Political Roadmap

"Promoting the adoption of telemedicine services

in the Central Europe area"

Prepared by the SPES project (Support Patients through E-services Solutions[1])

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The Roadmap is mainly based on the findings, results and contributions achieved during the Strategic Political Committee´s meetings and on the findings of a questionnaire of the SPES partners.

This document does not represent in any way the position of the European Commission, nor the Central Europe Programme or other public bodies funding the SPES project or involved in the process of modernisation of the health system in Europe.

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1. Introduction

ICT/assistive technologies such as e-Health, Telemedicine or AAL solutions can contribute to an improved quality of life for people in need of care, with chronic diseases or with physical or mental health restrictions. But AAL will also gain importance due to demographic and social changes.

Ageing is one of the greatest social and economic challenges of the 21st century for European societies. Statistical data show that during the coming decades it will be difficult to care for all old people in Europe if the existing health care processes and costs remain the same. This is highlighted by the ratio between working people and older people, which is expected to be one working person for one senior citizen by the year 2050 (cf. Gaßner/Conrad 2010).

In addition, an increase in one- and two-person households can be observed. Single persons will particularly benefit from technologies, which promote independent living (cf. Fachinger et al. 2012). In the search for new solutions for meeting the rising need for care, assistive technologies can make an essential contribution.

Assistive technologies support can enable sick, disabled or older persons to fully participate in society and to master their home situation. They have the potential to provide individual solutions and thereby meet individual needs and to improve living standards. In addition, they can reduce high expenses for health and care services and open up new business opportunities (cf. Gaßner/Conrad 2010; Fachinger et al. 2012).

The development of home-based ICT support systems is regarded as a particularly innovative means of promoting independent living. "Intelligent" homes, digital and web-based services aim at enabling people in need of care to live independently. The efficiency of service delivery, however, is connected to the identification of users' specific needs (cf. AGE Platform Europe 2011).

2. The Project SPES

2.1 Short description of the project

"Support Patients through E-Service Solutions (SPES)" aims at transferring the positive approach and results achieved in the e-Health sector to four cities in the Central Europe Area.

The project is focused on 4 different pilots in 4 different local contexts, which are: Ferrara (Italy) for respiratory problems, Vienna (Austria) for dementia, Brno (Czech Republic) for people with different abilities and Kosice (Slovakia) for social exclusion.

The SPES project wants to implement a technology platform, connected to different medical devices and installed at patients' home, thus creating both a line with medical care providers or with other patients and a system able to monitor the patients' health status or to provide help to people by, for example, suggesting things to do.

On the other side, SPES wants to create a positive cooperation between regional forerunners and stakeholders, international partners and decision makers to improve the awareness of e-Health, telemedicine and AAL solutions that are already available.

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2.2   Project consortium

o   ENEA – (Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile), project leader, Bologna, Italy

o   Provincia di Ferrara, Italy

o   Azienda Unità Sanitaria Locale di Ferrara, Italy

o   CUP 2000, Italy

o   Fonds Soziales Wien, Vienna, Austria

o   University of Vienna (until 09-2013), Vienna, Austria

o   Wiener Sozialdienste (since 10-2013 in place of the University of Vienna), Vienna, Austria

o   Mesto Košice, Slovakia

o   Technická univerzita v Košiciach, Košice, Slovakia

o   Czech Technical University in Prague (CVUT), Prague, Czech Republic

o   Pro DEEP o.s., Brno, Czech Republic

o   CETIC (Centre d'Excellence en Technologies de l'Information et de la Communication) Charleroi, Belgium

2.3   Definition of terms

Assistive technologies are designed to meet the needs of sick, disabled or older people, which can be subsumed in the following categories: (1) staying at home as long as possible, (2) maintaining and promoting independence, (3) better quality of life and participation, (4) improvement of safety/security and living comfort (5) better handling of chronic diseases and (6) promotion of mobility and communication.

The existing assistive technologies can be differentiated along three generations. (cf. Fachinger et al. 2012)

1st Generation: not connected devices with one-dimensional functionality, which neither require data exchange nor are bound to services, such as glucometers, wheeled walkers, mobile phones for older persons

2nd Generation: connected devices without interactivity, which transmit data to service providers, such as emergency systems or telemonitoring devices for the transmission of vital parameters

3rd Generation: connected devices (Ambient Intelligence) including the integration of technologies in the environment, such as automatic regulation of light or hotplates.

At the first Strategic Political Committee Meeting (20th April, 2012 in Vienna) three important concepts that are relevant for the SPES project (e-Health, Telemedicine, and Ambient Assisted Living (AAL) were discussed and the following common definitions were agreed:

• **E-Health** – covers aspects related to the storage of the medical data in an electronic way (normally these data are obtained from machinery equipments that are able to provide electronic version of the exams);

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• **Telemedicine** – covers aspects of reducing distances between patient and medical personnel. It works well in specific contexts like small ships in navigation, little emergencies or first aid/suggestions;

• **Ambient Assisted Living (AAL)** – covers the aspect of making the house, and in general the places where the patients live, a better place, more comfortable and responsive.
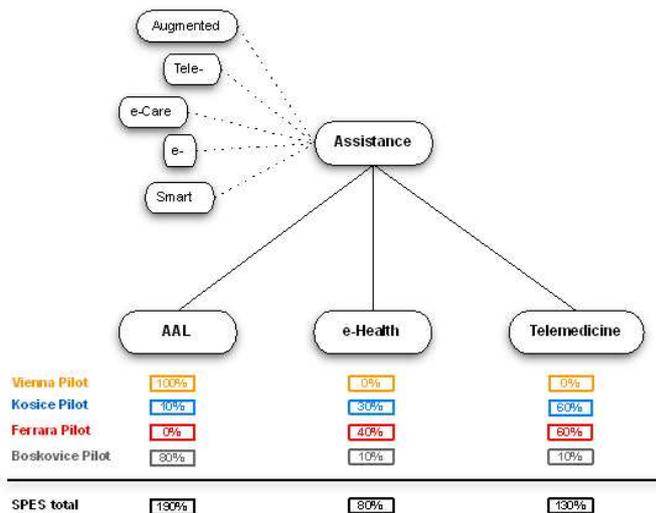
3.   Ageing society in Europe / Central Europe - Demographic change

"The age structure of the EU population is projected to change dramatically." (European Commission 2012:28) While older people are projected to account for an increasing share of the population by 2060, the middle of the age pyramid becomes smaller during the projection period due to low fertility rates. Consequently, the shape of the population pyramid gradually changes into a pillar. Following the projection, the proportion of young people (0-14 years) will remain rather stable (around 14%), while the share of those aged 15-64 will decline from 67% to 56% of the population. In 2060, persons aged 65 and over will become a much larger share (rising from 17% to 30%); those aged 80 and over (rising from 5% to 12%) will be almost as numerous as the young population. While the population aged 65 and above will almost double, the number of people aged 80 years and above will almost triple from 2010 to 2060.

As a result of these trends, the old-age dependency ratio – people aged 65 or above relative to those aged 15-64 – in the EU is projected to double (increasing from 26% to 52.5%) This implies that there will be only two working-age people for every person aged over 65 years. The increase in the total age-dependency ratio – people aged 14 and below and aged 65 and above over the population aged 15-64 – is projected to be even larger in 2060 (rising from 49.3% to 77.9%). There are, however, significant differences between the individual EU Member States.
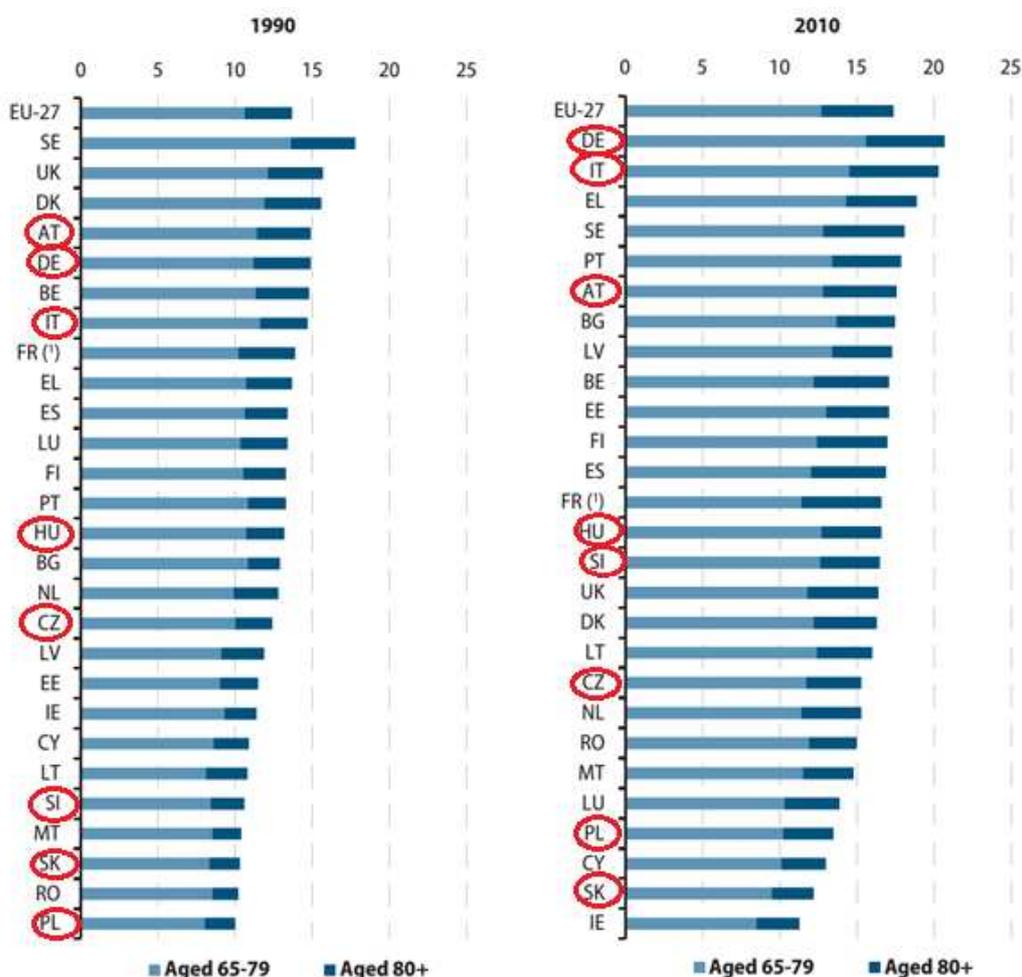
In the following, the demographic change in the European Union in the past from 1990 to 2010 is presented as well as the projections until 2060, with a focus on people aged 65 or above and 80 or above. This first section is followed by statistical data on health problems and limitations in daily activities. Subsequently, specific population data is provided concerning the countries of the Central Europe region regarding life expectancy and healthy life years of older persons. In addition, the past and projected development of the population aged 65 or above and 80 or above as well as the old-age-ratios of the different countries are compared. In the last section, the population numbers and structure indicators for 2010 and 2030 are presented for the four regions of the SPES project (regions in Austria, Czech Republic, Italy and Slovakia).

3.1. Older population in the European Union

As highlighted in figure 1, the relative importance of older persons in the total population has increased in all EU member states from 1990 until 2010, however, at different degrees. In particular, the share of those aged 80 or above has grown. The countries of the Central European region are marked in red. In Italy, for example, the share of all persons aged 65 or above (including those aged 80+) has increased from almost 15% in 1990 to over 20% in 2010. (The same is true for Germany.) The increase is also observable in the three other SPES regions with a relative importance of the older people in 2010 of around 18% in Austria, over 15% in Czech Republic and around 12% in Slovakia.

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Figure 1 Relative importance of older persons in the total population on 1 January

Source: European Union, 2011 (Eurostat online data code: demo_pjanind)

The projections for 2020 to 2060 show that in the EU-27, the share of those aged 50-64 will increase to slightly over 20% in 2020 and then decrease until 2060. The number of people aged 65-80 will rise to over 15% of the population in 2030, remaining rather stable until 2060. According to the projections, those aged over 80 will steadily increase from around 5% in 2010 to over 10% in 2060. In 2060, the share of people aged 50 or over will be over 45% in total (compared to a little more than 35% in 2010).

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Figure 2 Projected structure of the population by age group, EU-27, 1 January
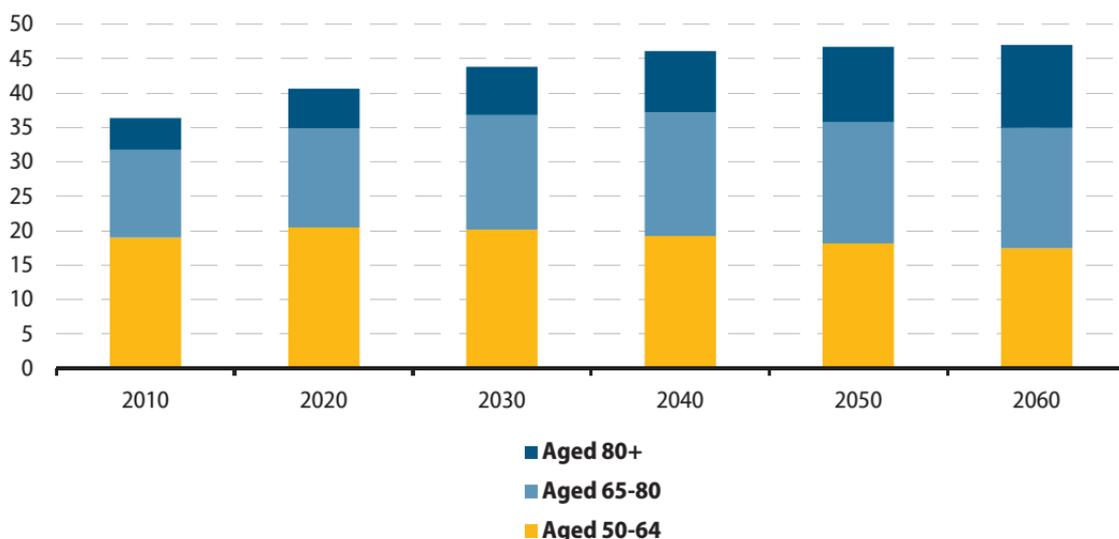
Source: European Union, 2011 (Eurostat online data code: proj_10c2150p)

In the EU-27 from 1990 until 2010, the proportion of women among the population has decreased both in the group of those aged 65-79 and those aged 80 or over. Women's share, however, remains higher than those of men. In 2010, around 55% of all persons aged 65-79 were women and around 65% of those aged 80 or over. The proportion of women in the population aged 50-64 largely stayed the same in this period.

Figure 3 Proportion of women among the population, various age groups, EU-27 (in %)
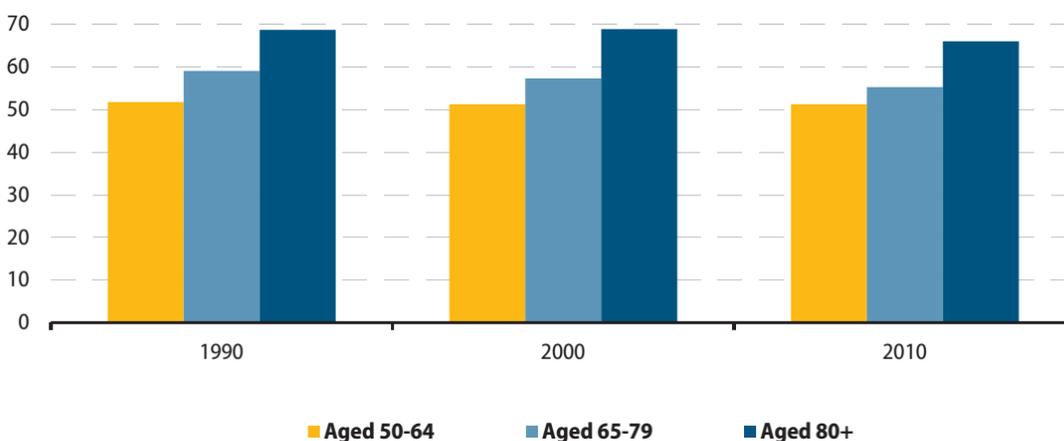
Source: European Union, 2011 (Eurostat online data code: demo_pjangroup)

Figure 4 shows the projected difference between the number of women and the number of men by age group in the EU-27 (in millions). While there is a plus of women of over 2 million in the age group 50-64 in 2010, this is projected to steadily decrease to a minus of less than one million in 2060. Similarly, the gender difference in the group of people aged 65-80 will decrease from over 6 million in 2010 to almost 3 million in 2060. In contrast, the difference is projected to rise in the age

group 80+, leading to a plus of women of over 10 million in 2060 (compared to over 7 million in 2010).

Figure 4 Projected difference between the number of women and the number of men by age group, EU-27, 1 January (number of women - number of men, millions)
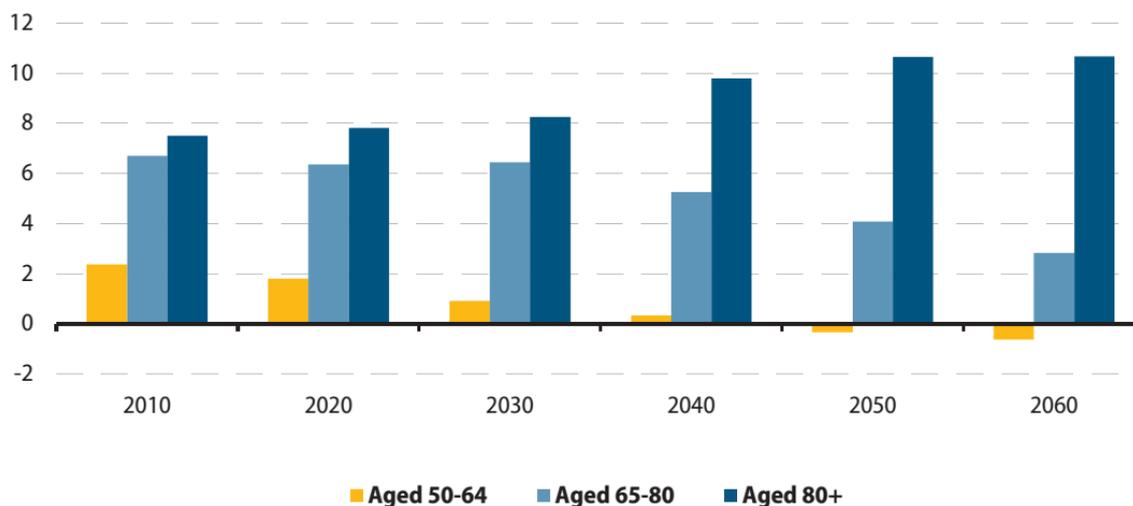
Source: European Union, 2011 (Eurostat online data code: proj_10c2150p)

3.2 Health problems and limitations

Following figure 5, in the EU the proportion of people having a long-standing illness or health problem has slightly decreased for those aged 65-74, while it has increased in the age groups 75-84 and 85+. Over 60% of those aged 75-84 and almost 70% of people aged 80 or over were affected of health problems in 2009 (compared to 30% of those aged 16 and over).

Figure 5 Proportion of people having a long-standing illness or health problem, EU (in %)
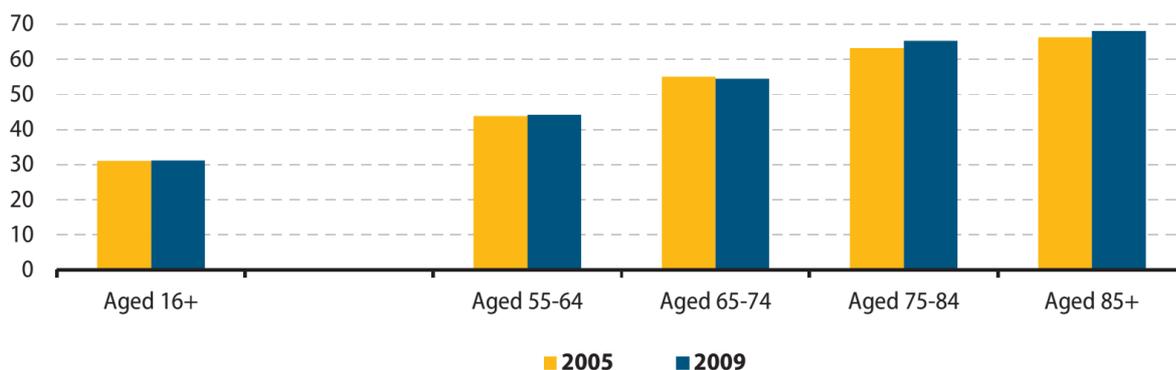
Source: European Union, 2011 (Eurostat online data code: hlth_silc_05)

The following figure illustrates that the proportion of people with self‑perceived limitations in daily activities differs most significantly by gender in the age groups 75-84 and 85+. While the

perceived limitations of males aged 15+ and aged 55-64 are higher than those of women, women have higher limitation perceptions in the population aged 65-74. In the age group 75-84, more men perceive themselves limited or strongly limited and less men perceived themselves not limited compared to women. For those aged 85+ a similar trend can be observed, with more women regarding themselves as strongly limited (almost 40%) and fewer women as not limited (over 20%) compared to men.

Figure 6 Proportion of people with self -perceived limitations in daily activities (activity restriction for at least the past 6 months), EU -27, 2009 (in %)

Source: European Union, 2011 (Eurostat online data code: hlth_silc_07)

3.3 Demographic change in Central Europe: the population of older people

The following table provides an overview of the population structure in the countries of Central Europe in 2010. These include Austria, Czech Republic, Germany, Hungary, Italy, Poland, Slovenia and Slovakia. The Czech Republic and Poland have the highest shares of people aged 55-64 (both 20.8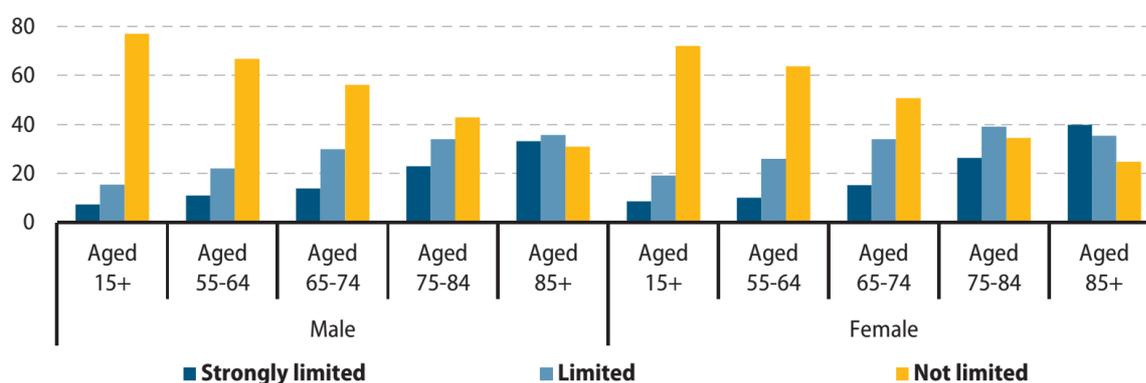% of the total population), followed by Hungary and Slovenia (both 20.3%). The lowest percentages of people in this age group are found in Austria (18.4%). Gender differences are most significant in Hungary with 1.6% more women than men.

The greatest share of people aged 65-79 can be found in Germany with 15.6% and Italy with 14.5% of the total population, followed by Austria (12.8%), Czech Republic (12.7%) and Slovenia (12.6%). Slovakia has the smallest share of those aged 65-79 with 9.5% of the total population. The women outnumber the men in all countries in this age group; the biggest differences are registered in Hungary (2.9% more women), Poland (2%) and Slovakia (2%).

Regarding the age group 80+, Italy (5.8%) and Germany (5.1%) also have the highest numbers. Austria (4.8%), Hungary and Slovenia (both 3.9%) have the next biggest shares of people aged 80 or over. Slovakia ranks lowest with 2.7% of the total population. Also in this age group there are more women than men, with the most significant differences observed in Germany (1.9% more women), Austria and Italy (both 1.8%).

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Table 1 Population on 1 January 2010

	Total population (in thousand)	Aged 50-64 (% of total population)			Aged 65-79 (% of total population)			Aged 80+ (% of total population)		
		Total	Male	Female	Total	Male	Female	Total	Male	Female
EU-27	501 101.8	19.1	9.3	9.8	12.7	5.7	7.0	4.7	1.6	3.1
AT	8 375.3	18.4	9.0	9.3	12.8	5.8	7.0	4.8	1.5	3.3
CZ	10 506.8	20.8	10.1	10.7	12.7	5.0	6.7	3.6	1.1	2.4
DE	81 802.3	19.3	9.6	9.7	15.6	7.2	8.4	5.1	1.6	3.5
HU	10 014.3	20.3	9.4	11.0	12.7	4.9	7.8	3.9	1.2	2.8
IT	60 340.3	19.0	9.2	9.7	14.5	6.5	7.9	5.8	2.0	3.8
PL	38 167.3	20.8	9.8	10.9	10.2	4.1	6.1	3.3	1.0	2.3
SI	2 047.0	20.3	10.3	10.1	12.6	5.4	7.2	3.9	1.1	2.8
SK	5 424.9	19.5	9.3	10.2	9.5	3.8	5.8	2.7	0.8	1.9

Source: own production based on Eurostat online data code demo_pjangroup)

Figure 7 Percentage of women in the population, 2010
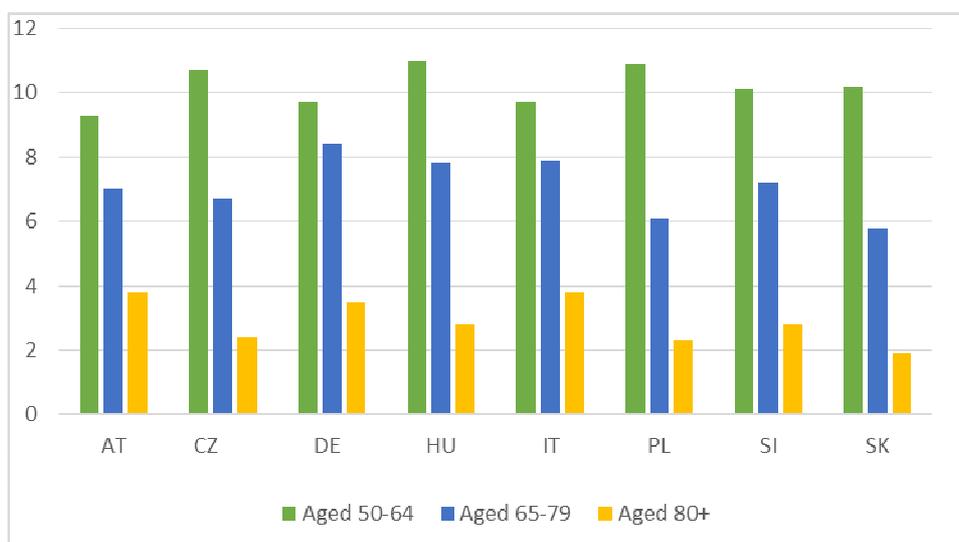
Source: own production based on Eurostat online data code demo_pjangroup

The extract from the above table illustrates the percentage of women in the population in the different age groups (figure 7). The Czech Republic, Hungary and Poland have the highest percentage of women in the age group 50-64 (around 11%). Concerning the women aged 65-79, Germany has the highest share with over 8%. In Austria and Italy (almost 4%), the rate of women aged 80 or over is around double as high as in Slovakia (under 2%).

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Table 2 Life expectancy and healthy life years of older persons, 2011

	Life expectancy in absolute value at 65 (years)		Healthy life years in absolute value at 65 (years)		Healthy life years at age 65 as a proportion of life expectancy at age 65 (%)	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
AT	18,1	21,7	8,3	8,3	45,9	38,2
CZ	15,6	19,2	8,4	8,7	53,8	45,3
DE	18,2	21,2	6,7	7,3	36,8	34,4
HU	14,3	18,3	6	6	42,0	32,8
IT	18,8	22,6	8,1	7	43,1	31,0
PL	15,4	19,9	7,6	8,3	49,4	41,7
SI	16,9	21,1	6,2	6,9	36,7	32,7
SK	14,5	18,4	3,5	2,9	24,1	15,8

Source: own production based on Eurostat online data code: hlth_hlye

The life expectancy at age 65 is higher for women in all countries of Central Europe (see Table 2). In 2011, life expectancy at 65 was highest for women in Italy (22.6 years), followed by Austria (21.7 yrs), Germany (21.2 yrs) and Slovenia (21.2 yrs). For men, it was also highest in Italy (18.8 yrs), followed by Germany (18.2 yrs) and Austria (18.1 yrs). The lowest life expectancy at age 65 for both men and women was registered in Hungary (14.3 and 18.3 years respectively) and Slovakia (14.5 and 18.3 yrs).

Concerning healthy life years at age 65, there are differences in the countries with regard to the distribution between men and women. While women have more healthy life years at 65 in Czech Republic, Germany, Poland and Slovenia, men have more healthy life years in Italy and Slovakia. Men and women have an equal amount of healthy life years at 65 in Austria (8.3 yrs) and Hungary (6 yrs). Slovakia has the lowest numbers with 3.5 and 2.9 healthy life years for men and woman age 65 respectively.

The ration of healthy life years at age 65 as a proportion of life expectancy at age 65 is highest for both men and women in the Czech Republic (53.8% and 45.3% respectively) and lowest in Slovakia (24.1% and 15.8%).

Figure 8 illustrates the increase in the population aged 65 and over from 1990 until 2050. Real data is used for the period from 1990 to 2010, projected rates are used for 2020-2050. It shows a growth of this population group in all countries of Central Europe. The development in the various countries is largely parallel but takes place at different levels. The shares of those aged 65 and over have risen from around 10% of the population in Poland, Slovenia and Slovakia and around

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15% in Austria, Germany and Italy in 1990 to over 15% in Slovenia and over 20% in Germany and Italy in 2010. Until 2050, the share of people aged 65 and over is projected to be around 30% in all Central European countries.

Figure 8 Percentage of population aged 65 and over on 1 January of selected years
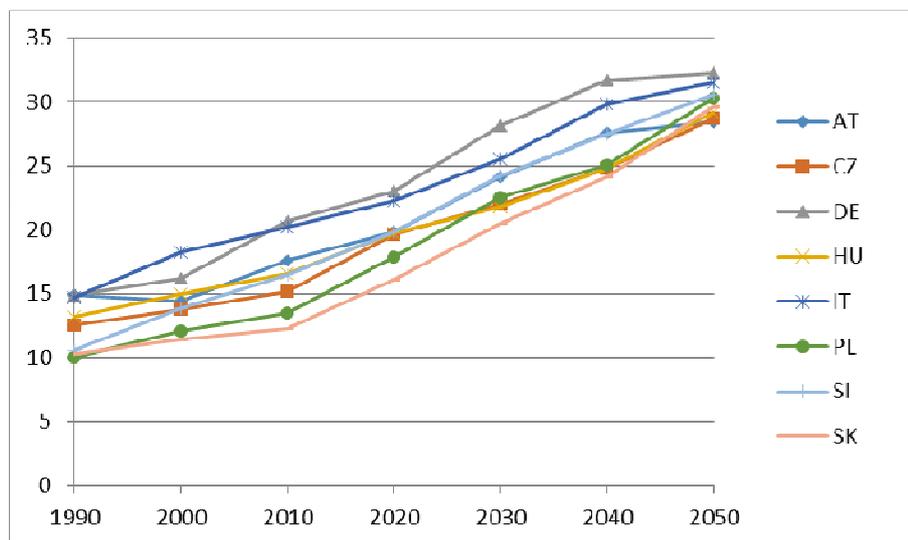
Source: own production based on Lanzieri (eurostat), 2011

The percentage of the population aged 80 and over increased in all countries of Central Europe from in 1990 to 2010 (see figure 9). In the Czech Republic, Hungary and Poland, the share almost doubled from around 2% to almost 4% in these 20 years. In Italy, the percentage of those aged 80 and over doubled from around 3% to almost 6% of the population. The projection for the development of this age group's share until 2050 shows important differences between the individual countries. While the share of people aged 80+ will amount to around 8-9% in Hungary and Slovakia in 2050, it is expected to rise up to over 12% in Italy and over 14% in Germany.
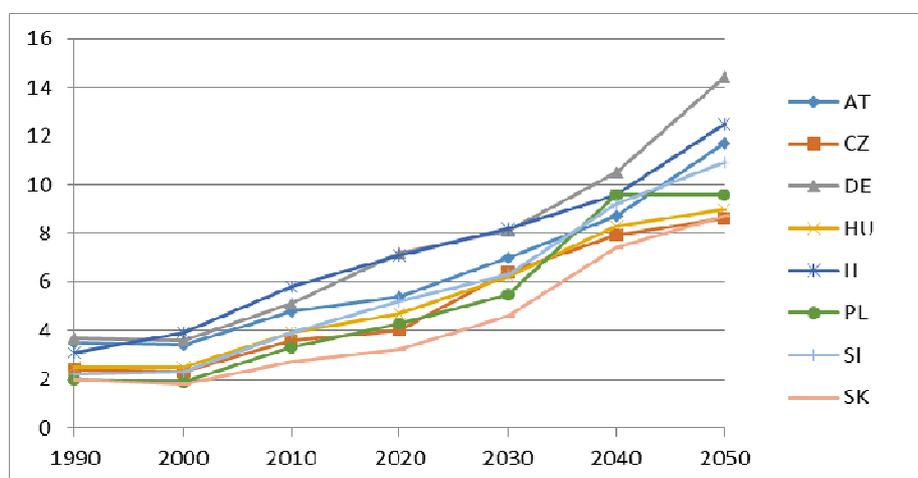
*Figure 9 Percentage of population aged 80 and over on 1 January of selected years*

Source: own production based on Lanzieri (eurostat), 2011

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In 1990, the old-age dependency ratio – people aged 65 or above relative to those aged 15-64 – was around 15% in Poland, Slovenia and Slovakia and around 20% in the other countries of Central Europe. In 2010, the ratio has increased the least in Poland and Slovakia (both below 20%), and the most in Germany and Italy (both over 30%). The old-age dependency ratio is projected to rise in all countries until 2050. The expected percentages range from around 50% to almost 60%. According to the projection, in Austria the ratio will be the lowest (below 50%).

The population structure indicators for 2010 and 2030 (projected) for the four regions of the SPES project – Austria, Czech Republic, Italy (partly), Slovakia – provide detailed information regarding the share of the total population aged 65 or over as well as the old-age dependency ratio (see table 3). These shares and ratios, as well as the total population (except in Slovakia), are projected to increase in all four countries until 2030.

Figure 10 Old age dependency ratio on 1 January of selected years (in %)
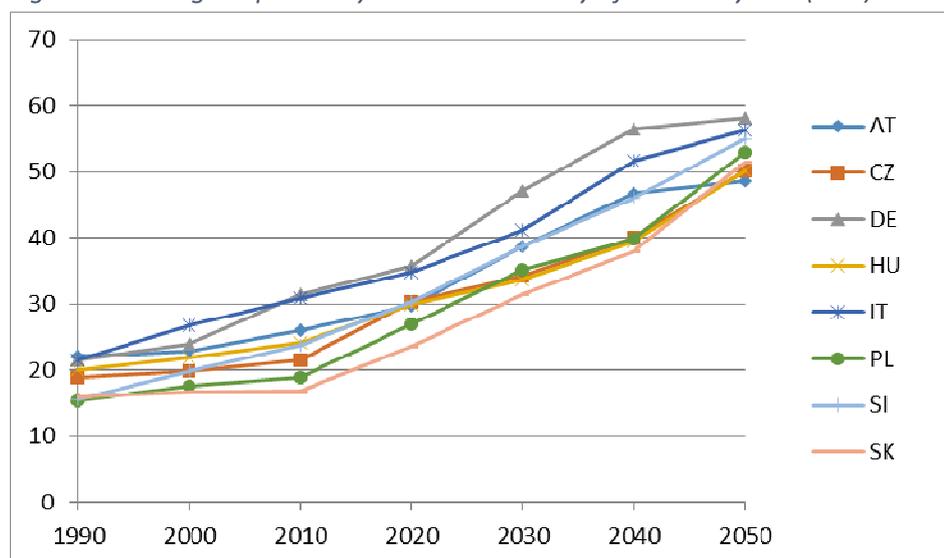
Source: own production based on Lanzieri (eurostat), 2011

In Austria, the total population was around 8.4 million in 2010, expected to rise to over 8.9 million until 2030. The share of the total population aged 65 or over was 17.6% in 2010 and is projected to increase to 23.7% until 2030. In 2010, the rate was highest in Burgenland (19.8%) and lowest in Vorarlberg (15.2%). For 2030, these shares are projected to rise in all provinces. Kärnten will then have the greatest share of people aged 65 with 28.3% of the population. Consequently, the ratio is calculated as the highest in Burgenland in 2010 (29.7%) and in Kärnten in 2030 (48.0%). In total, the old-age dependency ratio in Austria was 26.0% in 2010 and is supposed to grow to 38.1% until 2030.

In the Czech Republic, the total population is projected to be stable around 10.4 million (with a slight increase). Overall, the share of people aged 65 or over will rise from 15.4% of the

total population in 2010 to 22.9% in 2030. In 2010, this share was the highest in Prague, the capital region, (16.5% of the population) and the lowest in Strední Cechy (14.8%). For 2030, the highest shares are projected for Strední Morava (24.3%) and Moravskoslezsko (24.2%). While in 2010 the highest old-age dependency ratio was registered in Prague with 23.2%, it will be 38.3% in Strední Morava and 38.2% Moravskoslezsko in 2030. The Prague region is then expected to have the lowest ratio (30.4%).

In the relevant regions of Italy, the population is projected to increase slightly except for Friuli-Venezia Giulia and Liguria, which will decrease slightly from 2010 to 2030. In the whole country, the share of people aged 65 or over is expected to rise from 20.3% of the total population in 2010 to 26.2% in 2030. In the regions of Italy adhering to Central Europe, Liguria had the highest share (27.0%) and Provincia Autonoma di Bolzano/Bozen the lowest share (17.7%) in 2010. For 2030, this distribution is projected to continue. Concerning the old-age dependency ratio, Italy will see an increase from 31.0% to 42.2% in total. While the highest ratio was registered in Liguria (43.7%) in 2010, the lowest ratio was found in Provincia Autonoma di Bolzano/Bozen (27.1%). This distribution corresponds to the shares of people aged 65 or over and is projected to be continued in 2030.

In Slovakia, the overall population is projected to decrease slightly from 5.4 to 5.3 million. However, the share of the total population aged 65 or over (from 12.3% to 21.3%) as well as the old-age dependency ratio (from 16.9 to 32.3%) are expected to almost double from 2010 to 2030. In 2010, the share of people aged 65 or over ranged from 11.1% in Východné Slovensko to 13.2% in Západné Slovensko. The latter region is projected to have the highest share of people aged 65 or over (23.2%) as well as the highest old-age dependency ratio (35.3%) in 2030.

Table 3 Regional population (on 1 January) and population structure indicators for 2010 and 2030

	Total population (in thousand)		Share of the total population aged 65 or over (%)		Old-age dependency ratio (%)	
	2010	**2030**	**2010**	**2030**	**2010**	**2030**
EU 27	499 389	519 942	17.4	23.6	25.9	38.0
Austria	**8 405**	**8 988**	**17.6**	**23.7**	**26.0**	**38.1**
Burgenland	283	296	19.8	27.8	29.7	46.4
Kärnten	561	545	19.1	28.3	28.7	48.0
Niederösterreich	1 614	1 774	18.7	24.8	28.2	40.7
Oberösterreich	1 415	1 445	17.0	24.7	25.3	40.4
Salzburg	534	549	16.4	25.0	24.1	40.6
Steiermark	1 210	1 226	18.8	25.5	27.9	41.4
Tirol	711	761	16.1	23.5	23.6	37.7
Vorarlberg	370	394	15.2	23.0	22.4	36.9
Wien	1 708	1 997	16.7	18.9	24.2	28.7
Czech Republic	**10 394**	**10 420**	**15.4**	**22.9**	**21.8**	**35.7**
Jihovýchod	1 652	1 614	15.9	23.7	22.7	37.3
Jihozápad	1 196	1 201	15.6	23.8	22.1	37.3
Moravskoslezsko	1 240	1 145	15.0	24.2	21.1	38.2
Praha	1 220	1 265	16.5	20.5	23.2	30.4
Severovýchod	1 497	1 474	15.5	23.7	22.1	37.2
Severozápad	1 137	1 122	13.9	22.3	19.5	34.8
Střední Cechy	1 224	1 425	14.8	21.1	21.1	32.6
Střední Morava	1 228	1 173	15.7	24.3	22.3	38.3
Italy (total)	**60 017**	**61 868**	**20.3**	**26.2**	**31.0**	**42.4**
Emilia-Romagna	4 333	4 725	22.7	26.1	35.3	41.9
Friuli-Venezia Giulia	1 225	1 214	23.6	29.4	36.8	49.1
Liguria	1 611	1 592	27.0	30.9	43.7	52.5
Lombardia	9 767	10 515	20.2	25.0	30.7	40.0
Piemonte	4 420	4 428	23.0	28.1	35.8	46.3
Provincia Autonoma di Bolzano/Bozen	501	550	17.7	23.1	27.1	36.9
Provincia Autonoma di Trento	521	583	19.4	25.0	29.7	40.6
Valle d'Aosta/Vallée d'Aoste	127	132	20.9	27.0	31.9	43.9
Veneto	4 890	5 221	20.0	26.2	30.4	42.2
Slovakia	**5 407**	**5 332**	**12.3**	**21.3**	**16.9**	**32.3**
Bratislavský kraj	615	626	12.9	21.5	17.3	32.1
Stredné Slovensko	1 349	1 306	12.2	21.3	16.9	32.3
Východné Slovensko	1 581	1 598	11.1	19.0	15.6	28.9
Západné Slovensko	1 862	1 802	13.2	23.2	18.0	35.3

Source: own production based on Giannakouris (eurostat), 2010

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3.4 Summary

The demographic change described in this chapter will have significant social and economic consequences. Healthy and active ageing, including adaptation measures, can contribute to mitigating the effects of demographic change. Finding ways to promote healthy and active ageing can create new societal and economic models. Increasing numbers of healthy and active older people represent a vital resource for society – as citizens, family members, volunteers, workers and consumers – which needs to be valued and harnessed. It is essential to improve the quality of life and dignity of older people and at the same time to provide new forms of growth opportunity in order to mitigate the anticipated negative effects of demographic change. (cf. AGE Platform Europe 2011)

Due to these developments, finding innovative ways to encourage healthy and active ageing is central to the European political agenda. Active ageing and intergenerational solidarity also represent an important element of the EU's strategy for economic growth 2010-2020. Growth needs to be 'smart', sustainable and inclusive in order to develop services and products for older people, for people to be able to age healthily and actively, and for guaranteeing opportunities and quality of life for the increasing numbers of older people. (cf. ibid)

2012 was the European Year for Active Ageing and Solidarity between Generations. Its objective was to serve as a framework for raising awareness, identifying and disseminating good practice and encouraging policymakers and stakeholders at all levels to promote active ageing and solidarity between generations. It aimed at promoting active ageing in the fields of employment, participation in society, health and independent living, and intergenerational solidarity. In addition, the European Commission has started a European Innovation Partnership (EIP) on Active and Healthy Ageing. The EIP's aim is to foster partnership between all the relevant stakeholders regarding innovative solutions in prevention and health promotion, integrated care, and independent living of older people. In this process, local and regional actors represent key actors since they are able to understand and respond to the specific challenges of demographic ageing for their communities. This approach was also realised in the SPES project.

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4. Comparison of the 4 regions/countries (AT, CZ, IT, SK) in the field of AAL, e-Health and Telemedicine

In the scope of SPES WP 6, the partners in the four regions – Czech Republic (CVUT and ProDeep), Slovakia (Košice), Italy (Province of Ferrara) and Austria (Vienna) – were asked to answer a 'Roadmap Questionnaire' consisting of questions regarding e-Health, AAL and Telemedicine in their regions. In this chapter, the partners' answers are presented in a comparative manner.

4.1   Different status quos regarding the state of implementation of e-Health, AAL and Tele-medicine in the four regions

In the four regions, various developments are taking place in the field of e-Health, AAL and Tele-medicine. The countries have developed specific strategies, at national and local levels, to promote the implementation of assistive technologies. The different legal frameworks and policies as well as the varying composition of stakeholder networks contribute to differences in the status quo concerning the state of implementation.

In **Austria**, the Federal Chancellery co-ordinates horizontal information concerning social issues of ICT. The Federal Ministry for Transport, Innovation and Technology (BMVIT) is the main actor for ICT activities and the Federal Ministry for Health (BMG) is active as well, e.g. in health telematics.

In 2005 the „E-Health-Initiative", was established by the Federal Ministry of Health and the Consortium of data processing as an independent platform. Main objectives were to promote the development, co-ordination and harmonisation of electronic services in health care. The "E-Health Initiative" is an expert committee and has developed a position paper for an Austrian E‑Health-Strategy, which was presented last year to a professional audience. The proposal was peer-reviewed and open to public comment and was now – after revision – applied to political discussion and opinion making. In 2005, the Austrian e-card was introduced and was requirement for the electronic health record (ELGA), which was enacted in 2012. Telemedicine, however, is not very developed yet. A committee (Telegesundheitsdienste-Kommission) has been installed in 2013. One of their first activities now is to prioritise 3 application areas (e.g. cardiovascular diseases, diabetes) to implement them in the regular care.

Several research institutes deal with AAL-related problems, combining academic and non-university research. In the last ten years the Federal Ministry for Transport, Innovation and Technology (BM VIT) carried out or supported programmes such as FIT-IT, benefit or AAL. Since 2008 the thematic programme "benefit" provided 24 million Euro funding and 120 projects could be realized. On the initiative of the Federal Ministry for Transport, Innovation and Technology the platform Ambient Assisted Living (AAL)-Austria was established. The objectives are to build up an Austrian AAL-community, to bring together providers and users and to achieve an exchange of experiences between the very heterogeneous stakeholders.

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At the local level, the Vienna E-Health strategy is integrated in national and international activities to avoid local isolated applications, which are not compatible within the EU-Action Plan. The Vienna e-Health Strategy Board is responsible for supervision and advancement of the Vienna e-Health strategy as well as for accord of cross-sectoral e-Health plans and projects (Wiener E-Health Strategie 2007, updated 2012). Members of this Board are representatives of the local government (Chief Executive Office, Municipal Department 24 - Health Care and Social Welfare Planning, Vienna Hospital Association), the ELGA corporation, the Vienna Social Fund, the Medical Association, the Pharmacist Association, the General Accident Insurance, the Vienna Regional Insurance Company, the Medical University of Vienna, private hospital owners and others.

In the **Czech Republic**, the term e-Health was initially understood primarily as the provision of health care across the internet (around the year 2000). Later, it proved important to emphasize the difference between Telemedicine and e-Health services. While Telemedicine applications are expected to support mainly medical and health care professionals, e-Health is a broader term that may not necessarily be centred on health professionals. Today, telemedicine is seen as part of e-Health and it remains focused mainly on professional medical and therapeutic applications. This is well documented e.g. by the main topics specified for the IX. International Congress of Information Technology in Health Care "Telemedicine Brno 2013", which include diagnostic software and hardware for evaluating the images, Hospital Information Systems, sharing image documentation, and digitization for teaching processes.

The issue of e-Health is primarily pushed by several civic associations, namely by SAK (United accreditation committee for health institutions) and the Czech National Forum for e-Health. While SAK perceives e-Health as a tool for improvement of care quality, the Czech National Forum tries to increase awareness and promote the development of e-Health in the Czech Republic. This objective was introduced by its chair MD Cabrnoch at the seminar on "Tools and services for e-Health" in October 2007. The participants of this seminar expressed the need to design a conceptual plan for the development of e-Health and for adjustments in the Czech legislative environment. It has been agreed that it is in the common interest to take advantage of temporary financial assistance from the Structural Fund and other EU funds as well as intended plans for changes in health legislation to design and create an up-to-date concept e-Health meeting current priorities. The latter include interoperability of health information systems and electronic medical records (like an electronic identifier). This civic association has no political strength and consequently its ability to realize its goals is very limited.

The Czech e-Health concept was officially introduced by the Czech Ministry of Health in 2008. In practice, however, no comprehensive operational program or a dedicated priority axis covering this area has been adopted yet. Awareness of e-Health and its potential for the Czech Republic is rather low. Information available on the website of the Ministry of Health is relatively outdated and limited. Various professional communities try to make up for this unfavourable situation by introducing dedicated working groups ready to assist in the design of viable concept. For example, in 2013 a working group on e-health was established by the Czech Medical

Association of Jan Ev. Purkyně. Public administration is frequently focusing attention only to systems of electronic health records when presenting electronic health services (e.g. during annual international conferences ISSS: Internet in Public Administration). Systems of electronic health records (books) should enable every Czech citizen to monitor his/her personal health acts (operations) as well as related financial costs. Those systems are under control and surveillance of insurance companies. Unfortunately, most citizens do not use them at all. On the one hand, they have no motivation; on the other hand, they often do not know how to access relevant data.

Real e-Health solutions, however, appear rather rarely on separate medical wards (e.g. cardiology, etc.) in some hospitals. Distress care (including monitoring of health status of patient) outside the above-mentioned hospital systems is far from frequent. For example, the only subject providing it in the South Moravia region is ProDeep (Protected ICT workplace Deep). This distress care has been designed according to the needs of its customers and with cooperation of the SPES project. As a result, there are two towns, namely Brno and Boskovice, which have already incorporated the distress care (based on Czech law of social services) into their long-term community plans.

In **Italy**, since 2002 the Emilia Romagna region has created an integrated network of Local Health Agencies, Hospitals, General Practitioners (GP) and Paediatricians. Through the Electronic health record (FSE) the clinical history of every citizen of the region is provided. SOLE involves all GPs and Paediatricians of the region (more than 3.000) and all citizens can access the network. E-Health in Emilia Romagna region is, first of all, a way of thinking, a general engagement for health improvement through ICT technology. Quality of healthcare is closely linked to the quality and quantity of the health information available to individuals and to those who deliver clinical care and services. Less bureaucracy, complete and immediate information, and faster communication: this approach integrates ICT technologies and systems that are continuously developing and growing.

The Electronic health record is fully available to the whole population in the Emilia Romagna Region since 2012. On the side of AAL for impaired people, several organizations are working to support people in identifying necessities and possibilities of the technologies and in creating "test flats" where impaired people can live for some time with their family to experiment the solutions. Telemedicine is still in an embryonic phase since medical remote devices are not yet well tested in large-scale use and their adoption is not positively evaluated by decision makers in the region. In this context, SPES represents the more advanced experience.

In **Slovakia**, concerning health care, the e-Health implementation programme started in 2008, after the "Strategic e-Health goals" were approved by the Slovak government. This material lays out a plan for the gradual transformation of national health services towards electronic processes and communication. This plan comprises several implementation phases. Each phase contains one main and several supplemental projects: The 1st phase, a national project called "electronic health services", includes the formation of a national health electronic portal filled with basic

information, the implementation of electronic medical records together with the related infrastructure, and pilot testing with selected health care providers. National law no. 153/2013 C.l. was enacted in May 2013, establishing a national health information system and amending a multitude of laws in order to prepare the implementation of e-Health. This phase should be concluded in the second half of 2013. The 2nd phase, a national project called "national health information system", currently is in the "design phase", aims at connecting all health care providers into a national e-Health system. This phase will end in September 2015.

With regard to social care, according to national law no. 448/2008 C.l., social services in Košice region include a service for monitoring and signalling request for immediate assistance. This service is provided for persons exhibiting health impairments and is provided continuously with the help of signalling or audio-visual device connected to a dispatching office, which initiates and mediates the assistance or emergency care. There are three such services registered in the Košice region, two of which are located directly in Košice City (one is provided by municipality and the other by a private company called Seniordom – Senior house) and one in Trebišov City (provided by the municipality). Košice city provides this service through a city-owned non-profit organization called "Centre for social aid". Currently, service is provided for 10 senior citizens. In the first half of 2013, the service was provided for 17 persons at average, and in the year 2013 it was provided for 15 on average. The "electronic guardian" is used by old people with hypertension, ischemic heart disease, diabetes, patients who overcame stroke and one blind client. Service is provided for people with medical conditions attested by a respective doctor. The senior house in the Košice provides service for 8 senior citizens, using a dispatching office located in the city of Banská Bystrica. The city of Trebišov provides service for 10 clients.

4.2   Short-term, medium-term and long-term objectives and activities on the part of the decision-makers/local authorities and on the part of the stakeholders.

Steps which have already been taken to approach these objectives in the four regions

In the four regions, a wide range of short-, medium- and long-term objectives of the stakeholders in the field of e-Health, AAL, Telemedicine is encountered. The key aims mentioned by the project partners include raising public awareness, realising projects and establishing test cases, implementing standards and interoperability, ensuring technical and financial means as well as commitment by policy makers.

The objectives of decision-makers in the four regions in the field of E-health, AAL and Telemedicine are differently developed in the four regions. While a Roadmap, a Plan and expert working groups have been established in Austria, Italy and Slovakia respectively, decision-makers' objectives in the Czech Republic have not been specified yet.

Several different steps have already been taken in the four regions to approach the objectives, such as participation in projects, creation of relevant documents and realisation of congresses and initiatives in the field of e-Health, AAL and Telemedicine.

In **Austria**, there are several open questions concerning telemedical services, which have to be discussed, such as funding, quality standards, protection of data privacy and ethical requirements. These items will be discussed in the commission (Telegesundheitsdienste-Kommission) and recommendations will be issued. A series of working groups of the E-Health-Initiative, where stakeholders from various sectors are involved, has focused on important questions like interoperability, standardization, technical frameworks, training and further education for technicians and for health-care professionals, use-cases were described, cost-benefit-assessments (from the perspective of the users, their relatives, of health-care professionals, of funders,….) were carried out. Some of the working groups have already finished, some have started in 2012. The developed position papers provide implementation recommendations.

The e-Medication pilot project started in April 2011 for operating tests in three regions in Austria (some districts of Vienna, Tyrol and Upper Austria). Thanks to this service, pharmacists, physicians and hospitals are able to see a patient's current medication in a list. Each time drugs are prescribed by a physician or over-the-counter drugs are bought in a pharmacy patients can have these and all current drugs tested for interactions and multiple sourcing. More than 100 physicians, about 50 pharmacies and 6 hospitals participate in this project. For patients, physicians, pharmacists and hospitals participation is voluntary and free of charge. After the end of the project in December 2011, the experiences and the data were evaluated statistically. The results of this evaluation are the basis for a nationwide implementation of the service e-Medication. In addition, the "E-Health Portfolio" is part of the Vienna E-Health Strategy and was published in 2011. It currently contains 30 projects in 8 categories such as "health and administration", "internal communication systems of institutions", tele-medicine or tele-monitoring.

The „Gesundheitsnetz Wien" started in 2007 as a phasing in-model, carried out by the Vienna Regional Insurance Company, the Vienna Hospital Association and the Vienna Medical Association, aiming at a better and secure communication and transmission of patient-related data between general practitioners and hospitals. Upon completion, all relevant healthcare- and patient facilities (hospitals, nursing homes, ambulance, practitioners, socio-medical centres, pharmacies, social insurances) shall be connected in one electronic communications network.

In 2013 with funding of the BMVIT (Federal Ministry for Transport, Innovation and Technology), "Smart Homes" for older people were established in Burgenland, a province close to Vienna. Researchers of the Austrian Institute of Technology and their partners equipped 50 flats of a provider of social services (Arbeitersamariterbund Österreich) with new technologies (e.g. emergency call, motion devices, order for meal, reminder of taking medication, monitoring of blood parameters, call for the domestic home care, warning of hot stove, video-chat with the family). This large-scale experiment allows to test the new technologies, to detect the user´s acceptance of the different modules and to evaluate their benefit for the residents.

The activities of the AAL-Austria platform focus on providing guidelines and recommendations, organisation and performance of presentations, workshops and discussion

forums, (public) awareness raising and public relation as well as networking between the members.

The Austrian e-Health Strategy includes a Roadmap with an approximate timetable. It includes issues such as nationwide infrastructure operations, ensuring the framework conditions for financing, analyses of on-going projects and their evaluation incorporated into the overall design of e-Health, Public Relations and actions promoting acceptability, network infrastructure, legislative measures, a concept of roles and rights, process definition across organisations, establishment of a health portal (according to the Health Telematics Act), the Electronic Health Record, standardisation and interoperability, development and publication of technical standards, and the setting-up of pilot projects and continuous evaluation. In addition, participation in EU-funded projects, are regarded as extremely important, particularly in terms of exchanging and gaining experiences as well as utilising international expertise.

Three key steps have already been taken: (1) the e-Health Governance Initiative (eHGI) aims at improving the quality of health care at the European level sustainably by supporting with electronic services. The focus is on further development of the legal and technical framework for e-Health-Services. Austria (the Federal Ministry of Health) is the Co-ordinator of this initiative. (2) The European Patients - Smart open Services project (epSOS) has the objective to facilitate the exchange of essential patient records and electronic prescriptions in-between European health care systems. Austria is partner of a consortium of altogether 23 European Member States and other partners. The two Austrian members in epSOS are the Federal Ministry of Health (responsible for the work package "Dissemination") and the ELGA-Association (responsible for the work package "Requirements Management" and parts of the work package „Technical Management"). (3) There is a liaison of STORK and epSOS (STepS); Austria co-operated in the project STepS, which developed synergies on eGovernment and eHealth.

In the **Czech Republic**, the following short-term objectives are envisaged: (a) to increase public awareness about e-Health applications and their potential for homecare; (b) to design and implement an information campaign and education services for patients as well as for caretakers; (c) to establish a consultation service as well as a rental service (free of charge) for assistive devices; (d) to establish "training apartments" where interested patient can get acquainted and used to all available support systems and assistive devices; (e) to implement working solutions for selected and defined areas based on standards with the future aim to interconnect diverse services; (f) to ensure (technical and financial) means for providing e-Health services to all current ProDeep customers who have started using e-Health services thanks to SPES project support. The crucial aspect for the realization of this goal is the settlement of finances from the SPES project. ProDeep has already invested into a SPES project funds, which will allow to maintain the current level of service for the next two years at least. (ProDeep has not been fully refunded yet.) Further continuation depends on the financial capabilities of disabled people, cooperating companies and other subjects to co-finance operation of current e-health and distress care.

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In the medium-term, the objectives are to design and develop novel tools and e-Health methods for home monitoring and rehabilitation and to test them in real-life and connect them to already existing verified solutions. An additional objective is to further promote e-Health services. It is deemed important to contact other towns and ask them to implement such concepts into their community plans, since the e-health services are co-financed from their budget.

Regarding long-term objectives, the Czech partners suggest e-Health services and ICT support of both health and social care at home for everyone who can benefit from them, including provision of necessary technical tools and funding of operation. Supporting independent living of older people and of people with special needs is considered a vital objective. In addition, it is regarded vital to ensure legislative support for the implementation of ICT (and related services) in the area of health, social services, but also in the area of security. Procedural support – provided by an internal directive act of the responsible ministry – which will encourage the usage of e-health and distress care services and promote it among medical doctors and social workers, is considered most effective.

The short-term, medium-term and long-term objectives of the decision-makers in the field of E-health, AAL and telemedicine have not been specified yet. The Czech partners aim at changing the local situation on the one hand by applications for grants that could partially cover e-Health and distress care services; on the other hand, the advantages of e-Health solutions are promoted by presenting past experience and results in e-Health and distress care on local conferences, web, information campaigns, etc. In addition, there is a number of NGO's and politicians (some are cooperating in the SPES project) who support the implementation of e-Health services into the long-term vision of the government of the Czech Republic.

In the Czech Republic, an address list of all public bodies, organizations, relevant project holders active in e-Health as well as organizers of relevant events (conferences and exhibitions) in Czech Republic is currently created. This address list also includes important politicians who have been informed about SPES project and who have already signed the SPES Letter of intent. Networking with a number of the upper mentioned stakeholders has started already. One of the relevant EU projects is "Assistive Technologies and Inclusive Solutions for All" (atis 4all). This project inspired the recent establishment of the Czech ATIS forum with the aim to join most of the stakeholders who develop and test isolated specific solutions for health and social care. The national plan for social care is currently under development. The objective is to influence its content in cooperation with politicians involved in SPES project who helped to push through certain goals inspired by SPES into the governmental proposal of a "Policy for development of technologies and services of assistive living for seniors". The outcomes from SPES project and from e-Health and distress care are presented at conferences of the state administration (ISSS) and at conferences concerning disabled people (INSPO).

In **Italy**, standards and interoperability are understood as issues of upmost importance in all the fields. Standards, integration profiles, certification programs are regarded as an important "building block" for enabling interoperability among different e-Health solutions, AAL systems and

support for a better Telemedicine adoption. Therefore, main objectives in these fields are: (a) to adopt the European standardization for AAL and telemedicine solution; (b) to adopt the European certification programme for AAL and telemedicine products and services; (c) to realize pilots of larger scale with the aim of integrating innovative telemedicine solutions with already existing networks at least at local and regional level; (d) to define the profile for a "European" health record able to define how to exchange data among care system within the European area. The latter represents a long-term and large-scale objective.

In Italy, the regional e-Health network is continuously evolving. Every three years, the regional government adopts the Emilia-Romagna's Telematic Plan (PiTER), the main planning tool of the Emilia-Romagna region and of local administrations within the regional territory. The objective of this Plan is to foster the territorial development of information technology within the society. The programme represents a contribution to the fulfilling of objectives established by the EU Digital Agenda. According to the Italian partners, future challenges include the following: (i) to improve the processes of communication with citizens through electronic health record and online services; (ii) to improve the processes of communication between the GPs/family paediatricians and the territory and hospital medical specialists; (iii) to ease the definition and management of diagnostic treatments (clinical pathway); (iv) to ensure a greater sharing of guidelines; (v) to rationalize and harmonize public health company's information systems. It is considered important to promote opportunities for sharing information with the members of the CTSS (Social and Health Territorial Conference) about the projects regarding Telemedicine and Telecare. The aim is to contribute to the development of priorities to be included within the social and health planning in coordination with other sectors such as education, labour, environment, mobility.

The Italian partners participated in the epSOS subproject, where more than 30 countries were involved. Regular participation to the National Committees on HL7 as well as steady collaboration with the regional health government are regarded as a necessary step to achieve the mentioned objectives. At the national level, guidelines for telemedicine were issued by the Italian Ministry for Health as a confidential document in 2012. This document is currently shared with regional governments for the definition of common instruments both at the technical and the organisational levels.

In **Slovakia**, concerning health care, the main objective of the e-Health implementation programme is to discover and fix any issues that arise in the pilot testing, manage risks, handle problems and gradually interconnect all health care providers. Starting from January 2013 the health care providers have the obligation to use e-Health application and services (e.g. ambulances, hospitals, pharmacies, laboratories). Between 2016 and 2020 the e-Health system will be enhanced, finalized and connected to the e-Health systems with EU. The objective is to ensure multinational interoperability of the abridged health record and electronic prescriptions for citizens between EU member countries.

In the field of social care, all involved actors plan to continue their participation. The difference will be in the implemented system for the assistance service. In Košice city, the service

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is implemented with "electronic bracelets", which provide a limited range (50-100 meters) from the device station located in the client's home. Outside this range, the service is not available. In Trebišov city, the connection is handled by a cellular network managed by Orange and by GPS service provided by a third party. The service is available at any place. From the long-term perspective, Košice city aims to provide the service in a similar manner, fulfilling the client's needs. In Slovakia, the first phase of the e-Health programme is currently being carried out. Expert working groups have been established for commenting the relevant policies and rules. Košice city is involved in these groups as well as a representative from Žilina region, with whom there is regular contact. The hospital in Dolný Kubín city, which is among the pilot health care providers for the e-Health application, is managed by the Žilina region. The launch of the pilot testing was expected to take place at the end of 2013. In the field of social care, the Slovak partners point out that continuation and improvement of the service depends on the financial capabilities of the providers and clients. Currently, Košice city has a capacity for 30 clients.

In Slovakia, the national congress of general practitioners was held in May 2013. At this congress, the newly developed electronic services and e-Health applications were presented for the first time by the spokespersons of the National Health Information Centre.

4.3 Steps considered meaningful by the partners at short notice and in the long run

The future steps considered meaningful by the partners are related to past developments and the status quo in the respective region. Raising the awareness, further training of professionals, ensuring interoperability and standardisation as well as finding nationwide solutions are only some of the necessary steps.

In **Austria**, the Electronic Health Record is considered an important component of the e-Health Strategy. The law concerning the Electronic Health Record (ELGA) entered into force in 2013. ELGA will be filled with data starting in 2015, full operation is planned by 2017. This topic is currently discussed controversially in the public. Another step considered meaningful is the integration of the Federal Ministry of Labour, Social Affairs and Consumer Protection in common activities. In addition, common study programmes, trainings and further education for technical, medical, therapeutical and nursing professions are regarded necessary. Further development of the Austrian E-Health strategy, the development of compatible and modular products as well as the inclusion of special AAL-devices into the catalogue for medical aids and appliances represent further important steps.

In the **Czech Republic**, the following steps are considered meaningful at short notice: raising the awareness of the public as well as of health professionals about existing successful e-health applications and about their advantages leading to quality of life improvement, better health care and/or economic impacts. The stakeholders should agree on basic standards to be used and on a strategy that will ensure a sustainable financial model for funding e-health and social services in

such a way that these services are available to everyone who can benefit from them. Close cooperation with research institutions and universities in the Czech Republic should be supported in order to ensure that the offered tele-solutions apply state-of the art tools and approaches. It is important to search for additional novel promoters of e-health applications, (e.g. trade unions). In the long run, the implementation of the strategy described for "short term future" is envisaged. In addition, close cooperation with interested charities and civic organizations as well as support of further technical advances for the domain and the search for efficient affordable tools and solutions are considered meaningful steps.

In **Italy**, a common national framework on interoperability and standardisation should be established as soon as possible. In the long run, a successive agreement at European level is envisaged. Another possibility– the other way round – is the definition of a "European" profile for telemedicine based on available standards like HL7 and then the adoption of this profile at the national level. The process is still running for the European Invoice based on the UBL standard and on the e-Prescription project.

In **Slovakia**, getting access to the currently tested electronic applications and interconnection of available applications are the next steps. Further steps are testing and resolving issues, a nationwide solution and launching the nationwide e-Health system, which is still being worked on.

4.4 Implementation of assistive technologies in the four regions

The timelines considered realistic for the implementation of E-health, AAL and telemedicine differ in the four regions. While smaller elements are expected to be implemented within a few years, bigger changes are regarded realistic for around 2020.

In **Austria**, some applications and devices are expected to be implemented within 2 years, major projects will possibly be realised by 2020.

In the **Czech Republic**, 2-5 years are estimated for the separate modules and 8-10 years for the realization of the complete interconnected systems.

In **Italy**, the main e-Health infrastructure is already widespread in the region. The availability both of a clear legislative framework and of reliable and certified services and products are necessary steps to be fulfilled. Agenda 2020 and new research programs like HORIZON 2020 will help to reach this objective. A certain degree of implementation seems realistic until 2020.

In **Slovakia**, the expected date of finalization is December 2015. The gradual connection of health care providers is scheduled for January 2013 until September 2015. This schedule will be met if the legal act 153/2013 will not be amended.

4.5 Responsibility for taking steps in the implementation as well as current and future responsibilities for funding

This section explores the partners' perspectives regarding responsibility for taking steps in the implementation as well as current and future responsibilities for funding technical provisions in the four regions.

The partners emphasise that cooperation of all stakeholders is vital in the process of implementation. In general, the competent ministries are regarded as bearing the main responsibility in this process.

In the partner regions, the costs are currently mainly covered by the users, partly also by regional authorities. The future responsibility for funding technical provisions is generally seen with the competent Ministries.

In **Austria**, the Federal Ministry of Health and the Federal Ministry for Transport, Innovation and Technology bear the main responsibility. In addition, the Federal Ministry of Labour, Social Affairs and Consumer Protection has to be involved from now on. The Main Association of Austrian Social Security Institutions (Hauptverband österreichischer Sozialversicherungsträger) is also considered responsible for taking steps in the implementation.

Concerning funding, responsibility is currently mainly carried by the users themselves and their relatives. In some cases, they receive subsidies. In the future, the health insurance companies and the Ministries for Health and for Social Affairs should be responsible for funding technical provisions. In addition, private co-financing for persons with incomes above a certain level would be imaginable.

In the **Czech Republic**, it is suggested that true working e-Health solutions have to be implemented in close cooperation with a number of stakeholders, namely the Ministry of Health and Health Insurance companies, the Ministry of Social Affairs, relevant professional societies, agencies offering home care and charities. Also the Ministry of Interior has to be included, which is responsible for the integrated rescue system and for security maintenance. The Ministry of Interior can therefore support the coordination of activities between state administration and rescue services if required. All of these stakeholders have to agree on a model that will ensure reliable independent supervision of services and their quality provided by companies performing the implementation.

In the Czech Republic, most of the current e-Health activities are funded by different types of grants or by the users of the services themselves (this is the case e.g. of a private ophthalmology rehabilitation clinic). In the future, the expenses should be covered from multiple sources

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including Health Insurance companies, Ministry of Health, Ministry of Social Affairs. In addition, a model with co-financing by the patient family should be considered.

In **Italy**, the responsibility lies with the regional health and industrial ministries according to EU directives and national guidelines.

Funding responsibility is given to the Telematic Plan of Emilia-Romagna issued by the Ministry for the Digital Agenda in agreement with the regional Health Ministry.

In **Slovakia**, in the field of health care the Ministry of Health and its subsidized organization called "National health information centre" are responsible for the operation of the website about e-Health, for the standardization of the information system on health service, for collecting, processing and providing health-related statistical data and for providing library and information services in the field of medical sciences and health services. The centre is also the operator of national health registries and national administrative registries. The e-Health project is realized by the consortium of the companies NESS Slovakia, a.s. and Lynx, spol. s r.o.. The expected finalization date is the second half of 2013, after which the pilot testing takes place. This includes the realization of the National health portal, which will provide health information for both, patients and doctors, comprising a detailed medical and prescription history. Regarding social care, the statutory person of the non-profit organization under Košice city is responsible for the development and maintenance of the services. All decisions are subject to the approval of the city council, including budget issues and reimbursements. The private subject Seniordom is under its own autonomous management, as well as the city of Trebišov, within its city council and administrative body.

Regarding health care, the pillar projects of the first and second phase will be financed from the structural EU funds in the Operational Programme "Information Society". Concerning social care, the actual amount, the method of determining and paying for social services provided through the non-profit organization of Košice city is determined by the city regulation no.130. The amount paid by the client is 12 Euros per month. As the non-stop monitoring service needs continuous attendance of the personnel, it is handled by the operators in the social aid centre. In 2012, Košice allocated 47.781 Euros of its budget for this service (operations, wages, etc.). The incomes from services in that year amounted to 2.050 Euros.

4.6 Risks to be taken into consideration concerning the implementation of E-health, AAL and telemedicine and risks to be avoided

In the four regions, a set of different risks are mentioned, which have to be taken into consideration with regard to the implementation of assistive technologies. According to the partners, personalisation of products, affordability as well as contact and communication with clients and stakeholders are among the key factors to be considered.

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The **Austrian** partners point out that it is essential to have reliable systems, to ensure interoperability and to take into account the usability of products. In addition, acceptability plays a role (attractiveness of products and design, not stigmatising). Affordability of products needs to be guaranteed (e.g. through reimbursement). In general, the accessibility of buildings has to be improved. It is also highlighted that technical solutions can support people but cannot replace human contact. They also emphasise that data protection and data security must be guaranteed. Another risk is seen, like by the Czech partners, in the possibility that many isolated, stand-alone solutions will be operated due to a lack of standardisation and of interoperability. It is pointed out, that user involvement from the beginning of planning and developing is essential in order to meet the target groups' needs.

The **Czech** partners underline that human, technical and economic aspects have to be taken into account. Regarding the human aspects, the following has to be considered: technical solutions cannot replace human contact between the patient and health professionals and social care workers. In addition, human health professionals have to remain in the loop of all important decisions concerning significant changes in medication or care. Compliance between protection of patients personality (and his/her fundamental rights) and e-Health services methodology has to be ensured. In addition, personalized solutions are necessary: on the one hand, provided solutions have to be accessible for different types of users (including challenged persons), on the other hand used solutions have to be fine-tuned to the needs of each specific user. Technical support for personalization of the applied tools has to be easily available if required for proper functioning.

Concerning the technical aspects, it is deemed vital not to neglect the means and funds for technical maintenance of the used equipment. In addition, internet access is necessary for all users; the corresponding costs thus have to be included in the model. Possibilities of human failures also have to be taken into account – this can be improved by introducing reliable automated (unattended) systems for patients as often as possible.

With regard to the economic aspects, several points have to be considered. Development of applied solutions has to be cost-effective: while too many separate and incompatible solutions mean too expensive development and maintenance, the decision to support single closed solutions prevents quick integration of novel research results as well as meeting specific needs of small groups of users. One should also be aware of particular interests of involved commercial companies. Furthermore, co-financing of the services by health and social care insurance companies has to be resolved.

The following aspects are considered as the biggest dangers: the absence of a long-term vision, concept and strategy; lack of trust and support from the healthcare professionals, social workers and caretakers; lack of standardization; and neglect of the need for interoperability, compositionality and flexibility of the supported solutions. Furthermore, the state and public

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authorities have to offer and accept clear financial model specifying who pays for what, how and when and to what extent.

In **Italy**, there is an awareness of several risks, such as poor and inconsistent implementation of privacy and security safeguards for personal data, lack of communication flows between formal and informal carers, condition of home environment, or lack of technology assessment for the proposed solutions. Additional risks may be poor personalization of technology interface according to the user target group (age, autonomy degree, etc.) and difficulties in identifying advantages in project realization and return on investment for care providers, social services and insurances. A low level of awareness of decision makers and low interest of the market in these fields are considered further risks.

It is also regarded essential to ensure patient safety and to prevent the corruption of personal data.

In **Slovakia**, there are two key issues that have to be taken into consideration: material and technical equipment on the one hand and the abilities of all participants – ambulances, hospitals, pharmacies, etc. – on the other hand.

According to the partners in Slovakia, the concrete risks will be known after the launch of the pilot testing, where nearly 12.000 health care providers will be connected.

5.   Awareness Raising

Tele-assistance solutions make significant contributions to meeting the challenges of an ageing society. To promote the development of AAL systems, e-Health and Telemedicine awareness raising among citizens, stakeholders and politicians is necessary.

5.1   How could awareness be raised about Assistive Technologies?

Knowledge about assistive technologies varies significantly among decision-makers, experts and the general public. Therefore an exchange of experience and opinion as well as awareness raising locally, regionally and among European regions has to be promoted.

This could be done by

- o   bringing together relevant stakeholders in the field of assistive technologies
- o   setting up platforms to get a shared understanding of all stakeholders about assistive technologies and to make them more aware of other people's issues
- o   providing appropriate expertise and consulting of decision-makers
- o   communicating the benefits of these devices in an intelligible form
- o   making benefits visible

- establishing links to municipal, regional, national and European activities and promoting networking between tele-assistance projects and municipal, regional, national and European representatives
- identifying, disseminating and exchanging of good practice
- information campaigns about success stories

As part of the SPES project a Strategic Political Committee (SPC) was established at the first SPC Meeting in Vienna in April 2012 with high-ranking representatives from the involved regions. This committee has the assignment of contributing towards an area of tele-assistance in Central Europe through cross-border collaboration on the political level, initiating a dialogue on the supra-regional level and promoting innovative developments between the partner regions.

The representatives also signed a Letter of Intent which set the work of the forum on solid foundations in order to reach the cross-border aims of the committee.

Additionally a "promotional" video about SPES was prepared and was made available publicly.

5.2   Which strategic alliances and co-operations are necessary for a sustainable development of Assistive Technologies?

A great challenge for reaching a sustainable development of Assistive Technologies consists in bringing together the very heterogeneous group of stakeholders.

Health professionals, technicians, sociologists, economists, care providers, social services, researchers working in the field of assistive technologies, patients´ associations, lawyers, etc.… and representatives of the "competent ministries" and "authorities" such as planners of health services or social insurances have to be brought together at regional, national and at European level.

These alliances and co-operations are becoming more and more important to make this topic visible in public, to promote an efficient exchange of experiences, to exploit synergies and to develop common strategies. These co-operations also support the bringing together of service providers and technology developers with the end-users.

6.   Conclusion and Recommendations

Demographic change is not a special national trait but a trend that is apparent in all industrial countries. The projections for 2020 to 2060 show that in the EU-27 in 2060, persons aged 65 and over will rise from 17% to 30%, those aged 80 and over (rising from 5% to 12%) will be almost as numerous as the young population. While the population aged 65 and above will almost double, the number of people aged 80 years and above will almost triple from 2010 to 2060.

Assistive Technologies have the potential to make the users´ lives easier and more independent. They have on the one hand an important and potentially very rewarding task, because they offer

independence or support to their users, they can help reducing costs in the health care system and providers can benefit economically.

On the other hand these technical solutions can be a daunting problem because technologies aren´t easy to develop and the highly heterogeneous user group also means a large number of user requirements.

For establishing assistive technologies in everyday practice the following is required: robust technology (assistance systems that do not only work under laboratory conditions), sustainable business models (affordable technology, hybrid products), user friendliness (intuitive operability), training for planers, installers and technicians with "AAL know-how", integration with the health care system, interoperability (guaranteeing that all components fit together since). (cf. Eichelberg 2012)

In the four regions of the SPES-project (Austria, Czech Republic, Italy and Slovakia) specific strategies at national and local levels to promote the implementation of assistive technologies (AAL, e-Health and Telemedicine) have been developed.

The different legal frameworks and policies as well as the varying composition of stakeholder networks contribute to differences in the status quo concerning the state of implementation.

The key aims of the stakeholders in all four countries are raising public awareness, realising projects and establishing test cases, implementing standards and interoperability, ensuring technical and financial means as well as commitment by policy makers.

Also a set of different risks concerning the implementation of assistive technologies are mentioned such as affordability, loss of contact and communication with clients and stakeholders, personalisation of products and data protection.

Recommendations

Legal requirements

> Data protection and data security must be guaranteed (due to EU-directives, national laws and regulations, national, European and international standards, quality assurance)

> Keeping the personal data processed to the absolute minimum due to the principle of data avoidance and minimisation

> The markets for assistive technologies have a European resp. an international dimension, therefore European resp. international standards have to be established

> Financing models (devices have to be affordable for all people - fundings, co-financing models)

Awareness Raising among the general public, policy makers and stakeholders

> Communicating the benefits of these devices in an intelligible form

> Making benefits visible

> Realisation of pilots of larger scale

> Information campaigns about success stories

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Standardization
- ➢ For meeting various requirements a high level of system compatibility, interoperability and inter-changeability of constituents are needed
- ➢ Development of (compatible) modular systems which allows the expansion of already existing applications. So, familiar and proven solutions could be used cost-effectively further on.

Usability and accessability
- ➢ Simple and clear usability is required
- ➢ Accessibility of buildings has to be improved
- ➢ Necessity of involving property developer, planning agencies and architects for barrier free building or reconstruction of flats and houses

Programmes for training and further education
- ➢ Common study programmes (e.g. "Health Assisting Engineering" in Vienna), trainings, further education and additional qualifications for technical, medical, therapeutical and nursing professions are regarded necessary
- ➢ Further training for small enterprises and craftsmen working in the field of AAL

User requirements
- ➢ When developing new solutions for specific target groups, the integration of users into the innovation process is essential to ensuring that new products meet their needs. One has to gather information about the target groups, their requirements, characteristics, daily routines, etc. and one has to avoid incorrect generalisations; identify real user needs and understand their real problems
- ➢ When developing technical devices, gender and economic related issues must be taken into consideration. A larger portion of the senior citizen segment is female with a lower pension income than men, reflecting their lower working life income. Many women's attitude towards technical devices (still) differs from men's technology approach.
- ➢ Attractiveness of products and of design have to be considered, devices must not be stigmatising
- ➢ Systems have to be reliable and stable
- ➢ Special AAL-devices have to be included into the catalogue for medical aids and appliances

It always must be taken into account that high quality care is characterised by interpersonal communication. Therefore assistive technologies must never be seen as a substitute for personal care but rather as complimenting traditional forms of care and enabling more choices for individuals (Porteus, 2006).

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