty-five or more, and only 2% of these users accessed the internet for seeking information related to health issues.

In 2006, it was established the first organisation in Greece for the structured and systematic management and development of innovation clusters: **Corallia – Hellenic Technology Clusters Initiative**[77]. Corallia became the first systematic national cluster initiative, with the purpose of promoting competitiveness, entrepreneurship and innovation, in knowledge-intensive, exports-oriented and high-technology fields where Greece can attain a worldwide competitive advantage. This initiative has generated a cluster focused on **Nano/Microelectronics-based Systems and Applications (mi-Cluster)**[78] in which some of its one hundred and thirty members are developing services/products for the health area.

2.7 Hungary

According to EUROSTAT, in January 2013 Hungary's population amounted to almost 10 million people 16.9% of which were over 65, with an old-age dependency rate of 24.6%. Numbers that describe a phenomenon of ageing of the population (+1% of old people from 2007) that is still behind the overall European ageing trend[79].

Member of the EU since 2004 yet not a member of the Euro-group, in 2012 Hungary suffered greatly from the side-effects of the Euro-crisis with a drop of its GDP by 1.7%. Nevertheless, thanks to a huge effort by the government to cut costs and public deficit, resulting in a reduction of the public debt by 1.3% in 2012, Budapest is expected to bounce back with an estimated growth of 0.7% for 2013 that should become a more robust 1.8% in 2014[80], despite the soaring unemployment particularly high among young people (28.1%)[81].

More in detail, Hungary economy is strongly routed in services, which accounts for almost 2/3 of the country GDP, estimated to be roughly 98 billion Euros in 2013[82], and with a fairly strong cut coming from the ICT sector that amounts to 5.79% of GDP as of 2010[83]. At the same time, compared to other European economies, the percentage of population engaged in science and technology is still quite low, with 35%[84], and only 7% of those involved in health and social services (EU27 10%)[85].

However, progresses have been made in the past decade in infrastructures, especially regarding internet connectivity. If in 2005 only 22% of Hungarian households had internet access, in 2012 they

[75] EUROSTAT Database, Households - Level of Internet access
[76] EUROSTAT Database, Broadband and Connectivity – Households
[77] http://www.corallia.org
[78] http://www.corallia.org/en/innovation-clusters/mi-cluster-knowledge-base.html
[79] EUROSTAT Database, Structure Indicators, Population on 1st Jannuary; EUROSTAT Database, Structure Indicators, Old dependency ratio.
[80] EUROSTAT Database, GDP and Main Components; EUROSTAT Database, Government deficit/surplus, debt and associated data.
[81] EUROSTAT Database, Unemployment rate by sex and age groups – annual average.
[82] EUROSTAT Database, GDP and Main Components.
[83] EUROSTAT Database, Percentage of the ICT sector on GDP / Total (National Accounts).
[84] EUROSTAT Database, Employment in technology and knowledge-intensive sectors at the national level, by type of occupation.
[85] EUROSTAT Database, Employment in technology and knowledge-intensive sectors at the national level, by sex.

were up to 69%[86], the almost totality of which equipped with broadband connectivity (99%)[87].Regarding old age connectivity, instead, Hungary is still well behind the rest of Europe, with just 11% of its elderly population connected to Internet, and only 14% of those looking for health information[88].

Even more, although increased from the 0.94% registered in 2003, investments in R&D take up only 1.21% of the country's GDP, well below the EU average of 2.02% (EU28), thus limiting the growth of the knowledge-intensive-based sectors and ICT, with only 8.5% of the total public investments in R&D dedicated to the sector[89].

Nonetheless, the country can count on several high quality clusters boosting research and investments in critical ICT and Health-related sectors, such as:

- **PharmAgora Quality of Life Cluster** (previously Pharmapolis) - established in 2007 by 11 SMEs from the pharmacology and life science industries to cover a larger part of the pharmaceutical and health market, to be able to offer more complex services and to create a common platform that helps to strengthen market positions of the member companies. Efforts that earned the Cluster the **Accredited Innovation Cluster** title by the Hungarian Pole Programme Office as well as the **European Cluster Management Excellence label in BRONZE.**

  The most promising current running projects of the Cluster aim at such innovative areas as functional food products, nutritional supplements, drug combinations, corresponding instrument developments and clinical data management, biostatistics and comprehensive, rigorous quality assurance[90].

- **System Science Innovation Cluster - e**stablished in 2006, it was initiated by the Faculty of Informatics and developed INFO polis project innovation management of the Pannon University of Technology as an organization to contribute to the development of active research specialized in the specific sector of innovative companies, generation and implementation of innovative ideas for the incubation of start-up companies, deepening R&D&I cooperation and clusters of the University of Pannonia as well as external relations and R&D capacity development. Its main areas of expertise are: Information Security; Health Information Technology; Bio-Info-Nano Technologies; Logistics Information Technology Systems[91].

2.8 Italy

Italy has a population of over 60 million people of which 20% is aged over sixty-five[92]. The elderly population has been increasing in the past few years and it is anticipated to reach, in 2050, 33% of the population[93]. In addition, the old dependency ratio was of 30.9%[94] in 2011. Considering the

[86] EUROSTAT Database, Households - Level of Internet access.
[87] EUROSTAT Database, Households - Broadband and Connectivity.
[88] EUROSTAT Database, Internet activities – Individuals.
[89] Hungary: ICT R&D and participation to FP7.
https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/HU_FP7_0.pdf
[90] http://www.pharmagora.hu
[91] http://www.pannonpolus.hu/
[92] EUROSTAT Database, Structural Indicators, Population on 1 January
[93] United Nations (2009). World Population Ageing 2009. Department of Economic and Social Affairs, Population Division.
[94] EUROSTAT Database, Structural Indicators, Old dependency ratio

projected aging of the Italian population, it is expectable that also the old dependency ratio will raise and therefore it there will be an increasing number of potential beneficiaries of health and pensions. This scenario will represent future social and economic challenges for the country, which was forced to adopt, recently, austerity measures to tackle its Public Debt matching, in 2011, 120.7%[95] of the GDP.

In terms of infrastructures, in 2012, 63% of Italian households had internet access, which represents a good improvement related to 2002 when there were only 34%[96], but still below the average of the EU. The same regarding the type of connection used as only 85% of the households have a high-speed connection, while the EU average is of 91%[97]. When analyzing internet users aged sixty-five or over, in 2010, consisted in 9%[98] of Italian users; and only a very small fraction of these users (7% in 2011[99]) accessed the internet for seeking information related to health. Thus, Italian elderly population is still reluctant in using ICT and measures need to be undertaken to motivate these citizens to adopt new technologies as mean for a healthier aging process.

Regarding labour market, 32.9%[100] of the Italian active population has skills on Science and Technology. A part of them are employed in the Italian ICT sector, the fourth largest ICT market in Europe and one of the most advanced mobile communications market in the world. It is composed by 97.000 companies and 390.000 employees[101], which activity represented, in 2008, around 3.5%[102] of the Italian GDP. Moreover, since 2003, the expenditure on RandD has been corresponding to near 1%[103] of GDP, of which 9.6%[104] has been spent on RandD related to the ICT sector.

There are several organizations supporting the development of the Italian ICT sector, and some of those focus on promoting the improvement of ICT for Ageing and Health areas, as the following:

- **ICT Innovation Cluster (Polo ICT)** – managed by the Torino Wireless Foundation, the Polo ICT is a network of excellence that has more than 150 members, among companies, universities and research centres, and key players in supporting innovation in the ICT sector[105].
- **Etna Valley** – it is the Technological Cluster "Micro and Nanosystems" which aims at developing research, innovation and entrepreneurship capacities referring, among others, to the following areas optoelectronics, bioelectronics, biosensoristics and bioinformatics; molecular and organic photonics; and applications in ICT sector[106].
- **bioPmed Cluster** – it is an innovation cluster dedicated to bio and medical technologies, gathering about eighty companies, research centres and three academic institutions. This

[95] EUROSTAT Database, Government consolidated gross debt
[96] EUROSTAT Database, Households - Level of Internet access
[97] EUROSTAT Database, Broadband and Connectivity – Households
[98] EUROSTAT Database, Internet activities – Individuals
[99] EUROSTAT Database, Internet activities – Individuals (Internet use: seeking health information)
[100] EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions
[101] Invitalia's Inward Investment, Investment opportunities: ICT. Retrieved from http://www.invitalia.it/site/eng/home/investment-opportunities/ict.html
[102] EUROSTAT Database, Percentage of the ICT sector on GDP - Total (National Accounts)
[103] EUROSTAT Database, Total intramural RandD expenditure (GERD) by sectors of performance
[104] EUROSTAT Database, RandD expenditure (BERD) of businesses in ICT sector as % of total RandD expenditure
[105] http://www.poloinnovazioneict.org/
[106] http://www.etnavalley.com

cluster is led by the Bioindustry Park Silvano Fumero, a science and technology park founded in 1998[107].

2.9 Latvia

Latvian population has been gradually decreasing over the last decades and is currently around 2 million people. Its elderly population comprised, in 2011, 18.6% of the total number of inhabitants which was above the EU average (17.5%)[108]. This situation influences the old age dependency ratio that rose from 23.3% in 2003 to 27.7% in 2012, making it one of the highest in EU[109].

The access to the internet has been increasing significantly during the last years. In 2003, only 15% of Latvian households had internet access. This rate increased to 69% in 2012[110], and of these households, 94% had a high-speed connection[111]. Besides, the number of elderly users has been growing fast. In 2004, only 1% of the internet users were aged sixty-five or over; while in 2010 they constituted 10% of the overall users[112]. Moreover, 11% of elderly users accessed the internet for seeking information related to health[113].

Despite the ageing population, after an economic decline in 2008, Latvian economy is growing well above the EU's average registering an increase of 5.5% on its GDP, in 2011. Estimates indicate that the economy will continue to grow around 4%[114] in the next years. Also, the existing Public Debt is one of the lowest in Europe, corresponding to 42% of the Latvian GDP[115].

The Latvian ICT sector is composed by around 3000 companies employing near 25 000 persons. Most of the companies are of small dimension, which economy activity contributed, in 2007, for 4.2% of the country's GDP[116]. The percentage of active population with skills in Science and Technology was, in 2011, of 36.8%[117]; however due to a wave of emigration this rate has been decreasing as skilful human resources are leaving the country in the search of better professional opportunities.

On the other hand, Latvia is still lagging behind other EU countries in terms of investment on RandD with an expenditure of less than 1%[118] of its GDP allocated to RandD. As for the investment on RandD for the ICT sector it represented, in 2006, 1.5%[119] of the overall expenditure in this field, which is really small.

To promote synergies between ICT companies in Latvia in order to enhance their competitiveness, the **Latvian IT Cluster**[120] was established in 2007. It aggregates around twenty 20 leading enterprises working with information systems, as well as the University of Latvia and the Riga Technical

[107] http://www.biopmed.eu
[108] EUROSTAT Database, Structural Indicators, Population on 1 January
[109] EUROSTAT Database, Structural Indicators, Old dependency ratio
[110] EUROSTAT Database, Households - Level of Internet access
[111] EUROSTAT Database, Broadband and Connectivity – Households
[112] EUROSTAT Database, Internet activities – Individuals
[113] EUROSTAT Database, Internet activities – Individuals (Internet use: seeking health information)
[114] EUROSTAT Database, GDP and main components (forecast)
[115] EUROSTAT Database, Government consolidated gross debt
[116] ICT RTD Audit - Latvia, Prof. Imants Freibergs. "ICT Research capabilities in Latvia", November 2011. Retrieved from http://is.jrc.ec.europa.eu/pages/ISG/PREDICT/documents/Latvian-ICT-Budapest.pdf
[117] EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions
[118] EUROSTAT Database, Total intramural RandD expenditure (GERD) by sectors of performance
[119] EUROSTAT Database, RandD expenditure (BERD) of businesses in ICT sector as % of total RandD expenditure
[120] http://www.itbaltic.com

University. Recently, the IT Cluster with partners from Lithuania and Belarus created a cross-border Baltic IS cluster which by combining the potential of some 296 companies aims to compete with the U.S. and India. In addition, the **Latvian Information and Communications Technology Association (LIKTA)**[121] is a professional association, founded in 1998, that brings together more than eighty ICT product and service providers, educational institutions, as well as individual professional members of the Latvian ICT industry sector, namely in computer hardware and software, electronics, and telecommunications infrastructure and service providers.

2.10 Poland

With a population of 38 million people, Poland has one of the youngest societies in Europe, where only 13.8%[122] of people are aged sixty-five or over. This situation resulted also, in 2012, on a low old dependency rate of 19.4%[123].

Polish economy has been able to resist to the existing crisis in Europe. In this sense, its GDP grew near 4% in 2011[124] and forecasts indicate a continuing growth, even if in lower rates. In addition, the Public Debt represented, in 2011, 56.4%[125] of the country's GDP, which is below of many other EU countries and reflects the positive moment the Polish economy is living.

Although with a solid industrial sector, Polish economy is largely based on services. In 2009, the ICT sector contributed for 3%[126] of the Polish GDP, which shows the limited relevance of this sector for the country economy. According to the Polish Agency for Enterprise Development, there are currently 8 500 ICT companies which operations contributes with 4.8% of the Polish GDP, and estimates foresee it will rise to 9.5% in 2020[127]. These companies employ around employing 400 000 people. In the number of people qualified in Science and Technology has been increasing over the last years, corresponding to 35.3% of the active population in 2011[128], but still below the EU average (42%). Similar situation is visible concerning the investment on RandD activities as the expenditure in this area was, in 2011, still below 1% of the country's GDP[129].

Concerning access to the internet, Poland's situation has evolved positively over the years. In 2002, 11% of the households had internet access; however, in 2012, this rate increased to 70%[130], of which 91%[131] had a high-speed connection. Due to the age structure of the Polish society, when analyzing internet users, it is easier to understand a low rate of users aged sixty-five or over, which was of 9% in 2010[132]. In addition, the numbers on internet usage by individuals aged 65 or more are also relatively low, with only 9% of internet users representing the elderly population in 2010, and only 5% of elder citizens seeking health information on the internet. Also, seeking health related

[121] http://www.likta.lv
[122] EUROSTAT Database, Structural Indicators, Population on 1 January
[123] EUROSTAT Database, Structural Indicators, Old dependency ratio
[124] EUROSTAT Database, GDP and main components (forecast)
[125] EUROSTAT Database, Government consolidated gross debt
[126] EUROSTAT Database, Percentage of the ICT sector on GDP - Total (National Accounts)
[127] Polish Agency for Enterprise Development, Bożena Lublińska-Kasprzak, "ICT sector in Poland. The story of dynamic growth", CeBIT 2013. Retrieved from http://www.parp.gov.pl/files/74/101/614/615/15865.pdf
[128] EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions
[129] EUROSTAT Database, Total intramural RandD expenditure (GERD) by sectors of performance
[130] EUROSTAT Database, Households - Level of Internet access
[131] EUROSTAT Database, Broadband and Connectivity – Households
[132] EUROSTAT Database, Internet activities – Individuals

information on the internet was performed only by 6%[133] of the elderly users, which shows that this is not yet a favored mean for accessing information by this age group.

Synergies between stakeholders within the ICT sector are being boosted by different organizations, such as:

- **Wielkopolska ICT Cluster** – founded in 2008 by the Poznan Supercomputing and Networking Center (Polish Academy of Science), the Poznan City Hall and various ICT companies from the region, the clusters brings together over fifty companies, three research centres and a local government[134].
- **LifeScience Klaster Krakow** – a network of institutions from which agreed to collaborate in order to develop and deliver to the market innovations in the field of life sciences, comprising seventy entities from six areas of interest: Enterprises, Education, Institutes of Research and Development, Healthcare, Business environment, and Administration[135].
- **Eastern Poland IT Companies Cluster** – this association is coordinated by the IT Association in Podkarpacie and aims at contributing to the development of the Polish IT sector by supporting the implementation of joint investment enterprises, business cooperation, exchange of experiences, conducting IT and promotion campaigns[136].

2.11 Portugal

Similarly to other countries in Europe, the Portuguese population of 10 million people has been decreasing over the years, due to a decline in the birth rate, as well as to an increasing wave of emigration, namely of the young active population. Thus, in 2011, 19.1%[137] of the inhabitants in Portugal are aged sixty-five or over and the country has an old dependency ratio of near 30%[138], both rates are of the highest in Europe, which definitely will bring important challenges related to healthcare of elders and to the sustainability of the social security system.

Besides, Portugal is under the IMF/EU program for economical recovery through which several austerity measures are being taken with strong impact on the competitiveness of the economy and on the quality of life of the population. In 2011, the Public Debt reached 108.1%[139] of the GDP and estimates indicated it will have a negative growth until 2014.

The active population in Portugal has 25.5% of people qualified in Science and Technology fields, below the EU average, and many are leaving the country in the search of job opportunities and better work conditions. This situation can result in the lack of skilful people working in Portugal, who are necessary to leverage the current economic situation. In addition, the Portuguese economy is mainly based on the services sector, where the ICT sector comprises over 14 000 companies employing a total labour force of 79 000 people[140]. Regarding Portugal's expenditure on RandD in

[133] EUROSTAT Database, Internet activities – Individuals (Internet use: seeking health information)
[134] http://wklaster.pl
[135] http://lifescience.pl
[136] http://www.klasterit.pl
[137] EUROSTAT Database, Structural Indicators, Population on 1 January
[138] EUROSTAT Database, Structural Indicators, Old dependency ratio
[139] EUROSTAT Database, Government consolidated gross debt
[140] AICEP, Portuguese ICT. Retrieved from:
http://www.portugalglobal.pt/EN/InvestInPortugal/ProminentSectors/Sectors/Pages/PortugueseICT.aspx

percentage of GDP, in 2011, it was of 1.5%[141], the double of the overall investment on RandD made in 2003. The ICT sector was responsible for 3.1% of the RandD expenditure in 2007[142].

With regard to internet users, in 2010, 10%[143] of all users in Portugal were aged sixty-five or over, from which 9%[144] used the internet to find health related information. However, these rates are still below EU's average and campaigns need to be held to motivate elderly population to use further ICT. In addition, in 2011, near 60%[145] of the households had internet access, and although this ratio is below the EU's average, concerning the type of connection, 99%[146] of these households had a high-speed connection, one of the highest rated in EU.

The Portuguese Government launched in 2009 an initiative for the creation of clusters with the purpose of boosting innovation and qualification of various sectors, as well as of raising their visibility internationally. Considering ICT for Ageing area there are two relevant clusters:

- **Health Cluster Portugal** – is a private non-profit association supported by members from business, academia, hospitals and local authorities that aims to enhance the competitiveness of Portuguese products and services for health and the improvement of health care[147].
- **TICe.pt** – The Center for Information, Communication and Electronics Technologies (TICE.PT), was formally recognized by the Portuguese Government in August 2009. The technological and knowledge-related spheres underlying TICE.PT's areas of intervention are, among others, the following: wireless networks; ubiquitous multimedia communications; interface devices (sensors, actuators); and ontologies and engineering for domains of application clusters[148].

2.12 Romania

Romania has a population of 21 million people, of which almost 15%[149] are aged sixty-five or over. The existing old dependency ratio is of 21.5%, below EU's average (26.2%)[150]. The elderly population composed, in 2010, only 2% of the overall internet users in the country, which is one of the lowest rates in Europe and way below the EU's average (24%). In fact, only 54% of the Romanian households have access to the internet. Although it is a low rate comparatively with other European countries, it means a great increase in the national reality since, in 2003, only 6% of the households had internet access[151]. Regarding the type of connection, in 2011, 72% of the households with access to the internet, had a high-speed connection[152].

As in many other European countries, the financial crisis impacted negatively the Romania economy resulting, in 2009, on a negative growth of -6.6% in the GDP, which has been surpassed only in 2011, when GDP growth rate was of 2.2%. It is expected that GDP will continue to grow positively in the

[141] EUROSTAT Database, Total intramural RandD expenditure (GERD) by sectors of performance
[142] EUROSTAT Database, RandD expenditure (BERD) of businesses in ICT sector as % of total RandD expenditure
[143] EUROSTAT Database, Internet activities – Individuals
[144] EUROSTAT Database, Internet activities – Individuals (Internet use: seeking health information)
[145] EUROSTAT Database, Households - Level of Internet access
[146] EUROSTAT Database, Broadband and Connectivity – Households
[147] http://www.healthportugal.com
[148] http://www.tice.pt
[149] EUROSTAT Database, Structural Indicators, Population on 1 January
[150] EUROSTAT Database, Structural Indicators, Old dependency ratio
[151] EUROSTAT Database, Households - Level of Internet access
[152] EUROSTAT Database, Broadband and Connectivity – Households

forthcoming years[153]. Nevertheless, the Public Debt was of 33% of GDP, in 2011[154], which attest the economical recovery that is being achieved in the country.

Concerning the labour market, only 23.7% of the active population is qualified in Science and Technology. During the last decade the number of companies in the IT industry tripled to 11.000, as well as the number of employees estimated at 60.000 in 2010 only for the software segment[155].

Romania is still behind the majority of EU countries when referring to RandD expenditure. In 2011, the total investment on RandD was of less than 0.5% of the GDP[156]; which constitutes one of the lowest rates in Europe. Some organisations have been working to improve the competitiveness of the Romanian economy, namely through the generation of synergies among different economic actors and the promotion of RandD projects. Among these organisations, the following should be named:

- **West Region Romania** – it was established in 2011 as the association „Regional Cluster for Information and Communication Technology - West Region Romania", with the aim of promoting and supporting the regional ICT enterprises in becoming global market players, with their own products, under a strong regional brand[157].
- **Romanian Society of Medical Informatics (RSMI)** – created in 1990, RSMI has currently over one hundred members among physicians, computer scientists, engineers, mathematicians and other professionals working in the field of medical informatics. The aim of RSMI is to promote the activities in the development of medical informatics in Romania and to represent the activities in the country and abroad[158].

2.13 Spain

Demographic statistics show that Spanish population is increasing, with a population of 46 million people in 2012, corresponding to 5 million people more than in 2003. Regarding the elderly population, in 2012, it comprised 17.4%[159] of the population with an old dependency ratio of 25.8%[160]. With this situation and attending to the overwhelming unemployment rate of 25% (the highest in Europe), Spain will face in a near future important challenges related to the sustainability of its social security system.

In 2012, 68% of the Spanish households had internet access, of which 95% were made through a high-speed connection. Below EU's average, in 2010, internet was used by 12%[161] of the elderly population in Spain of which only 7%[162] used it to seek for health related information. In this sense, an effort has to be made at national level to raise the interest and increase the use of internet among the elderly population.

[153] EUROSTAT Database, GDP and main components (forecast)
[154] EUROSTAT Database, Government consolidated gross debt
[155] Technology Transfer Network for BSEC Region Project, "Romanian ICT Industry", retrieved from http://www.bsec-tech.com/eng/knowledge_hub/romania/ict_profile
[156] EUROSTAT Database, Total intramural RandD expenditure (GERD) by sectors of performance
[157] http://www.regiuneavest.ro
[158] http://medinfo.umft.ro
[159] EUROSTAT Database, Structural Indicators, Population on 1 January
[160] EUROSTAT Database, Structural Indicators, Old dependency ratio
[161] EUROSTAT Database, Internet activities – Individuals
[162] EUROSTAT Database, Internet activities – Individuals (Internet use: seeking health information)

Economically, Spain is undergoing a crisis reflected in the high rate of unemployed people and also on its Public Debt which reached 69% of the GDP in 2011[163]. Forecast indicates that GDP will continue to have a negative growth in the coming years, which can be aggravated by the decline of other European economies.

Even though the percentage of human resources in Science and Technology has been growing, 33.4% in 2003 and 38.8% in 2011[164], it is still relatively low when compared to economies of similar dimension within the EU. One of the sectors in which these human resources can find a job is the ICT sector, which constitutes one of the most relevant in Spain. This sector is composed mainly by SMEs, accounting for more than 450 000 direct jobs, and contributing around 5.8% for the Spanish GDP in 2010[165]. The Spanish expenditure on RandD is lower than in other EU countries corresponding, in 2011, to 1.3% of the GDP whereas EU's average was 2%. The investment of the ICT sector consisted in 3.3% of the overall expenditure on RandD made in 2007[166].

There are several organizations supporting the development of the Spanish ICT sector, and some of those focus on promoting the improvement of ICT for Ageing and Health areas, as the following:

- **Madrid Network** - it was created for the purpose of promoting innovation in the Community of Madrid and positioning its economy among those of the most advanced regions worldwide. It includes five science and technologic parks and twelve clusters, among which the "Madrid Platform for Health and Wellbeing Cluster", grouping together the major innovative companies in the Healthcare sector in Madrid, Research Centres, Service and Administration Companies and User Groups[167].
- **TicBioMed** – it is a cooperation platform for technology firms, health organisations, universities and other stakeholders involved in technological innovation applied to medicine, healthcare and biology in Murcia Region (Southeast Spain). The cluster aims to develop innovative interactions between health organisations and their suppliers, in order to align health needs to the services provided by ICT firms and university work groups[168].
- **ClusterTic** – established in 2008, the Barcelona Digital's ICT Cluster is an Association of Innovative Enterprises created as a meeting place and networking for start-ups, small and medium companies and other entities for the use of boosting the competitiveness of Catalan ICT sector. One of the areas in which ICT solutions have been introduced is the pharmaceutical sector, in which ICT allow the development of new models of prevention, diagnosis and treatment, and can optimize the planning and information management of the pharmaceutical and health environments[169].
- **BioCat** – this organization coordinates and promotes the biotechnology, biomedicine and medical technology sector in Catalonia, through synergies among stakeholders in this area and their initiatives to create an environment with a strong research system, active transfer of knowledge and an entrepreneurial business fabric. It comprises 520 companies, 440

[163] EUROSTAT Database, Government consolidated gross debt
[164] EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions
[165] Invest Spain, Sectors, ICT. Retrieved from: http://www.investinspain.org/icex/cda/controller/interes/0,5464,5322992_6261761_6279208_0,00.html
[166] EUROSTAT Database, RandD expenditure (BERD) of businesses in ICT sector as % of total RandD expenditure
[167] http://www.madridnetwork.org/en/red/salud
[168] http://www.ticbiomed.net/
[169] http://www.bdigital.org

research groups and 54 research centers, 10 universities which offer life sciences studies and 15 hospitals with noteworthy research activity[170].

2.14 Slovenia

Slovenia has a population of a little more than 2 million people, nearly 17% of which are age 65 or over, being among the European countries with the most pronounced ageing of population. Nevertheless, it has an old-age dependency ratio still below EU average, attested at 24.4%.

After years of surging economy, with annual growth rates at more than 5% (7% in 2007), since the outburst of the financial crisis in 2007/08 and following the 2009 Euro crisis, Slovenia saw its GDP collapse to less than 35 billions Euros in 2013 (with a loss of more than 2 billions from pre-crisis level) while the economy continue to struggle to recover with a – 2.5% GDP in 2012 and forecast of negative growth for both 2013 (-2.7) and 2014 (-1%). Moreover, the unemployment more than doubled in the last 5 years, reaching 8.9% in 2012 (20.6% among young people) and it is expected to increase in the following years, as well as the gross public debt, at 54.5% in 2012, it is expected to reach 63.2% in 2013 and 74% of GDP in 2015, according to the European Commission Directorate-General for Economic and Financial Affairs. Those figures have of course had a huge impact on the country's economic fundamentals, composed in large part by services, which employ over 60% of the workforce, industry and construction, which account for the remaining one-third of the employed population.

With only 35.2% of the workforce engaged in knowledge-intensive activities, Slovenia is among the worst in the EU, remaining even more behind when it comes to health and social services with just 5.8% employment in 2012 against an European average of 10.5%. A situation that reflects on the ICT sector that accounted for only 3.58% of the country's GDP in 2010, falling again behind the rest of Europe. However, the Slovenian Government is trying to put remedy to this situation by investing greatly in R&D, whose overall percentage of GDP has been constantly increasing in the past few years, from 1.45% in 2007 to 2.47% in 2011, with 14.3% of total public funding for R&D dedicated to ICT.

Regarding ICT infrastructure, with 74% of households connected to internet, Slovenia is slightly behind the EU average of 76%, though 99% of those are equipped with broadband access. On the other hand, concerning internet usage by the elder part of the population, the Slavic country has still much to do, with only 10% of people over-65 connected to internet and only 10% of those seeking information on health.

One of the organisations supporting the development of the Slavic ICT sector is the **ICT Technology Network (ICT TN)** which intends to become the promoter of co-operation for its members in the field of ICT in Slovenia and internationally. ICT TN is focused on particular fields such as telecommunication, broadband access and other communication equipment, communication services providers, the Internet of Things and the Future Internet, integrated steering and control systems, information solutions for business users, and cloud computing[171].

[170] http://www.biocat.cat
[171] http://www.ict-slovenia.net

2.15 Switzerland

One of the richest countries in the World, the Swiss Confederation[172] has 8 million inhabitants with a GDP per capita equal to 161 compared to EU28=100. With an increasing elderly population that comprises 17.2% of its citizens, largely due to long life expectancy, Switzerland has an old-age dependency ratio of 25.3%, in line with most European countries.

Able to quickly recover from the effects of the global financial crisis, the country has also been able to avoid most of the consequences of the European sovereign-debt crisis of 2009, managing to maintain stable its economy with GDP growth rates of 1.7% in 2011 and 1.8% in 2013, and only a slight decline in 2012 with just 1%[173].

One of the most advanced economies in Europe in fields related to science and technology, particularly in the areas of micro-technology, hi-tech, biotechnology and pharmaceuticals – with world-leading enterprises such as Novartis, just to mention one - Swiss economy can benefit from a highly qualified labour force performing highly skilled work. The service sector employs the greatest number of people, including banking and insurance know-how, while over 43% of the active population is engaged in knowledge-intensive activities[174]. Health and social services also account for 13% of the workforce[175].

On the other hand, in the past few years the ICT sector has become increasingly relevant during the 2000s, accounting for 5.1% of total GDP in 2011 (with a pick of 5.7% in 2002) with over 13000 enterprises employing more than 150000 people. A constant development that is largely due to growing public and private investments in R&D, roughly 2.1 billion Swiss Francs in 2013, of which 18% for ICT[176].

Regarding Internet connectivity, Switzerland can count on excellent infrastructures connecting more than 77% of households in 2010, 90% of witch with broadband access. The elderly population also is particularly interconnected compared to the majority of EU countries, with 45% of the over-65 using Internet, mostly for health purposes, although there are means for further improvement[177].

Furthermore, the country can benefit from several high-tech clusters working on ICT and health related issues that contribute to the overall quality of research and funding opportunities in those crucial sectors, by sharing knowledge and contacts among stakeholders, researchers and enterprises. Some of the most relevant Swiss networks are:

- **Medtech Switzerland** - the non-profit export platform for the medical technology industry initiated by the Swiss Federal Government and incorporated by Osec and the Medical Cluster in 2010 to promote the export of medical technologies to key world markets. The mission of Medtech Switzerland is to serve the industry, especially Swiss SMEs, by facilitating export activities to new and existing foreign markets. In particular, Medtech Switzerland supports

[172] *Note: Some of the data collected for Switzerland is not from EUROSTAT Database, as in for the other countries, therefore any comparison must take into account the different source of the data quoted*

[173] EUROSTAT Database, GDP and Main Components.

[174] EUROSTAT Database, Employment in technology and knowledge-intensive sectors at the national level, by type of occupation.

[175] EUROSTAT Database, Employment in technology and knowledge-intensive sectors at the national level, by sex.

[176] Swiss Confederation Federal Statistical Office FSO - Information and Communication Technologies (ICT) in Switzerland.

[177] Swiss Confederation Federal Statistical Office FSO - Omnibus 2010 Survey: Internet in households in Switzerland.

the Swiss medtech industry. As a company grows, one of the main challenges they might face is achieving successful entry into foreign markets[178].

- **The Medical Cluster** - a network of Swiss manufacturers, suppliers, service providers, and research and development institutions along the value-added chain of medical technology. The Cluster strives to improve the innovation environment for the medical technology industry in Switzerland by listening to the needs of the industry and addressing those by providing value adding services. It also provides platforms like events, conferences and forums for the medical technology industry and improve the interconnectivity between all stakeholders in the medical technology industry in Switzerland. The Medical Cluster cultivates a distinct culture of cooperation with our members and partners for a better understanding of the industry, its opportunities and its challenges[179].
- **Alp ICT Cluster** - fosters synergies between Western Switzerland's ICT business community and those organisations which can provide a range of support services to the ICT sector, whether on a national or international level. To achieve this, Alp ICT acts as a partner linking business, R&D, financial and political players with a view to creating economic value. Hence its motto "Powering business innovation". It targets businesses with a potential to develop into international players.To achieve its goal of stimulating the economic dynamism of the ICT sector in Western Switzerland, Alp ICT's mission is threefold: to develop synergies between the local players in the ICT sector, in particular with a view to developing new know-how; to support the expansion of local ICT actors on the international market; and to profile Western Switzerland as a key player in the digital world[180].

2.16 United Kingdom

The population of UK has been increasing gradually in the past few years, growing from 61.5 million in 2008 to more than 63.7 millions in 2013, mostly thanks to immigration. The elderly population in 2012 accounted for 16.9% of the total number of the British subjects, while the old-dependency ratio passed from 24.1% in 2007 to 25.7%, 1 point below the EU average (26.7%)[181].

After a downfall to a mere 0.1% GDP growth in 2012 following the European sovereign debt crisis, British economy has started to recover under the push of the financial and banking services and it is expected to grow by 1.3% in 2013 and 2.2% in 2014[182], although public debt remains high at 88.7%[183] and unemployment among young people rests around 20% (below EU average, but still high to guarantee a sustainable growth), almost three times the overall national unemployment average (7.9%)[184].

Nevertheless, despite the recent difficulties, UK's GDP in 2013 reached almost pre 2007/2008 crisis levels, at roughly 2.04 Billion Euros (2.08 billions, in 2007). Services are the main component of the

[178] http://www.medtech-switzerland.com/
[179] http://medical-cluster.ch/de/
[180] http://www.alpict.com/en/
[181] EUROSTAT Database, Structure Indicators, Population on 1st Jannuary; EUROSTAT Database, Structure Indicators, Old dependency ratio.
[182] EUROSTAT Database, GDP and Main Components.
[183] EUROSTAT Database, Government deficit/surplus, debt and associated data.
[184] EUROSTAT Database, Unemployment rate by sex and age groups – annual average.

British economy, accounting for 78% of GDP, with one of the biggest cut coming from the financial services industry of the City of London that often contends to New York the place for largest financial centre in the World[185].

The UK's ICT sector is one of the largest in Europe comprising more than 116.000 companies and accounting for more than 5.85% of GDP[186]. A position that is strengthened by a large part of the population, more than 48%, working in fields related to science and technology[187] (13% in health and social services[188]) and the highest number of ICT graduates in the whole of Western Europe.

Moreover, the total R&D investments in UK in 2012 were around 34,243 millions Euros (1,7% of GDP), second only to Germany and France in absolute terms. Of those, more than 3,800M Euros were invested in ICT R&D[189].

As well as in the rest of ICT based services, UK is also one of the leading countries in Europe for internet infrastructures with nearly 80% of all households connected to internet[190]. In particular, huge investments have been made to upgrade the existing line bringing the broadband access to 99%, when it was still 91% in 2010[191]. The elderly population also benefitted from the government effort to connect all citizens to internet, with 41% of over-65 surfing online in 2010 against an EU average of 24%. Among these "aged" internet users, more than half, 21%, were looking for health related information[192].

Among the organizations based in UK engaged in promoting and supporting further enhancements in ICT and health, several can be considered at the top of European research, such as:

- **Health ClusterNet** - an independent non-profit health R&D organisation legally established in the United Kingdom to answer the challenges of the health system in the new economic and financial climate on the basis of economic recovery, social cohesion and the goals of EU2020. In particular, the cluster has 2 main goals: (i) to shift from hospital-centric care models to more patient focused service networks supporting active and healthy ageing, and (ii) to better align investment and spending decisions with sustainable regional development goals. For both, it is the added value principle that will shape strategic and sustainable change for health systems. In this context, HCN works with partners and stakeholders on a needs-led basis to help close the gap between what it is known know and what is needed to do in 3 ways: (i) knowledge development (ii) knowledge brokering (iii) technical support[193].
- **Staffordshire BIC** - is part of a European network of over 160 organisations which assist businesses and individuals to evaluate and develop inventions, innovations and technology related issues. It helps inventors, entrepreneurs and SMEs by providing advice on new product and new business ideas, through the provision of seminars and workshops to encourage innovation and New Product Development, by sourcing UK and European grants

[185] EUROSTAT Database, GDP and Main Components.
[186] EUROSTAT Database, Percentage of the ICT sector on GDP / Total (National Accounts).
[187] EUROSTAT Database, Employment in technology and knowledge-intensive sectors at the national level, by type of occupation.
[188] EUROSTAT Database, Employment in technology and knowledge-intensive sectors at the national level, by sex.
[189] The United Kingdom: ICT R&D and participation to FP7. https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/UK_FP7_0.pdf
[190] EUROSTAT Database, Households - Level of Internet access.
[191] EUROSTAT Database, Households - Broadband and Connectivity.
[192] EUROSTAT Database, Internet activities – Individuals.
[193] http://healthclusternet.eu/

for funding and innovation and through the provision of incubation workspace and grow on accommodation combined with on-site business facilities, advice and support. Its main policy areas of expertise are: Publicity Policy; Health & Safety Policy; Equal Opportunities Policy; and Privacy[194].

[194] http://www.thebic.co.uk/

3 Market Barriers

Barriers are those factors that limit and hamper the diffusion and commercialization of new products or services in a given economical market. The ICT for Ageing solutions market is in an early stage of development. Thus, entrepreneurs and organisations willing to deploy new products or services in this field need to overcome the existing barriers in order to be able to succeed in this emergent market.

Stakeholders and interested players in this market have been discussing potential strategies to tackle the recognized market barriers that include the following:

- Limited knowledge concerning users needs;
- Insufficient awareness of market opportunities;
- Low level of interoperability of products/services;
- Lack of common standards within the various EU countries;
- Undefined business and financing models.

These main barriers identified will be described in the next sections.

3.1 Limited knowledge concerning users needs

Besides the elderly population, the users of products and services of the ICT for Ageing market include also the care givers and the solutions providers. To ensure the successful exploitation and deployment of ICT for Ageing products and services, a clear understand of the needs of all these users are fundamental.

The CAPSIL Roadmap[195] indicates several studies that confirm the adoption of a new IT product or service is firmly linked to the user's perception about the benefits he/she will gain by acquiring or using that IT product or service. Other factors that are relevant for user's acceptance are related to comfort, i.e., if the product consists on a familiar device (or the service is provided by one) it is easier to be accepted by users; and to the language adopted to describe or provide the service, which should be tailored to the users profile.

When the needs of the users are not taken into consideration during the development of a product or a service, the successful exploitation might be in risk. If the older adult is not able to use a device or to understand how a service works, this situation can increase *their sense of frustration and dependency*[196]. On the other hand, as highlighted by the SWOT Analysis formulated by the FORSEE partnership[197], *failure to engage with people in health management roles in charge of implementing new systems is also a significant barrier* for the uptake of ICT products and services for Ageing.

[195] International Support of a Common Awareness and Knowledge Platform for Studying and Enabling Independent Living.
[196] European Commission (2007) Ageing well in the Information Society, An i2010 Initiative: Action Plan on Information and Communication Technologies and Ageing, SEC(2007)811
[197] SWOT Analysis on the theme "ICT for Health". 2012

In this sense, when designing and developing a new product or service for this sector and for these users, the solutions providers need to be aware of the factors that can influence its adoption and commercialization. These factors include socio-economic aspects, *gender needs and income levels that may impede access to ICT, personal attitudes and sensitivities to ICT, and even of lifestyles*[198].

One of the available strategies to tackle this market barrier consists on the adoption on **user-centered approaches** for the development of new products or services. Instead of a list of requirements defined by the solution provider, the product or service is designed according to the user's attitudes and behaviours, who will be collaborating by giving feedback and inputs during the development phase, which will result in a more user-friendly and satisfying final product/service.

3.2 Insufficient awareness of market opportunities

This market barrier refers to the lack of visibility of existing players and technologies among ICT industry, intermediaries and final users. This situation can contribute for the low adoption of products and solutions addressing the elderly population, and for the inexistence of higher collaboration between ICT solutions providers.

Besides improving communication efforts at the time of launching a new product or service, it is necessary to invest further on user empowerment. This strategy requires a strong effort on informing users (e.g. older adults, caregivers, health institutions) about the available products and services, with a special emphasis on how this product/service can enhance their daily routine, personal health and quality of life. By being aware of the advantages of these solutions, users will be curious and willing to discover this market and what it has to offer, which can leverage its competitiveness.

On the supply side, insufficient awareness about existing solutions and competitors can lead to an uncertain environment to implement investments in research and technological development addressing the ICT for Ageing market. In addition, generally, in Europe every university, research center, SME, and solution provider makes its own way, which causes the wheel to be reinvented again and again. This is one of the effects of fragmentation of the market at national, regional and local levels that constrain the development of the ICT for Ageing market.

3.3 Low level of interoperability of products/services

Interoperability, according to the norm ISO/IEC 2382-01, is defined as "*the capability to communicate, execute programs, or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units*"[199].

The relevance of this feature for the ICT for Ageing products and services is due to the fragmentation of the European market. The eHealth Taskforce report "Accelerating the Development of the eHealth

[198] Idem.
[199] Information Technology Vocabulary, Fundamental Terms

Market in Europe"[200] refers that each country has its own ICT for Ageing market with specific operation conditions and needs, which limits the possibility of generating economies of scale for ICT for Ageing solution providers, resulting in higher costs for introduce a new product/service on the market and to make it available in different international markets. Besides responding to national markets differences, the ICT for Ageing products and services, to be fully adopted and sustainable, need to allow integration with other products/services and connection between different organisations (e.g. hospitals, laboratories) to enhance healthcare. Thus, interoperability is one of the major barriers to be overcome in the coming years.

In addition, the e-Health market in Europe, like several other markets of innovations, suffers also from the fragmentation of public demand which in turn leads to a lack of exchangeability of products and services. The setting of different requirements by individual buyers at local, regional and national levels, the limited cooperation between procurers and between procurers and suppliers to develop solutions applicable across different member States are major barriers[201].

3.4 Lack of common standards within the various EU countries

Defining standardization criteria for ICT solutions for Health and Ageing is difficult. One of the reasons is the multiplicity of technologies that comprise the offer within the ICT for Ageing market, which can integrate different standards according to its features (e.g. data protection, software, security). As such, creating common standards for this field need to address all the existing requirements for the different features an ICT solution for Ageing can have.

According to the ITU-T Technology Watch Report "E-health Standards and Interoperability" (2012), *unless a critical mass of healthcare technology providers adheres to the same standards for electronic health records, the system will not provide the anticipated cost efficiencies and healthcare quality improvements*. In this sense, it is essential to foster a closer relationship and cooperation among the solutions providers, as well as other relevant stakeholders (especially health professionals to ensure their needs are met), to allow an open dialogue and joint definition of the standards to be accepted and adopted by the whole supply chain of the ICT for Ageing market. Public authorities can play a key role in this "negotiation" by leading the discussion and deciding on policies to boost these synergies and reach a common agreement on the necessary standards.

Overcoming this barrier will contribute positively to surpass the interoperability challenge mentioned above.

3.5 Undefined business and financing models

Business models intend to support organisations in their commercial efforts and to ensure a return of investment. In the Ageing sector, defining a business model is a more challenging task as the

[200] European Commission, 2007
[201] FORSEE Partnership, 2012. SWOT Analysis on the theme "ICT for Health"

objectives are related to health and ageing processes that include various factors (e.g. social factors) that are not very easy to measure or foresee. In addition, identifying a funding source for ICT solutions for Ageing is still demanding, as due to low awareness of the market opportunities private financial mechanism are not yet willing to invest in a product/service that does not present clear economical advantages.

This market barrier has been a subject of many projects and studies due to its relevance for Europe. The TechnoIAGE Study[202] intended to assess the current situation regarding business and financing models for existing innovative ICT solutions for ageing well and to disseminate the lessons learned from a set of selected cases studies. One the findings of the study is related to geographical differences that influences the way the ICT for Ageing market operates, dividing Europe in three "types" of market:

- Formal: mainly Anglo Saxon and Scandinavian regions, where the markets are more formal and stable, but also innovative. The technology is mainly user-driven, specialised and advanced.
- Informal: in which the market is more traditional and not yet mature. Technology is usually "one-size-fits-all". This type of market encompasses the Mediterranean and Eastern Europe regions.
- Mix of both types above: including mainly Continental regions.

According to the final report on "Business Models for eHealth" produced by Rand Europe and Capgemini Consulting[203], besides a strong knowledge of the market and users, *there is a need for public policy actions supporting the development of value-creating business models for eHealth.* Nevertheless, these policies will only be efficient and successful if all the relevant stakeholders (e.g. national healthcare authorities, research centres, industry) are involved to provide and share experiences.

[202] TechnoIAGE website: www.technolage.org
[203] European Commission, DG Information Society and Media, 2010

4 Mapping of public and private funds

4.1 European funding opportunities

Horizon 2020[204] is the new European Funding programme for research and innovation, and it aims at supporting the Europe 2020 Strategy in promoting a smart, sustainable and inclusive growth. This program merges, under a single initiative, three previously separated programmes, thus handling all forms of innovation from research to market (Figure 1).

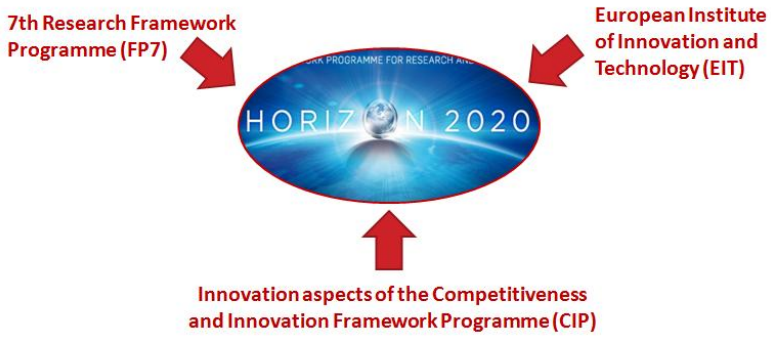

Figure 1 – Horizon 2020

With a planned budget of 77028 million Euros, Horizon 2020 is build around 3 pillars: Excellence in Science (focused on research activities and all related infrastructure); Industrial leadership (for promoting job creation and company's development) and Societal Challenges (addressing the improvement of quality of life and sustainability).

Focusing on the purposes of the **Ageing***Well* Network, the area of the programme, which can represent a higher interest for the network' stakeholders, is the "Health, Demographic Change and Wellbeing" work programme (WP) under the pillar of the Societal Challenges. This WP aims to keep older people active and independent for longer and supports the development of new, safer and more effective interventions. A call on "Personalising health and care" intends to support research and innovation activities that might contribute to:

- improve our understanding of the causes and mechanisms underlying health, healthy ageing and disease;
- improve our ability to monitor health and to prevent, detect, treat and manage disease;
- support older persons to remain active and healthy;
- and test and demonstrate new models and tools for health and care delivery.

4.2 National funding opportunities

In most countries in Europe, governments are now finalising their strategic plans with investment priorities that will determine the main areas for using structural funds for the period 2014-2020. Thus, at the moment of the production of this document, little information is available on national

[204] http://ec.europa.eu/programmes/horizon2020/

public funding programmes available and on-going in the countries of the members of the networks. In this sense, the following sections present existing private initiatives for funding ideas and projects within the ICT and Ageing fields, as well as venture capital firms and business angels that can support companies and entrepreneurs in financing their ideas and projects.

4.2.1 Austria

AT: net | Austrian Electronic Network

https://www.ffg.at/program/atnet

AT:net is a programme of the Federal Ministry for Transport, Innovation and Technology (BMVIT) managed by FFG. It provides funding for individual applicants or consortia introducing information and communication solutions (services and applications) of public interest using broadband technology. The thematic fields range from innovative access technologies, e-Government, **e-Health** and e-Learning through to confidence and security.

GEN-AU | Austrian Genome Research Programme

http://www.gen-au.at

The GEN-AU programme focuses above all upon medical issues and provides funding for projects that advance Austrian research in the field of genomic research. In some projects, scientists are studying the role played by genes in both a healthy subject and a person suffering from cancer. The new proteomics platform APP is working on ultra-sensitive methods to identify the properties of genes and proteins, and on chip-based diagnostics. Another project is tackling the problem of obesity by trying to discover and explain the function of the genes and proteins that are involved in the absorption of lipids (fats) by cells. However, GEN-AU's activities are not limited to funding research. The programme also aims at achieving market-relevant research results in cooperation with the private sector.

ECOS | ECOS Private Equity

http://www.ecosventure.com

ECOS provides equity capital in the form of a majority or even minority shareholdings. Its investments focus on sustainable and profitable business segments - ideally with further growth potential, an international business as well as skilled and dedicated employees. Its primary target for investment strategy is SMEs in the DACH region, from all sectors, with revenue of EUR 5 million and sustainable earnings.

4.2.2 Belgium

BRAIN-be | Belgian Research Action through Interdisciplinary Networks

www.belspo.be

The Council of Ministers has approved on the 5th of October 2012 the first phase of the research programme BRAIN-be (2012-2018). Open to the whole Belgian scientific community, including

universities, public scientific institutions and non-profit research centres, this programme comprises six thematic areas, namely: Ecosystems, biodiversity, life sciences; Geo-systems, universe and climate; Cultural, historical and scientific heritage; Public strategies; **Major societal challenges**; and Management of collections. Funding is available for two types of research projects:

- Partnership projects up to four years, and
- Pioneer projects up to two years.

The thematic area related to **Major societal challenges** *is based on major societal challenges and relates to an array of important concerns for individuals and society such as demographic changes, democracy, migration, safety, poverty, sustainable development, health and environment, globalisation, and multiculturalism*[205]. One of the challenges the BRAIN-be programme aims to tackle is concerning **Health, Well-Being and Ageing.**

SME – Innovation Projects

www.iwt.be

IWT, the government agency for Innovation by Science and Technology in the Flemish Region, has a funding programme available for projects, run by **SME**, aiming at the development of **innovative products, processes and services**: "*Kmo-innovatieprojecten*"[206]. The selected projects have to bring innovation into the SME and can consist on the development of a completely new or a significantly innovative product, process or service with clear impact on the business.

WIST 2

http://recherche-technologie.wallonie.be/fr/menu/themes/tic/le-programme-wist-2.html

The Walloon Government has established priority areas for the development and future growth of the region. One of the key areas is related to ICT, which is seen as of transversal importance for all the other areas. In this sense, the investment in this area is fundamental for the differentiation of companies in the region and for enhancing their competitiveness. Projects funded by WIST 2[207] need to target the acquisition and development of knowledge in the field of ICT skills which Walloon companies can rely to develop products, processes or new or substantially improved services. Within the targeted technology areas, two are directly related to Ageing Well: Integrated biomedical information for better health; and Signal processing for biomedical applications.

Capricorn Venture Partners

http://www.capricorn.be

Capricorn Venture Partners is an independent pan-European venture capital and asset manager seeking to invest in technology based growth companies. Capricorn's dedicated investment teams

[205] Belspo website, Call for proposals: http://www.belspo.be/belspo/organisation/Call/forms/Brain2012/BRAIN-be_dosinfo_E_call2012%20pioneer.pdf
[206] IWT website: http://www.iwt.be/programma/kmo-programma
[207] Gateway to Research and Technologies in Wallonia, Accueil / Thèmes / TIC / Le programme Wist 2 - Wallonie - Information - Société - Technologies: http://recherche-technologie.wallonie.be/fr/menu/themes/tic/le-programme-wist-2.html

are composed of experienced investment managers with deep technology expertise and a broad industrial experience. Capricorn is investing out of the venture capital funds Capricorn Health-tech Fund (focusing on human health-technology investments, such as health-technologies relate to the prevention, the diagnosis and the treatment of diseases) and Capricorn ICT Fund (which objective is to identify technologies and fund innovative companies that make a difference to the lives of people worldwide).

4.2.3 Bulgaria

Bulgarian Business Angels Network (BBAN)
http://bban.eu
The main role of BBAN is to bridge the existing capital divide by linking entrepreneurs with investors and assisting VC funding of start-ups, pre-seed and seed seeking projects and companies in the early stages of their development.

4.2.4 Cyprus

Cyprus Business Angels Network (CyBAN)

http://cyban.com.cy

The only Angel Investment Network in Cyprus, CyBAN connects innovating fast growth companies to equity finance through our membership of experienced angel investors. The investment on innovative ideas and projects can be of between 25000 Euros and 500000 Euros.

4.2.5 France

Research Programmes of the National Agency for Research (NAR)

http://www.agence-nationale-recherche.fr/programmes-de-recherche

The NAR has six thematic funding programmes aiming at fostering and strengthening French research and bringing together enterprises, higher education institutions and research centres for the implementation of RandD projects. From the available programmes, two are particularly interesting for the stakeholders involved in ICT for Ageing:

- Biologie Santé (Health Biology): this programme funds research projects in biology and biomedical disciplines. It comprises a sub-programme specifically designed to encourage research projects between academia and businesses in the field of Technologies for Health:
    - TecSan (*Technologies pour la santé et l'autonomie*)[208]: Its general objective consists on the promotion of innovative applied technologies and methodologies for health and independent living. This purpose will be achieved through three axes: 1) development of breakthrough or disruptive technologies (instrumentation and

[208] NAR, Research Programmes, Technologies pour la santé et l'autonomie: http://www.agence-nationale-recherche.fr/programmes-de-recherche/biologie-sante/technologies-pour-la-sante-et-l-autonomie-tecsan

biosensors, medical imaging, CAMI, biomaterials and tissue engineering, medical devices), 2) e-Health and medical information, and 3) development of innovative technologies and services for rehabilitation, correction or replacement functional disabilities.

- Sciences et Technologies de l'Information et de la Communication (Science and ICT): this programme intends to improve an area of research with high added value and high potential growth in France. It includes four axes: 1) INFRA - development of future broadband communications infrastructure, high performance computing, high-capacity storage, components / optics / advanced treatments necessary to achieve these infrastructures and innovative services, 2) INS - methods and software tools for engineering services and digital systems, embedded systems, and security and trust of information systems, 3) CONTINT - production and exchange of content and knowledge (create, edit, search, interface, use, economy, confidence, enhanced reality, social networks, Future Internet), associated services and robotics, 4) *Modèles numériques* - the development of a "digital double" by the modelling and simulation of the physical world, objects, services and interactions, and human behaviour.

4.2.6 Germany

Evonik Industries

http://corporate.evonik.com

Evonik, the creative industrial group from Germany, is one of the world leaders in specialty chemicals. Its activities focus on the key megatrends health, nutrition, resource efficiency and globalization. Profitable growth and sustained increase in the value of the company is on the heart of Evonik's corporate strategy. Evonik Corporate Venturing plans to invest a total of up to €100 million in Europe, the U.S. and Asia over the medium term in highly promising start-ups and leading specialist venture capital funds. Evonik is active in over 100 countries around the world. In fiscal 2011 more than 33,000 employees generated sales of around €14.5 billion and an operating profit (EBITDA) of about €2.8 billion

High-Tech Gründerfonds

http://www.high-tech-gruenderfonds.de

High-Tech Gruenderfonds invests in young, high potential high-tech start-ups. The seed financing provided is designed to enable start-ups to take an idea through prototyping and to market launch. Typically, High-Tech Gruenderfonds invests EUR 500,000 in the seed stage, with the potential for up to a total of EUR 2 million per portfolio / company in follow-on financing. Investors in this public/private partnership include the Federal Ministry of Economics and Technology, the KfW Banking Group, as well as thirteen industrial groups of ALTANA, BASF, B. Braun, Robert Bosch, CEWE Color, Daimler, Deutsche Post DHL, Deutsche Telekom, Evonik, Qiagen, RWE Innogy, Tengelmann and Carl Zeiss. High-Tech Gruenderfonds has about EUR 563 million under management in two funds.

Sirius Venture Partners GmbH

http://www.sirius-venture.com

Sirius Venture Partners GmbH, headquartered in Wiesbaden and Düsseldorf, is a venture capital company focusing on technological growth markets. It concentrates on venture capital investments in companies from seed to early expansion phases with an outstanding growth potential through innovative technologies, products and business models. The group currently manages a portfolio of twenty companies in four funds. Sirius Venture Partners supports its portfolio companies in their strategic planning with its long lasting experience as entrepreneur and financier on an international scale.

4.2.7 Greece

Attica Ventures

http://www.attica-ventures.com

Attica Ventures aims to invest in innovative small and medium enterprises (SMEs) that are in their development phase, hold a distinctive competitive advantage and have excellent potential for equity appreciation and international competitiveness and presence, regardless of the industry they compete. Our target size of investment is between € 3-7 million, but we are able to accommodate any size of investment in cooperation to strategic partners and/or co-investors. In most of the cases we intend to take minority stakes, supporting the management achieving their goals.

Hellenic Venture Capital & Private Equity Association

http://en.hvca.gr

The Hellenic Venture Capital & Private Equity association was established on September 2003, as a professional non-profit organization, aiming at promoting and developing the activities of venture capital funds, examining issues of common interest concerning its members as well as protecting their business interests. The association's members are 18 companies who are all engaged in Greek Venture Capital industry.

Thermi Ventures S.A.

http://www.thermi-ventures.com

It holds a highly experienced and cohesive management team, proven and successful operational and assessment procedures, significant capital commitment and the will to add value not only to its investors' committed capital, but also to its portfolio Companies.

4.2.8 Hungary

HVCA | Hungarian Venture Capital and Private Equity Association

http://www.hvca.hu

HVCA is known as one of the most dynamic and active professional organisations in the CEE region. The HVCA represents virtually every major player of the private equity and venture capital industry in Hungary and is dedicated to promoting the private equity and venture capital industry for the benefit of funds, entrepreneurs, private equity professionals and the economy as a whole.

Venture Finance Hungary Plc

http://mvzrt.hu

Venture Finance Hungary Plc is the coordinator of a program is designed to improve the financial status of Hungarian SMEs by providing early-stage equity financing. It may acquire a stake of up to 70% of a Joint Fund at any given time while the fund exists, and its contribution to any given fund ranges between HUF 700 million to HUF 5 billion.

4.2.9 Italy

AIFI | Italian Private Equity and Venture Capital Association

http://www.aifi.it

The Association is an organization composed of different entities which, throughout direct investment of their own funds or through the management and advisory of independent funds (closed-end funds) are private equity and venture capital investors with the objective of purchasing, managing and divesting in unquoted companies.

FILAS | Financial Investment Agency of Regione Lazio

http://www.filas.it

Filas' mission is to guide the economy of Lazio and promote development and innovation, especially through the adoption of new technologies. Filas manages tools related to innovation, new technologies and the net economy in order to strengthen the competitiveness of regional SMEs both in terms of regional product growth and external investment

4.2.10 Latvia

LVCA | Latvian private equity and venture capital association

http://www.lvca.lv

To promote the development of venture capital sector in Latvia, six biggest companies that operate in venture capital sector in Latvia – “Baltcap Management Latvia”, “EKO Investors”, “Hanseatic Capital Latvia”, “NCH Advisors INC”, “Norvēģijas-Latvijas uzņēmējdarbības attīstības fonds” and “Small Enterprise Assistance Funds”, as well as “Latvian Development Agency” have founded public organization “Latvian private equity and venture capital association” (LVCA).

Baltcap Management Latvia

http://www.baltcap.com

BaltCap is the leading dedicated private equity and venture capital investor in the Baltic States (Estonia, Latvia and Lithuania). It invests in companies with exceptional growth potential and provides them necessary tools in achieving the targets. It acts as a professional owner working closely with the management and other shareholder.

4.2.11 Poland

ADIUVO Investment Fund

http://www.kfk.org.pl/en/news/sppw/adiuvo-new-polish-biotechnological-fund

ADIUVO is a private Polish fund that aims to screen and evaluate innovative ideas in the field of **biotechnology and medical devices** developed in the Polish research institutes and universities. It has near 9.5 million Euros for financing projects at early development stage and grounded on innovative technology that could be protected with a patent in the future.

Business Angel Seedfund Sp. z o.o. S.K.A.

http://www.seedfund.pl

Business Angel Seedfund (BAS) is a first seed capital investment fund established by business angels in Poland, established in 2007 by entrepreneurs which succeed establishing their own businesses from the beginning. BAS cooperates with different organisations similarly engaged in investment entertainments and is supported by Polish Agency for Enterprise Development) as one of the seed capital funds.

Fundusz Mikro

http://www.funduszmikro.pl

Fundusz Mikro is a microfinance institution. It was established in 1994 by the Polish American Enterprise Fund (PAEF) to promote the development of microenterprises in Poland. For this purpose USD 20 million were allocated. They decided to make available capital in the form of loans to those among micro business owners, who could use it in the most efficient way. Thanks to this approach many more microbusinesses now have the possibility of financing their growth.

Guild of Business Angels

http://www.aniolybiznesu.org

The Guild of Business Angels is an organisation which finds innovative ideas for business or companies in early stages of development and matches them with their business angels. It aids private investors in undertaking investments in innovative enterprises by finding them on the market and preparing the business angels themselves to the investment process.

Lewiatan Business Angels

http://www.lba.pl

One of the largest and most active Business Angels network in Poland, established in 2005 with the use of EU funds under the brand of Polish Confederation of Private Employers Lewiatan. LBA matches entrepreneurs who have innovative ideas and ambitious development plans with private investors.

4.2.12 Portugal

Critical Ventures

http://critical-ventures.com

Critical Ventures will be looking at fulfilling an equity gap - seed and early stage technology based projects with a global reach. A significant number of projects in the ICT arena remain unfunded due to difficulties in assessing the technological content. Its main areas of investment focus on Information & Communication Technology (ICT) market and on a requiring seed capital or early stage funding up to 1M€ per company.

Portugal Ventures

http://www.portugalventures.pt

It is a Venture Capital and Private Equity firm, focusing its investments in innovative, scientific and technology-based companies as well as in companies from the more traditional Portuguese Tourism and Industrial sectors, with significant competitive advantages and export oriented to global markets.

Research Projects Support Funds from the Foundation for Science and Technology (FCT)

http://www.fct.pt

FCT aims to promote the advancement of scientific and technological knowledge in Portugal in any scientific or technological domain. Also, it intends to contribute for its diffusion to improve education, **health**, environment, and the **quality of life and well being** of the general public. In this sense, FCT support financially research projects through calls for applications in any scientific area which open every year and calls targeted at specific themes or domains.

4.2.13 Romania

Oresa Ventures Romania

http://www.oresaventures.com

ORESA Ventures is an investment company with Swedish roots, historically focused on private equity investments in Central & Eastern Europa. Its current core market is Romania. Main sectors of interest include healthcare, FMCG, financial & business services, retail and construction materials. As an

investment company, ORESA provides capital as well as strategic and operational support to companies with the ambition to become leaders in their sectors, and headed by entrepreneurs and management teams with vision and drive.

TechAngels | Romanian Business Angel Network

http://techangels.ro

TechAngels aims at facilitating the development of tech businesses from South-Eastern Europe through investment, expertise and connections. It helps entrepreneurs shape up their pitch deck, evaluate their business and put them in contact with the most fitted investors from the network.

Venture Connect

http://www.ventureconnect.ro

VentureConnect, an initiative of Biris Goran, is an unparalleled project aimed at facilitating investors' direct contact with local IT/Internet/Technology entrepreneurs who have already established successful ventures requiring additional substantial investments.

4.2.14 Spain

National Plan for RandD+I 2013 – 2016

http://www.idi.mineco.gob.es/

The objectives of the National Plan are to contribute to place the Spanish Science and Technology System in a leading international position, by enhancing capabilities and knowledge, as well as by boosting the competitiveness and innovation of industrial sector. In order to accomplish these objectives, four national funding programmes were defined: 1) National program for promoting talent and employability in RandD+I, 2) National program for promoting scientific and technical excellence, 3) National program for the business competitiveness in RandD+I, and 4) National program of RandD+I for tackling societal challenges.

The "National program for promoting scientific and technical excellence" intends to fund joint projects aiming at generating scientific and technological knowledge, namely concerning emerging technologies. It integrates four sub-programmes, of which the National sub-program for the development of **emerging technologies** needs to be stressed due to its liaison with ICT. This sub-programme fund RandD projects aiming at developing breakthrough and disruptive technologies, and addressing exploitation measures for the market uptake of these technologies. As such, projects focused on the development of technologies for health and ageing might be funded by this sub-programme.

In addition, the "National program for the business competitiveness in RandD+I" supports the development and exploitation of Enabling Technologies as considered in "Horizon 2020", such as photonics, micro and nanoelectronics, nanotechnologies, advanced materials, **biotechnology, ICT,**

etc. This can be achieved through the promotion of projects addressing the development of an individual technology, or considering the combination of several of these technologies. Also, this sub-programme foresees the subvention for projects aiming at integrating technologies in existing companies as a way of promoting innovation and competitiveness.

Finally, the "National program of RandD+I for tackling societal challenges" aims to contribute for strengthen the relation between academia and business, and to find solutions for the societal challenges Europe is currently facing, through the financial support to RandD+I projects. Considering the challenge related to Active and Healthy Ageing, the priorities established under this sub-programme include, among other, are the following:

- Omic and medical imaging technologies for a more personalized medical care, based on the individual rather than on the disease;
- Robotics and nanotechnology as diagnostic instruments and treatment processes;
- Use and diffusion of ICT as a backbone for a more global e-Health on the development of research activities and on the organisation and management of the National Health System.

4.2.15 Slovenia

Business Angels of Slovenia

http://www.poslovniangeli.si

Business Angels of Slovenia is the first and largest private formal club business angels, and constitutes the first angel fund in the country. It combines than 40 of the most successful Slovenian businessmen, on the basis of syndication in addition to capital companies filed their knowledge, experience and social capital. Since 2011, it manages a fund of 5.4 million Euros to support ambitious undertakings that will contribute to economic growth in Slovenia and to create new jobs.

4.2.16 Switzerland

CTI | Commission for Technology and Innovation

http://www.kti.admin.ch

CTI's objective is to generate more innovative products and services by encouraging higher education institutions and companies to work together on joint R&D projects. Each year, CTI supports several hundred of these joint R&D projects. CTI only funds services provided by higher education institutions. This funding is used to pay the salaries of around 1000 researchers each year. CTI provides grant funding for innovative R&D projects for all scientific disciplines. For organisational purposes, these are grouped together under the following four areas of funding: Life Sciences - Leading Research for Better Quality of Life; Micro and Nanotechnology: Ever smaller, ever more sophisticated; Engineering Sciences: Integration and Innovation; Enabling Sciences: Stronger Economic Pacesetters.

The Swiss National Science Foundation (SNSF)

http://www.snf.ch

The Swiss National Science Foundation (SNSF) offers a wide range of research funding schemes which are open to scientists and academics of any nationality working in Switzerland. With few exceptions (mainly research programmes), the topics and scope of the research can be defined by the researchers themselves. The funding programmes of the SNSF are funding schemes whose basic parameters are pre-defined. These parameters may be of a thematic or conceptual/organisational nature. Some of the SNSF's programmes were suggested by researchers and their home institutions, while others were established by political actors.

4.2.17 United Kingdom

The Invention for Innovation (i4i) Programme

http://www.ccf.nihr.ac.uk/i4i

i4i aims to support and advance the research and development of innovative healthcare technologies and their translation into the clinical environment for the benefit of patients through: 1) guided progression of innovative medical product prototypes, and; 2) provision of business advice to the medical technology professionals it funds. i4i supports projects through prototype and commercial development to introduction and adoption in the Nation Institute for Health Research.

On Month 36, a third version of this Guidelines Handbook will be produced and it will include information on the future funding programmes defined at national level for the period 2014-2020.

5 References

- **Ageing***Well* Annex 1 Description of Work
- AICEP, Portuguese ICT. Retrieved from: http://www.portugalglobal.pt/EN/InvestInPortugal/ProminentSectors/Sectors/Pages/PortugueseICT.aspx
- European Commission (2009), Monitoring foresight activities in Europe and the rest of the world, EFMN Final Report.
- EUROSTAT Database, Annual data on employment in technology and knowledge-intensive sectors at the national level
- EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions
- EUROSTAT Database, Broadband and Connectivity – Households
- EUROSTAT Database, GDP and main components (forecast)
- EUROSTAT Database, Government consolidated gross debt
- EUROSTAT Database, Households - Level of Internet access
- EUROSTAT Database, Internet activities – Individuals
- EUROSTAT Database, Internet activities – Individuals (Internet use: seeking health information)
- EUROSTAT Database, Internet activities – Individuals (Internet use: seeking health
- EUROSTAT Database, Percentage of the ICT sector on GDP - Total (National Accounts)
- EUROSTAT Database, RandD expenditure (BERD) of businesses in ICT sector as % of total RandD expenditure
- EUROSTAT Database, Structural Indicators, Old dependency ratio
- EUROSTAT Database, Structural Indicators, Population on 1 January
- EUROSTAT Database, Total intramural RandD expenditure (GERD) by sectors of performance
- France's Sectors of Excellence, Key Figures 2008, retrieved from http://www.invest-in-france.org/Medias/Publications/233/TIC.pdf
- ICT RTD Audit - Latvia, Prof. Imants Freibergs. “ICT Research capabilities in Latvia”, November 2011. Retrieved from http://is.jrc.ec.europa.eu/pages/ISG/PREDICT/documents/Latvian-ICT-Budapest.pdf
- Industrial Innovation, eHealth. Retrieved from: http://ec.europa.eu/enterprise/policies/innovation/policy/lead-market-initiative/ehealth/index_en.htm
- Invest Spain, Sectors, ICT. Retrieved from: http://www.investinspain.org/icex/cda/controller/interes/0,5464,5322992_6261761_6279208_0,00.html
- Invitalia's Inward Investment, Investment opportunities: ICT. Retrieved from http://www.invitalia.it/site/eng/home/investment-opportunities/ict.html

- Polish Agency for Enterprise Development, Bożena Lublińska-Kasprzak, "ICT sector in Poland. The story of dynamic growth", CeBIT 2013. Retrieved from http://www.parp.gov.pl/files/74/101/614/615/15865.pdf
- Technology Transfer Network for BSEC Region Project, "Romanian ICT Industry", retrieved from http://www.bsec-tech.com/eng/knowledge_hub/romania/ict_profile
- The 2012 Predict Report - An Analysis of ICT RandD in the EU and Beyond. Joint Research Centre Scientific and Policy Reports, 2012.
- The European Union Explained: Europe 2020: Europe's Growth Strategy. December 2012.
- United Nations (2009). World Population Ageing 2009. Department of Economic and Social Affairs, Population Division.