



**European SeniorWatch Observatory and Inventory -**  
*A market study about the specific IST needs of older and disabled people  
to guide industry, RTD and policy*

[www.seniorwatch.de](http://www.seniorwatch.de)

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# **Older People and Information Society Technology**

*A Global Analysis*

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### Short Description:

Whereas the previous deliverable of work package five (D5.1) presented a comprehensive, comparative analysis of the situation of older people in the European Union and its respective Member States, of their expectations and needs regarding IST products and services, this Deliverable will focus on a global comparison, i.e. it will juxtapose and analyse the European Union situation with that in the United States of America and in Japan. These two countries have been chosen because they are the two of the largest economies in the world; furthermore, the USA is leading in many areas of development and application of ISTs, and the same applies - with respect to general IST applications - to Japan as a prime competitor to the EU in the global market. Also, Japan is faced with challenges similar to Europe regarding the ageing of its society (whereas in the USA the forecasts are less dramatic).

For this global comparison, it was not possible to draw on primary market survey data comparable to those collected for all Member States and instead SeniorWatch relied on secondary sources of data and information: We were able to commission national reports for these two countries similar to the ones collected for all Member States, but otherwise data published by the OECD, those available from national sources or published on the WWW was relied upon. For the USA, relevant data was available from various associations/interest groups, particularly the American Association of Retired Persons (AARP), and government agencies. Unfortunately, for Japan the situation was considerably weaker, particularly because we had no (intellectual) access to Japanese language documents but had to rely solely on English language publications or translations. Another decisive factor is that in the USA, due to legal and regulatory frameworks and constraints, issues relating to the particular situation and needs of older and disabled people are of eminent public policy interest and also have to be taken into account by industry.

In most instances, no directly comparable figures and data for the EU, the USA and Japan are available. This implies that our analysis cannot be relied upon for a quantitative comparison in the strict sense. Rather, the reader has to be content with qualitative comparisons and subjective assessments based on the material collected during the course of the project.

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## Executive Summary

The overall objective of the SeniorWatch project is to support the development of a competitive industry and market across Europe for IST related products and services, both designed-for-all and assisting older people<sup>1</sup> in the 50+ age range, covering all age segments including the "younger" old and the "older" old. The aim is to support market development in a way that best meets the needs of these groups in relation to Information Society Technology (IST) products and services. Earlier research has however shown that the market environment within which the diffusion of IST applications relevant for older and disabled people occurs is quite complex<sup>2</sup>. Different actors are involved (user organisations, policy makers, industry, social services, the end users themselves), and a variety of factors (technological, psychological, sociological, political, economic) influence up-take of IST products and services. Bearing this in mind, the SeniorWatch methodology integrates three different research perspectives into one single approach as follows:

- an environmental perspective (policy-oriented country reports, case studies),
- a supply-side perspective (technology watch) and
- a demand-side perspective (representative user surveys).

Whereas the first report produced within this work package (D5.1) presented a comprehensive, comparative analysis of the situation of older people in the European Union and its respective Member States, of their expectations and needs regarding IST products and services, this report (D5.2) focuses on a global comparison, i.e. it juxtaposes and analyses the European Union situation with that in the United States of America and in Japan. These two countries have been chosen because they are the two of the largest economies in the world; furthermore, the USA is leading in many areas of development and application of ISTs, and the same applies - with respect to general IST applications - to Japan as a prime competitor to the EU in the global market. Also, Japan is faced with challenges similar to Europe regarding the ageing of its society (whereas in the USA the forecasts are less dramatic). For this global comparison, it was however *not* possible to draw on primary market survey data comparable to those collected for all Member States and instead SeniorWatch relied on secondary sources of data and information: We were able to commission national reports for these two countries similar to the ones collected for all Member States, but otherwise data published by the OECD, those available from national sources or published on the WWW was relied upon.

### ***Socio-economic impact of population ageing***

As analysed in chapter two of this report, population ageing has profound implications and consequences for all facets of human life. In the economic area, population ageing will have an impact on economic growth, savings, investment and consumption, labour markets, pensions, taxation and intergenerational transfers. Here, forecasts for the European Union, the USA and Japan are all going in the same direction. However, from the three regions investigated, the USA appears likely to experience the slowest ageing process, and the respective

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<sup>1</sup> In SeniorWatch the term "older people" is used to refer generically to the population aged 50+. See Mochis et al (2000), *The Maturing Marketplace. Buying Habits of Baby Boomers and their Parents*, for a discussion of terminology often used by industry; for example, "older" and "mature" usually refers to people aged 55-64; "elderly" and "seniors" usually refers to those aged 65 years and older.

<sup>2</sup> Cullen K., Robinson S. Telecommunications for older people and disabled people in Europe. Amsterdam: IOS Press, 1997.

economic indicators suggest that its economy may be in the best position to cope with the challenges imposed by its population ageing. Japan seems likely to face the strongest economic pressure as its population is ageing at a faster pace compared with the USA and Europe.

In the social sphere, population ageing affects health and health care, family composition and living arrangements, housing and migration. It is currently under scientific dispute whether or not population ageing as such really results in increasing health care costs. However, undisputed is the fact that changes in the age distribution as measured by dependency ratios will indeed dramatically affect the health systems' burden of health care costs via the dramatically decreasing relative proportion of the population earning an income and paying taxes/social security contributions. In addition, it is expected that the extraordinary growth of the proportion of people aged 80 and over will significantly contribute to the growth of the demand for other social services. The sharp increases in the absolute number of disabled will push up spending on publicly-financed long term care as a portion of each nation's GDP. Here again, Japan is expected to face the strongest pressure with the strongest increase in spending for long term care. In the U.S. the increase of long-term care spending is expected to be lowest while the picture for the EU is quite diverse.

### ***Trends in utilisation of IST***

Economic growth due to technological progress, and in particular IST economy growth, may impact positively on the challenges described above. It has been estimated that more than 70% of the dramatic growth in productivity of the US economy over the last decade can be attributed to Information and Communications Technology (ICT) and the spread of these innovations throughout the economy.<sup>3</sup> Whether this marks a historic trend remains to be seen, and its impact on Europe, at least up to now, has been considerably less. The role IST currently plays - and may play in future – in coping with some of the challenges described above has however many more facets and is not just challenging from the view point of macroeconomic and social concerns. Also, they are challenging from a business point of view. As older people compose a larger proportion of the world population, their role as consumers will gain in importance for IST service and equipment providers. The so-called “senior market” is growing world wide and a “new” senior generation with powerful economic influence is rapidly emerging. European industry will miss a huge business opportunity if these market segments are not adequately addressed. At the same time, older people can be expected to become increasingly influential in lobbying for legislation and regulation relating to IST markets.

The extent to which older people ultimately utilise IST for their purposes is not at least influenced by the extent to which IST has penetrated within their general living environment. As for instance revealed in the earlier analyses of the SeniorWatch survey data<sup>4</sup>, PC penetration among European 50+ households basically follows the same distributions across the Member States as penetration within the general public. Here, the USA has a slight head start with respect to PC and Internet penetration compared with the EU and Japan, and also costs involved in IST usage tend to be lower than in Europe and Japan. However, PC penetration among private households as well as Internet penetration vary considerably across the European Union, and in some Member States penetration levels have been reached that are comparable with those in the US. As regards the mobile arena, mobile telephony is rapidly becoming a complementary access mode in the European Union while Japan and the USA

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<sup>3</sup> For a broader discussion, cf. Varian, Hal et al. (2002): *The Net Impact Study - The Projected Economic Benefits of the Internet in the United States, United Kingdom, France and Germany* (V.2.0) at <http://www.netimpactstudy.com/>.

<sup>4</sup> See SeniorWatch deliverable no. 5.1: Older People and Information Society Technology – A Comparative Analysis of the Current Situation in the European Union and of Future Trends. April 2002, p. 53.

in particular lack behind. Despite the dynamic development of the Japanese market for mobile Internet access which has been driven through the launch of NTT DoCoMo's mobile Internet access system "imode" since the late 1990s, it should not be underestimated that in some European Member States mobile telephony has gained even more in importance than the average penetration figure for the entire European Union suggests. For instance, in Finland and in Portugal households equipped with *only* mobile telephony are rapidly becoming a significant proportion of all households with a telephone connection

When it comes to IST utilisation among older people, again the USA set the benchmark as regards penetration figures for PCs and the Internet. However, some EU Member States show penetration figures that are indeed at the same level than those in the US, and others are expected to catch up according to the SeniorWatch survey results. All in all, European elders already make up a considerable proportion of the overall market for IST applications and devices, and this market segment will grow considerably. Overall, some 32 million Europeans who are today 50 years and older will be on the Web by the end of 2003. Japan in particular lags behind as regards Internet access among its elderly population.

In all three regions, IST utilisation among older people appears strongly connected with socio-economic factors, i.e. it follows the commonly known characteristics of social stratification such as gender, education, income, etc. Also, the prevalence of functional restrictions among older people appears to hamper IST utilisation among this population group in all three regions investigated. In other words, it appears not just as a matter of age as to whether older people want or are able to get involved in IST, rather it is a matter of an overall "social divide". Since the use of digital technologies will continue to play a key role in future Information Society developments there is however a danger of mutual reinforcement. People from disadvantaged social groups who cannot afford access to and usage of ISTs are threatened to fall further behind and to become excluded from Information Society opportunities. This can be understood as an interconnected social process which can be observed in all three regions investigated. However, the cost factor appears to play a lesser role in the USA compared with Japan and Europe.

### ***Policies concerning older people and IST***

There are signs that the 'digital divide' is growing rapidly in Japan and will continue to do so because there is a lack of policy in this area. One measure of this is based on Internet penetration, which has been shown to be dependent on annual income and area of residence. In particular, senior citizens and disabled people are a population with very little interest/opportunities or few incentives to become involved in IST. In contrast, most of the population under the age of 50 is obligated to use the Internet and therefore to learn to use the computer. Moreover, the country is in crisis in terms of its rapidly increasing older population and lack of support to care for this growing group. In principle, there is a considerable market potential for care-related IST applications, but the realities of current home care delivery appear to hamper broader uptake of advanced ISTs in this context. The problem of senior care is now one that confronts Japanese society as a whole and introduction of the new public long-term care insurance scheme does not appear to be effective. The government lacks any significant policy that adequately deals with the problems occurring in homes where family members are caring for their older relatives and under the current situation, the introduction of the new long-term care insurance system does not promote home-based care.

In terms of policy, the USA is the most progressive of all the nations reviewed in this report and the legislative strength and impact on the development of general purpose ISTs and care-related IST (particularly telehealth, tele-homecare, telemedicine, etc.) has been very significant. Several pieces of legislation have highlighted the needs and demands of the senior market, especially those with disabilities, and have persuaded private sector businesses to meet these demands. A further driving force for the implementation of IST among the senior population has been the work of strong lobby groups such as the American Association of Retired Persons. However, despite a superior and highly developed legislative system in

terms of provision and access to ISTs and assistive technology (AT) in particular the US public sector appears not to fare as well as its European counterparts. Currently, the greatest impediment is the lack of financing to fund basic devices for older people at home. In relation to AT, existing laws and policies that fund AT present many gaps that fail to address the needs of many older people and individuals with disabilities. In addition, the laws and policies are frequently misinterpreted or implemented inappropriately by those charged with service delivery. It was reported that Federal agencies and others that implement federal policy (such as states and local agencies) commonly lack the expertise and resources necessary to implement existing AT laws and policies. Consumers are left with the daunting task of learning each system's policies to be able to advocate for the AT they need. There is a distinct need for a Federal policy that is comprehensive, co-ordinated, and consistently implemented at state and local levels to ensure equitable delivery of AT to all individuals who are eligible for services.

Since the mid-1980s onwards, significant political effort has been put into developing strategies and policies in relation to developing a European Information Society, both on the level of the European Union as well as on the level of the individual Member States. One of the objectives of the European Union's strategy is to make sure that Europe's business, governments and citizens continue to play a leading role in shaping and participating in the global knowledge and information based economy. The objective of social inclusion, at least the e-inclusion aspect, is also an integral part of the eEurope Initiative, which was launched by the European Commission in December 1999. A closer look at the general Information Society policies pursued within the individual EU Member States shows that older people are addressed in these policies in different ways, and two countries specifically address and make reference to older people in their general IST policies. Countries without specific policies include older people in other policy areas in particular ensuring access to ISTs through lifelong learning or in relation to the so-called 'digital divide'. Once again e-Europe appears to be a dominant driving force and older people are included as a target group for e-Government initiatives and measures. Other countries have plans in place to close "the digital divide", which include specific targeting of older people, and some refer directly to ISTs in social and/or welfare policy for older and/or disabled people.

European assistive service delivery systems are quite well developed compared with the USA and with Japan in particular. However, the range of equipment covered, eligibility criteria and other aspects vary widely across the European Member States, and recent research<sup>5</sup> revealed that an oligopolistic structure of national AT markets tends to keep prices high and facilitates a situation where AT providers are not very sensitive towards new technological developments. In relation to care-related policy, there is a considerable amount of positive activity in this area on the level of the Member States, with existing and recent policies that address ISTs in general healthcare policy. For those countries that do not directly address ISTs in general healthcare policy, IST-based concrete measures and initiatives exist. However, the picture appears less positive in relation to IST policy in this area addressing older people or family carers. Most countries have no explicit policy or initiatives in relation to the use of ISTs as an empowering tool for family carers, i.e., only two EU Member States make specific reference to the use of ISTs in policy documents empowering family carers

### ***European strengths and weaknesses***

A SWOT analysis presented in chapter four of this report revealed diverse strengths, weaknesses, opportunities and threats with respect to accelerating utilisation of ISTs by older Europeans and by organisations providing care to this group. Taking into account the three

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<sup>5</sup> Price Partnership Limited and Institute for Rehabilitation Research: Study on Technology Trends and Future Perspectives within Assistive Technology, 2000 (available at: [www.cordis.lu/ist/ka1/special\\_needs/library.htm](http://www.cordis.lu/ist/ka1/special_needs/library.htm))

different research perspectives pursued within the SeniorWatch project (demand perspective, supply perspective, policy perspective) these can briefly be summarised as follows.

**Strengths** European strengths - from a demand perspective – concern for instance the general open mindedness towards IST among the older population segments. Overall, about two third of the current 50+ population has positive attitudes in this regard and is interested in learning about new technologies. Moreover, a large proportion (40%) of the current 50+ population has already gained some hands-on experiences with a computer, although the majority may still possess rather rudimentary computer skills. Also, in the care sector decision maker's attitudes towards IST implementation in care delivery processes as well as their expectations as to where the industry is moving in the field of IST are very positive. In general, the European care sector can today be described as very open-minded towards the implementation of innovative, IST-based care solutions.

From a supply perspective, Europe can capitalise on a well developed telecommunications infrastructure and on its technology leadership in key technology areas, e.g. within the mobile arena. Particularly with respect to IST solutions targeting older and disabled people, an abundance of scientific and technological expertise is available for being exploited for the purpose of developing innovative IST-based systems and services. In some "forerunner countries" the 50+ market has already matured to a considerable level, and these markets can be utilised by industry for developing the EU-wide market place. Here, ageing organisation can play an important role through making the demand for adequate products and services visible to industry and by organising market power.

As regards a policy-oriented perspective, the EU-wide knowledge base has significantly been strengthened over the last decade through extensive public funding of RTD projects, awareness rising measures, etc. targeting older and/or disabled people in particular. This includes activities pursued on the EU level, e.g. within subsequent RTD programmes of the Commission of the European Union, but also a range of national initiatives. In general, pan-European policy such as the eEurope initiative is driving national policies concerning participation of older/disabled people in current Information Society developments. Consequently, there is increased political awareness and reform of domestic legislation/regulation concerning older people and ISTs. The public sector is going to lead the way particularly in eAccessibility initiatives and, thus, sets a stimulus for the private sector. As regards care-related ISTs, well developed health care insurance systems are in place in most EU countries which – in principle – offer a framework (e.g. regarding regulatory aspects or with respect to funding/re-imburement issues) to implement IST-based solutions within this arena.

**Weaknesses** There are several constraints that – at least up to now - hamper acceleration of IST uptake among older people and their carers from a demand perspective. These concern for instance, the lack of advanced computing skills among older people and the lack of opportunities to improve their skills compared with younger age groups. This situation considerably impedes older Europeans to fully exploit the potentials IST may generally hold for them. Overall, the EU-wide relative growth rate of first time Internet usage among the 50+ population has been declining during recent years, and this indicates that the pace of Internet uptake among older Europeans is slowing down. Moreover, involvement of older people in ISTs is quite unevenly distributed across the European

Union. There is a considerable north/south gradient in this regards, and the lack of interest/awareness in/of ISTs according to socio-economic stratification fosters the development towards a two tiered society in all Member States. Not at least relatively high telecommunications costs – compared with the USA - tend to prevent many older Europeans from utilising IST-based services for their purposes.

As regards the supply side, market potentials have not yet been adequately addressed by industry. Older people do, for instance, not feel adequately considered by industry as regards their interest in adequate design, and they perceive ISTs merely connected with younger people in the media. Overall, the design-for-all philosophy has not yet gained enough recognition among IST manufacturers and service providers. Moreover, fragmented target markets make it difficult to address the EU-wide market potential for both, general purpose ISTs and care-related ISTs. This concerns for instance cultural and language barriers but also the diversity of care and social systems currently in place. As regards publicly funded RTD projects that have targeted older and disabled people as a specific user group, research findings have in many cases not been successfully transferred into marketable products and services. As regards the AT sector in particular, structural deficits appear to facilitate a situation where suppliers are not very sensitive to technical innovations.

From a policy perspective, lacking co-ordination between different policy lines concerned when aiming at improving IST access/usage among older/disabled people (e.g. telecommunications policy, social policy, health care policy) hampers effectiveness of individual policies pursued in this regard. Moreover, there is lack of co-ordination between EU policies and national policies, and absence of legislation to enforce the private sector to adopt universal design principles has left the issue of accessibility of ISTs to market forces exclusively. Also, procurement and use of accessible ISTs is not considered as a public issues in all Member States. As regards the care sector, the potentials IST generally holds with regard to empowering family carers has not yet been sufficiently recognised within care-related policies pursued within the individual Member States.

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# 1 Introduction

This introduction provides a brief overview of the SeniorWatch project, its aims and methodological approach. First, the social and economic background to the study is discussed and its aims and objectives are outlined. The next section provides a short review of the methodological approach. Finally, the contents of this deliverable will be outlined and placed in context with the other deliverables of work package five.

## 1.1 Background and aims of the SeniorWatch project

There exist widely differing expectations of how the emergence of the Information Society (IS) will affect social and economic life in the industrialised countries. With regard to older citizens, applications of Information Society Technologies (IST) are increasingly seen as an opportunity to develop new products and services particularly useful for and useable by older persons. Such applications are also expected to lead to new supportive tools to cope with the social and economic challenges posed by demographic developments. As reflected in the EU's recent paper on its eEurope initiative, large potential is seen for enriching everyone's life, e.g. by bringing communities closer together or sharing knowledge.<sup>6</sup> Here it is also stated that managing the transformation of the current societies into Information and Knowledge Societies is both an economic and a social challenge. In particular, it needs to be ensured that the information society is cohesive and not divisive. This implies that all Europeans should benefit from the advanced applications that IST potentially offers and not just those who are already digitally literate and live in good economic and healthy situations. This is particularly applicable to older citizens because they missed the opportunity to gain experiences with IST during their working or educational life. As revealed by recent research, older citizens are particularly at risk of being left behind on the "Information Highway".<sup>7</sup>

Current demographic trends also present significant market opportunities. Terms such as "silver market" or "golden market segment" which have been adopted in other economic sectors (e.g. consumer industries) reflect the importance of older consumers in some industry segments. With regard to IST, there are two somewhat different market segments which need to be considered. On the one hand, there is a market for mainstream products and services (telecommunications and computer equipment, online services, multimedia products etc.) in which older and disabled people are - in principle - as interested in as any other user group. Particularly since more and more services and products are now being offered electronically, e.g., via the Internet. In view of demographic developments, European industry would miss huge business opportunities if these population groups were not to be appropriately targeted, e.g., by electronic commerce activities. On the other hand, there is a market for IST-products and services which specifically aim at meeting the particular requirements of older and disabled users - the so-called Care and Assistive Technology sectors. Here the situation is characterised by a high degree of market fragmentation and a preponderance of SMEs.

This is the background against which the SeniorWatch project aims to improve the understanding of the market dynamics of IST-based products and services geared towards older

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<sup>6</sup> CEC (2000): eEurope - An Information Society for All. Communication on a Commission initiative for the Special European Council of Lisbon, 23 and 24 March, Brussels.

<sup>7</sup> This is suggested by literature on Digital Divide in Europe, USA, Japan cited in sections 3.2 to 3.4. and also Mark. N. Cooper: Does the Digital Divide Still Exist?, Consumer Federation of America, May 2002 (accessible at <http://www.consumerfed.org/DigitalDivideReport20020530.pdf>)

people. Its objectives are to support the development of a competitive industry and market across Europe for IST related products and services, both designed-for-all and assisting older people to participate in the Information Society to the fullest extent possible.

## 1.2 Methods applied

Earlier research has shown that the market environment within which the diffusion of IST applications relevant for older and disabled people occurs is quite complex<sup>8</sup>. Different actors are involved (user organisations, policy makers, industry, social services, the end users themselves), and a variety of factors (technological, psychological, sociological, political, economic) influence up-take of IST products and services. Bearing this in mind, the Senior-Watch methodology integrates three different research perspectives into one single approach as follows:

- an environmental perspective (country reports, case studies),
- a supply-side perspective (technology watch) and
- a demand-side perspective (user surveys).

Availability of representative data is a cornerstone in assessing the market potential for relevant applications. Therefore, two separate Europe-wide user surveys were conducted during the early summer of 2001. In order to be able to assess the demand potential for IST applied in the private context - i.e. on those products and services which are predominantly purchased by the end users themselves - representative EU-wide survey data from almost 10,000 citizens aged 50 years and older was gathered through the SeniorWatch Older Population Survey (OPS). In order to assess the demand potential for ICT applications of benefit to the care and assistive technology sector, 500 decision makers from organisations providing care to older people were interviewed EU-wide within the SeniorWatch Decision Maker Survey (DMS).

## 1.3 Contents of this deliverable

Whereas the first deliverable of work package five (D5.1) presented a comprehensive, comparative analysis of the situation of older people in the European Union and its respective Member States, of their expectations and needs regarding IST products and services, this report (D5.2) will focus on a global comparison, i.e. it will juxtapose and analyse the European Union situation with that in the United States of America and in Japan. These two countries have been chosen because they are the two of the largest economies in the world; furthermore, the USA is leading in many areas of development and application of ISTs, and the same applies - with respect to general IST applications - to Japan as a prime competitor to the EU in the global market. Also, Japan is faced with challenges similar to Europe regarding the ageing of its society (whereas in the USA the forecasts are less dramatic).

For this global comparison, it was *not* possible to draw on primary market survey data comparable to those collected for all Member States and instead SeniorWatch relied on secondary sources of data and information: We were able to commission national reports for these two countries similar to the ones collected for all Member States, but otherwise data published by the OECD, those available from national sources or published on the WWW was

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<sup>8</sup> Cullen K., Robinson S. Telecommunications for older people and disabled people in Europe. Amsterdam: IOS Press, 1997.

relied upon. For the USA, relevant data was available from various associations/interest groups, particularly the American Association of Retired Persons (AARP), and government agencies. Unfortunately, for Japan the situation was considerably weaker, particularly because we had no (intellectual) access to Japanese language documents but had to rely solely on English language publications or translations. Another decisive factor is that in the USA, due to legal and regulatory frameworks and constraints, issues relating to the particular situation and needs of older and disabled people are of eminent public policy interest and also have to be taken into account by industry.

In most instances, no directly comparable figures and data for the EU, the USA and Japan are available. This implies that our analysis cannot be relied upon for a quantitative comparison in the strict sense. Rather, the reader has to be content with qualitative comparisons and subjective assessments based on the material collected during the course of the project. For more in-depth research, dedicated research visits to these countries supplemented by primary surveys would be necessary and this empirical approach was far beyond the financial resources available for this study.

Chapter 2 of this report focuses on briefly discussing some of the major, longer-term global population trends. For example, the trends in the prevalence and incidence of various chronic diseases and disabilities and their potential socio-economic impacts on national health and care systems, pension schemes, global financial markets, migration and peace. Such global long-term developments are to be expected in the coming years (up to 2050) and against these, the issues surveyed and analysed by SeniorWatch gain a new, crucially important policy dimension for the European Union and its citizens.

Next, in Chapter 3 the role IST currently plays is analysed - and may play in future - to cope with the challenges discussed in the previous chapter 2. Here, a global perspective is taken by comparing the situation in the European Union with the situation in Japan and in the USA respectively (sections 3.1 to 3.4). This concerns the general IST situation in the three regions investigated (section 3.1), and utilisation of ISTs among older citizens in particular (sections 3-2 to 3-4). Following to this, section 3.5 presents a comparison and benchmarking exercise from a policy perspective between the EU Member States (and Norway), the USA and Japan. The information is presented according to the three main IST application domains (general purpose IST, care-related IST, accessibility-related IST) being investigated in SeniorWatch and includes RTD policy (sections 3.5.1 to 3.5.4).

Chapter 4 provides a summary assessment by bringing together the different strands of information presented in the previous chapters. This allows a “SWOT” approach to be taken and highlights the strengths and weaknesses of the European Union in accelerating the utilisation of ISTs among older citizens and those providing care, as well as highlighting the opportunities and threats faced here.

## 2 Global trends and challenges

This chapter provides a concise and brief overview of the key global trends and challenges facing all developed and developing countries. This overview prepares a background for the IST focused discussion and analysis of the European Union position vis-à-vis the United States of America and Japan, our two leading competitors in global markets presented later in this document. Three key global trends and challenges are discussed under the following headings:

- Population trends
- Diseases and disabilities trends
- Socio-economic impacts

### 2.1 Population trends

When contemplating future likely developments which research, technological developments and policies must consider today, then population trends are a key factor. Forecasts for the next 20 years are highly reliable and projections for up to 50 years are state of the art. In the following sections a brief highlighting of four key aspects of predicted global population ageing is presented and following this, the expected ageing of the European Union population and central characteristics of this process will be discussed in some detail. A review of demographic dependency ratios, the most common figures to describe this change, is also presented for all Member States.

#### ***Global population ageing***

In its report “World Population Ageing 1950-2050” - prepared for the *Second World Assembly on Ageing* in Madrid, ‘Spain, from April 08 to 12, 2002’ - , the Population Division of the United Nations highlights four major findings about global population trends:<sup>9</sup>

1. Population ageing is unprecedented, without parallel in the history of humanity. By 2050, the number of older persons (60 years and older) in the world will exceed the number of young (under the age of 15) for the first time in history.
2. Population ageing is pervasive, a global phenomenon affecting every citizen of the world.
3. Population ageing is profound, having major consequences and implications for all facets of human life. In the economic area, population ageing will have an impact on economic growth, savings, investment and consumption, labour markets, pensions, taxation and intergenerational transfers. In the social sphere, population ageing affects health and health care, family composition and living arrangements, housing and migration. In the political arena, population ageing can influence voting patterns and representation.
4. Population ageing is enduring. At the start of the twenty-first century, the world population included about 600 million older people (10% of the world population), triple the number recorded 50 years earlier (or 8% of the world population in 1950). By mid-century, there will be some 2 billion older persons (21%), once again a tripling of this age group in a

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<sup>9</sup> Population Division of the United Nations (2001), Department of Economic and Social Affairs (DESA): *World Population Ageing 1950-2050*, New York: UN; - Executive Summary, p. xxvii ff.

span of 50 years. - And the pace of population ageing is much faster in developing countries than in developed countries.

*Mutatis mutandis*, these findings also apply to the European Union.

### **Ageing of the European population**

The accelerating<sup>10</sup> ageing process of the European population is characterised by these trends<sup>11,12</sup>:

1. *Life expectancy* at birth is growing: In the EU, it is expected to grow by approximately 5 years up to 2050 to reach about 83 years, similar to many other developed countries, see Table 1. (In Japan, it will even increase by probably 7.5 years, in the USA by 7 years.)

**Table 1: Expectation of Life at Birth (both sexes combined)<sup>13</sup>**

Year	EU	Europe	USA	Japan	Australia	Canada
1960	70.1					
1995 (baseline)	77.2					
(1995-) 2000 (baseline; medium variant)	77.9	73.2	75.5	80.5	79.2	78.5
2015 (baseline)	80.2					
(2045-) 2050 (baseline; medium variant)	82.4	80.8	82.6	88.0	83.0	82.8

Source: See footnote 13

2. *Fertility* rates have been decreasing since the immediate post-war period, and, despite a slow upward trend (see
- 3.
4. *Table 2*), these are expected to remain below the reproduction rate of 2.1 children per woman:

<sup>10</sup> From 2000 to 2015, the EU mean age is estimated to increase from 39.7 to 42.6 years; then the process will slow down to reach a mean age of 46.6 by 2050: Lutz, W. and Scherbov, S. (1999), First probabilistic population projections for the European Union, in: Lutz, W. (ed.). *Compendium of Family Studies in Austria 1999*, Vienna: Austrian Institute for Family Studies, pp. 123-139.

<sup>11</sup> Eurostat and European Commission (2001): *The social situation in the European Union 2000*, Brussels, p. 46.

<sup>12</sup> For detailed data by global regions, see Population Division of the United Nations (2001), Department of Economic and Social Affairs (DESA): *World Population Prospects - The 2000 Revision - Highlights*, New York; for detailed data by country, Population Division of the United Nations (2001), Department of Economic and Social Affairs (DESA): *World Population Prospects: The 2000 Revision, Vol. I, Comprehensive Tables*, New York.

<sup>13</sup> Sources of Data:

a) *EU*: European Commission (1998). *Demographic report - 1997*. Luxembourg, Office for Official Publications of the European Communities: *Baseline* scenario, arithmetic mean of values for men and women. Data for 1960 and 2050: McMorrow, Kieran and Roeger, Werner (1999): "The Economic Consequences of Ageing Populations" (A comparison of the E.U., U.S. and Japan). Economic Papers of the Directorate-General for Economic and Financial Affairs, No. 138. Brussels, Belgium: European Commission.

b) *Other*: Population Division of the United Nations (2001): Values are presented for a five year interval, in our Table 1 only for the *medium variant*.

**Table 2: Estimated and projected total fertility (average of children per woman)<sup>14</sup>**

Year	EU	Europe	USA	Japan	Australia	Canada
1960	2.60					
1995 (baseline)	1.45					
(1995-) 2000 (baseline; medium variant)	1.55	1.41	2.04	1.41	1.77	1.60
2015 (baseline)	1.64					
(2045-)2050 (baseline; medium variant)	1.66	1.81	2.10	1.75	2.02	1.90
	(UN: 1.83)					

Source: See footnote 14

5. The *working age population* is ageing as a result of the diminishing younger incoming generation (fewer people under 15) and the increase of people aged 50 and over (the progressive arrival of the so-called baby boomers of the 1960s). In other words, the proportion of working age population aged 50 and older will increase significantly, while the younger members of the work force aged 15 (or 20) to 29 will decline strongly<sup>15</sup>. It is decreasing from about 2020 onwards as baby boomers progressively retire.
6. The *share of people over 64* has been increasing considerably (1960: 10.6% of total population; 2000: 16%) and will continue to increase (2050: 28%), with an even faster increase - the highest growth rates of all – in the share of those over 79 years.<sup>16</sup>

### Demographic dependency ratios

The main demographic consequences of the trends described above are twofold:

a) the relative number of the “*dependent*” population will rise considerably.

- Conventionally, the ratio relating to the number of young people aged 0-14 and of older people 65 years and older to the number of people aged 15-64 is called the *total dependency ratio - TDR*.
- The *old age dependency ratio - OADR* - (or its reverse value, the *potential support ratio - PSR*<sup>17</sup>) is the ratio relating the population over 64 to the number of people aged 15-64, whereas
- the *youth dependency ratio - YDR* - is the value of the population under 15 to the number of people aged 15-64.

<sup>14</sup> Sources of Data:  
a) EU: European Commission (1998). Demographic report - 1997. Luxembourg: Office for Official Publications of the European Communities: Baseline scenario. Data for 1960 and 2050: McMorrow, Kieran and Werner Roeger (1999). Note: Arithmetic mean of UN data for 15 Member States in 2050 renders a value of 1.83  
b) Other: Population Division of the United Nations (2001): Values are presented for a five year interval, in our

Table 2 only for the *medium variant*

<sup>15</sup> Cf. Lutz, W. and Scherbov, S. (1999), op. cit., on this. - Whereas in UN publications the “working age group” is defined as those 15 to 64 years old, the EU seems to prefer to use the age group 20-59 or 20-64 in this context, see European Commission (1998). Demographic report - 1997, p. 7, where it is also noted: “Activity patterns tend to move progressively away from the stereotype ‘young education, adult employment, older retirement’. This emerging trend renders the choice of the age groups very difficult.”

<sup>16</sup> From 2000 to 2015, the population aged 80 and over will grow by 48%, whereas the share of those aged 65+ by “only” 22%, aged 55-64 by 19%, and the share of the population aged 0-54 will actually decline during this time period: Eurostat and European Commission (2002): The social situation in the European Union 2001, Brussels, p. 114.

<sup>17</sup> Population Division of the United Nations (2001), p. xxix.

Table 3 presents these demographic dependency ratios for all Member States and the EU for the years 2000 and 2050<sup>18</sup>. Whereas in the past (and still in 2000) the younger population accounted for the majority of dependants in the EU (YDR: 0.26; OADR: 0.24), this is forecast to change dramatically by the year 2050: the youth dependency ratio will slightly decline to 0.25, whereas the old age dependency ratio will almost double to 0.47. The overall dependency ratio will increase to a lesser extent from 0.50 to 0.72 or by 44%.

**Table 3: Demographic dependency ratios, EU, 2000 and 2050**

	2000			2050		
	TOTAL*	Old age**	Youth***	TOTAL*	Old age**	Youth***
BELGIUM	0.52	0.25	0.27	0.70	0.44	0.26
DENMARK	0.50	0.22	0.28	0.63	0.38	0.26
GERMANY	0.47	0.23	0.23	0.69	0.47	0.22
GREECE	0.49	0.26	0.24	0.74	0.48	0.25
SPAIN	0.47	0.24	0.23	0.79	0.56	0.23
FRANCE	0.53	0.24	0.29	0.73	0.46	0.27
IRELAND	0.52	0.18	0.34	0.94	0.66	0.27
ITALY	0.48	0.26	0.22	0.78	0.56	0.22
LUXEMBOURG	0.50	0.22	0.29	0.64	0.38	0.26
NETHERLANDS	0.48	0.20	0.27	0.67	0.41	0.26
AUSTRIA	0.48	0.23	0.25	0.68	0.44	0.23
PORTUGAL	0.47	0.23	0.25	0.70	0.44	0.26
FINLAND	0.50	0.22	0.28	0.68	0.42	0.26
SWEDEN	0.57	0.27	0.30	0.66	0.38	0.28
UK	0.53	0.24	0.29	0.69	0.43	0.26
EC15	0.50	0.24	0.26	0.72	0.47	0.25

\* *Total Dependency Ratio* = (Population under 15 or above 64) / (Pop. aged 14-64)

\*\* *Old Age Dependency Ratio* = (Population above 64) / (Pop. aged 15-64)

\*\*\* *Youth Dependency Ratio* = (Population under 15) / (Pop. aged 15-64)

Source: McMorrow, Kieran and Werner Roeger (1999), *Appendix: Member States Analysis, Table 1.*

Although global and European population trends are all moving in the same direction, the disparity amongst Member States will increase. For example, in 2000 the total dependency ratio varied from 0.47 (in Germany, Portugal and Spain) to 0.57 (in Sweden) or by 21% (above the lower value), in 2050 it will increase from 0.63 in Denmark to 0.94 in Ireland or by almost 50%. In 2000; the OADR was 0.27 or 50% higher in Sweden than the value of 0.18 in Ireland, and in 2050 it will have risen in Ireland to 0.66 (74% above the lowest value), whereas then Sweden, Denmark and Luxembourg will show with 0.38 the lowest value in the Union.

b) While the population forecasts for the next 20 years are assessed as relatively reliable<sup>19</sup>, the second consequence relating to *informal/family carers* is somewhat uncertain<sup>20</sup>:

<sup>18</sup> McMorrow, Kieran and Werner Roeger (1999), "The Economic Consequences of Ageing Populations" (A comparison of the E.U., U.S. and Japan). Economic Papers of the Directorate-General for Economic and Financial Affairs, No. 138. Brussels, Belgium: European Commission.

<sup>19</sup> For longer term forecasts, the assumptions about fertility rates and migration could be highly unreliable.

<sup>20</sup> Cf. Eurostat and European Commission (2001): *The social situation in the European Union 2000*, Brussels, p. 47.

- Considering the carers of the decreasing *younger generations*, it is likely that the generations of their parents and grandparents will be under less pressure.
- On the other hand, an ageing population will need considerably more informal/family carers if health and care systems are to remain sustainable. This is particularly the case amongst the fastest growing population segment of *those 80 years and older* who are most in need of supportive care at home and in institutions. Though in most Member States this age group will still have on average more than two children to rely on over the next two decades, this situation will deteriorate dramatically in the longer run.
- This development and the resulting supply and demand of care may be accentuated by population movements and age-specific migratory patterns in the EU regions. "These are factors that cannot be neglected in the estimation of future social services provision".<sup>21</sup>

## 2.2 Trends in diseases and disabilities

On a global scale, the relationship between ageing societies and health has gained increasing attention. "Health trends in the next 25 years will be determined mainly by the ageing of the world's population ..."<sup>22</sup>. According to the *Global Burden of Disease Study*, in the so-called established market economies (EME), chronic diseases like neuropsychiatric disorders, cardiovascular disorders, malignant neoplasms (cancers), respiratory disorders and musculoskeletal disorders (in this order) will account for the vast majority of so-called disability-adjusted life years (DALYs) lost<sup>23</sup>. For the EU, similar trends have been observed in the past and can be expected to continue in this century. "For all EU Member States the 20<sup>th</sup> Century 'epidemiological transition' has marked the emergence of degenerative disorders, especially cardiovascular disease and neoplasms, as the main causes of death rather than infectious diseases, a change which is associated with a rise in standard of living and with public health measures"<sup>24</sup>.

However, at the same time it can be observed that the health of older people has steadily improved. "In the last quarter of this century, older people have made substantive health gains. Explanations for this vary and may be interactive including improvements in health education, health services, medicine, public health and standard of living"<sup>25</sup>. Forecasts predict that this will continue in the future, however whether the age-specific health status will remain constant or change - and in which direction - remains to be seen. Progress in medical technology cuts both ways in terms of the average health status of older people: "While it is reasonable to assume that some elderly will be healthier and have health status equivalent to that of younger individuals in the previous generation, others may survive into the older age cohorts because of improved medical technology, but their health status may still be relatively poor for their age"<sup>26</sup>.

<sup>21</sup> Eurostat and European Commission (2001): *The social situation in the European Union 2000*, Brussels, p.46.

<sup>22</sup> Murray, CJL, and Lopez, AD. (1997) Alternative projections of mortality and disability by cause 1990-2020: Global Burden of Disease Study, in: *The Lancet*, 349 (May 24), p. 1498. Other factors are mentioned: "The decline in age-specific mortality rates from communicable, maternal, perinatal, and nutritional disorders, the spread of HIV, and the increase in tobacco-related mortality and disability."

<sup>23</sup> Ibid., p. 1501.

<sup>24</sup> Mestheneos, E. et al. (1999) *The health of older people in the European Union: current state and future trends*. Report prepared for the CEC, DG V (Public Health). Athens, published at <http://www.sextant.gr/HOreport/HOreport.htm> (accessed June 08, 2001).

<sup>25</sup> Ibid., Appendix 2: Trends in cause specific mortality in the EU amongst older people, p. 155.

<sup>26</sup> Shoven JB et al. (1994) The impact of the demographic transition on Government spending, in: Wise, DA (ed.) *Studies in the Economics of Aging*. National Bureau of Economic Research. Chicago and London: University of Chicago Press, pp. 13.37. Cited by England, Robert S. *The Fiscal Challenge of an Aging Industrial World*. - A

Health and *disabilities* are closely related, and disability rates are also declining across the industrial world. In a 1998 study<sup>27</sup>, the OECD examined the question of whether declining mortality rates were also accompanied by a healthier elderly population. The study built on the work of Manton, who had found in a 1997 study that disability rates were declining in the U.S., contrary to forecasts in the 1980s, and that the decline was accelerating.<sup>28</sup> The OECD study found that severe disability had declined in nine of its member countries between 1990 and 1994. The gains are mainly found in younger age groups (65-80) and are greater for men than women. The study also found that the decline was pronounced in private households.

However, since more elderly are being taken out of institutions and being given home health care, the rate of disability has risen in the *institutionalised* population. Four countries had significant gains: France, Germany, Japan and the U.S. There were mixed results in Canada and Sweden while Australia, the Netherlands and the U.K. had very moderate or no gains.

While the disability rates are declining, the *total number of disabled persons* will rise because of the huge demographic shift in the coming half century. The OECD found that Japan would see a 74% increase in the number of elderly living in institutions by 2020. (This projection was before Japan introduced government insurance for long-term care in 2000.) Canada would see a 61% increase while the growth would be 33% in the U.S. Other European nations were forecast to have lower growth rates: Germany, 26%; France, 29%; the U.K., 18%; Sweden, 27%. The number of disabled living at home is set to grow even faster. For example, a forecast for a 74% rise of disabled elderly in Japan between 2000 to 2020<sup>29</sup>; in Canada this is forecast at a 62% increase and in the U.S., a 41% jump; Germany, 38%; France, 54%; Sweden, 29%.

## 2.3 Socio-economic impacts

Both population trends and trends in the incidence and prevalence of (chronic) diseases and disabilities will have profound socio-economic impacts on all aspects of our economies and societies. In this section, economic dependency ratios for the EU up to the year 2050 are presented, which are a key indicator for the economic impact to be expected. This is followed by a short discussion of selected issues and topics relating to socio-economic and global policy implications.

### ***Economic dependency ratios***

The probably most important impact of the ageing of our societies lies in the economic sphere: In future, fewer and fewer people will be economically active as participants in the *labour force* and thereby increase the value-added produced in the respective (national) economy. It is only those who are in employment (as employer, employee or free-lancer) who are financing taxes and social transfers to the non-active population. And this economic burden on current labour is much heavier for countries with low employment rates.

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White Paper on Demographics and Medical Technology. Washington, DC: Center for Strategic and International Studies - Global Aging Initiative, p. 65. - See also our discussion in Section in 2.3.2 below.

<sup>27</sup> Jacobzone, S. and E. Cambois, E. Chaplain, J. M. Robine (1998), "The Health of Older Persons in OECD Countries: Is It Improving Fast Enough To Compensate For Population Ageing?" Labour Market and Social Policy – Occasional Papers No 37. Paris: Organisation for Economic Cooperation and Development.

<sup>28</sup> Manton, K.G., L. Corder and E. Stallard (1997), "Chronic Disability Trends in Elderly United States Populations, 1981-1994," Proceedings of the National Academy of Science, Vol. 94, pp. 2593-2598.

<sup>29</sup> England, Robert S. (2001): *The Fiscal Challenge of an Aging Industrial World. - A White Paper on Demographics and Medical Technology*. Washington, DC: Center for Strategic and International Studies - Global Aging Initiative, p. 73.

A standard measure for this is the so-called economic dependency ratio (EDR) which relates the number of people aged 14 or younger plus the people aged 65 and older to the number of people aged 15 to 64 who have employment or are looking for employment. Two rates are distinguished:

- The *Potential Economic Dependency Ratio (PEDR)* = (Population under 15 or above 64) / (Labour Force) and
- The *Effective Economic Dependency Ratio (EEDR)* = (Population under 15 or above 64) / (Employment)

**Table 4: Economic dependency ratios, EU, 2000, 2025 and 2050**

Member State	2000		2025		2050	
	Potential*	Effective**	Potential*	Effective**	Potential*	Effective**
BELGIUM	0.84	0.93	1.01	1.11	1.13	1.25
DENMARK	0.62	0.67	0.72	0.78	0.79	0.86
GERMANY	0.69	0.75	0.83	0.91	1.01	1.11
GREECE	0.82	0.89	0.96	1.05	1.23	1.34
SPAIN	0.77	0.98	0.87	1.10	1.30	1.65
FRANCE	0.79	0.91	0.93	1.08	1.09	1.26
IRELAND	0.84	0.93	0.99	1.10	1.51	1.67
ITALY	0.80	0.91	0.97	1.10	1.30	1.47
LUXEMBOURG	0.81	0.63	0.93	0.73	1.04	0.81
NETHERLANDS	0.68	0.73	0.84	0.91	0.95	1.03
AUSTRIA	0.67	0.70	0.77	0.80	0.95	1.00
Portugal	0.67	0.72	0.75	0.80	0.98	1.05
FINLAND	0.68	0.80	0.90	1.06	0.94	1.10
SWEDEN	0.72	0.80	0.80	0.89	0.83	0.92
UK	0.71	0.77	0.78	0.85	0.91	0.99
EC15	0.75	0.85	0.88	1.00	1.09	1.24

\* *Potential Economic Dependency Ratio* = (Population under 15 or above 64) / (Labour Force)

\*\* *Effective Economic Dependency Ratio* = (Population under 15 or above 64) / (Employment)

Source: McMorrow, Kieran and Werner Roeger (1999), Appendix: Member States Analysis, Table 2

For all Member States, the respective values are presented in Table 4. From this table it is shown that in 2000 the difference between Member States is considerable, with a low value of 0.63 for Luxembourg and a high value of 0.98 for Spain for the EEDR. In other words, currently in Spain one active worker has to support one child or older person, whereas the value for Luxembourg amounts to only 64% of the Spanish ratio. By 2050, Ireland is expected to have the highest ratio with 1.67 (a dramatic increase by 80% compared to 2000), and for Luxembourg still a relatively low value of 0.81 is forecasted (only 48% of the Irish value, i.e. again the discrepancies between Member States are expected to increase over time).

### **Socio-economic consequences**

The developments illustrated in the above sections will have a considerable impact on a wide variety of socio-economic issues globally, and particularly in the EU, and they may even endanger the economic sustainability of our economies and social systems. Besides their fundamental impact on the labour force as discussed above, various other areas are commonly

highlighted in this context. Here we can only briefly touch upon some of them, and the interested reader is referred to the literature cited and the sometimes very controversial results and discussions - for the time being mostly in scientific circles, but more and more also in the policy arena.

**Economic growth:** A declining labour force implies, *ceteris paribus*, a lower or even negative economic growth and the produced goods and services have to be distributed amongst a (relatively) growing number of dependent people, i.e. there will be a negative impact on living standards. Indeed, "population aging is expected to lead to a slower and more frail global economy. In the years between 2025 and 2050, Europe's potential growth rate is expected to fall to only 0.5%, Japan's to 0.6%, and the U.S. to 1.5%"<sup>30</sup>. Sluggish economic growth will likely reduce return on investment for many sectors of the economy. Lower growth potential will also dampen equity prices"<sup>31</sup>.

**Pension systems and capital markets:** One opportunity to counteract the negative effect on the labour force could be to increase savings rates leading to higher productive investments and growth emanating from a rising capital stock. Both greater human and physical wealth holdings would increase the options available for coping with the adverse economic effects of ageing.<sup>32</sup> But whether this will happen must be doubted. Initially, population ageing will push up cash flows into pension plans, but this is expected to be reversed within about 15 years, and by the mid-2020s funded pension systems are forecast to be required to sell assets. In the USA, which in 1999 accounted for 59% of the world's pension assets, pension plan dissaving may reach 1.5% of payroll by 2040 and 4% by 2065.<sup>33</sup> For countries with pay-as-you-go (PAYG) pension systems the situation will become even more severe, as changes to asset-based systems or higher government debts are unavoidable, which again are expected to have negative impacts on taxes, growth, living standards and/or capital markets. "Government spending on pensions will rise by 9 percentage points of GDP in Japan by 2050, 5.25% of GDP in the European Union, and 2.75% of GDP in the U.S."<sup>34</sup> "Left unbridled, in terms of policy corrections, the budget deficit and debt implications of these developments would quickly reach unsustainable proportions."<sup>35</sup>

**Technical progress:** One of the great hopes to be able to cope with all these challenges in a better way is the impact on economic growth of technical progress and the "New Economy". Although some believe that "generally speaking, young countries are more lively, energetic, and dynamic than others"<sup>36</sup>, i.e. an ageing labour force is expected to be less dynamic and innovative, others have suggested that investment priorities may be changing with population ageing. When the foreseen developments increase the incentive for human capital

<sup>30</sup> Turner, Dave, Claudio Giorno, Alain DeSerres, Ann Vourc'h and Peter Richardson (1996): *The Macroeconomic Implications of Ageing in a Global Context*. Economics Department Working Paper No. 193. Paris: Organization for Economic Cooperation and Development (OECD).

<sup>31</sup> England, Robert S. (2001): *Hard Landings. - A White Paper on the Financial Markets Impact of Population Aging*. Washington, DC: Center for Strategic and International Studies - Global Aging Initiative, p. 3.

<sup>32</sup> McMorrow, Kieran and Werner Roeger (1999), pp. 25-26.

<sup>33</sup> England, Robert S. (2001): *Hard Landings*, p. 3.

<sup>34</sup> England, Robert S. (2001): *A New Era of Economic Frailty? - A White Paper on the Macroeconomic Impact of Population Aging*. Washington, DC: Center for Strategic and International Studies - Global Aging Initiative, p. 47.

<sup>35</sup> McMorrow, Kieran and Werner Roeger (1999), p. 39

<sup>36</sup> Takayama, Noriyuki (1997), "Japanese and American Social Security Systems: Grappling with the Future," Speech and discussion given at Japan Information and Culture Center, Embassy of Japan, Washington, D.C., March 24, as cited by England, Robert S. (2001): *A New Era of Economic Frailty?*, p. 24. On p. 84 he notes: "Technical knowledge is generated primarily by young workers; the majority of Nobel prizes for instance, are awarded for scientific performance produced before the age of 32."

investment, then societies would indeed redistribute their funds away from physical towards human capital, “with potentially favourable long-run effects in terms of economic growth.”<sup>37</sup>

“The New Economy” is a popular term referring to the Information Society Technology (IST) sector, the Internet and e-Business. From 1995 to 2000, labour productivity in the USA has been surging, from about 1.4% during the period 1974-1995 to about 2.5% recently. It has been estimated that more than 70% of this dramatic change can be attributed to information and communications technologies and the spread of these innovations throughout the economy.<sup>38</sup> Whether this marks a historic trend remains to be seen, and its impact on Europe, at least up to now, has been considerably less. In more tightly regulated economies, adjustments to the New Economy may be harder to manage. Nevertheless, “if the New Economy could boost productivity in Europe and Japan as it has in the U.S it could change things dramatically. If the long-term growth rates accelerated by 0.50% it could effectively counter the impact of aging in Europe and Japan. Of course, it would seem to be fairly optimistic to assume that the magic of the New Economy would last long enough to fully counter the worst effects of aging. It is more likely it will have run its course by the time the aging effect begins to kick in more strongly after 2020 to 2025.”<sup>39</sup> But this clearly underlines why in the longer run IST products and services, both within the IST sector itself and through the diffusion of IST innovations throughout the whole economy, must further on remain a key policy concern.

**Education:** Savings in education spending due to lower numbers of children are not expected to provide any significant budget savings for governments.<sup>40</sup> Quite the contrary, some of the considerations discussed above would suggest to drastically increase investments in human capital, i.e. “the knowledge, information, ideas, skills, and health of individuals.”<sup>41</sup> Skilled workers, managers and innovative entrepreneurs are needed to produce efficiently, to develop new products and services, to utilise innovations from around the globe. And web-based distance learning, particularly for adults, can revolutionise the system of teaching and learning.

**(Im)migration policies:** Already since 1989, net migration has been the main component of annual population change in the EU. In 1999, about 70% of total population growth was accounted for by net migration (at a rate of 1.9 persons per 1000 citizens).<sup>42</sup> Immigration policies are a strategic element in the labour market policies of various developed countries (e.g. USA, Canada, Australia), and also in the EU issues around migration with all their positive and negative associations are gaining in significance. Selected Member States are already adapting their migration policies to cope with various deficits in specific professions and skills. Other aspects concern labour force aspects in general (improvements in the dependency ratios) and meeting the increasing demand for care for older people in particular in view of the decreasing supply of family carers and health care staff. Also, it must not be overlooked that there is a growing “brain drain” of highly-qualified people, both advanced students and professionals - predominantly in the fields of science and engineering -, from the EU towards the USA.<sup>43</sup> In view of what has been discussed above with respect to technical change and education, this is a particularly worrisome development.

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<sup>37</sup> For a broader discussion of these issues and further references see: McMorro, Kieran and Werner Roeger (1999), p. 26-27.

<sup>38</sup> For a broader discussion, cf. Varian, Hal et al. (2002): *The Net Impact Study - The Projected Economic Benefits of the Internet in the United States, United Kingdom, France and Germany* (V.2.0) at <http://www.netimpactstudy.com/>.

<sup>39</sup> England, Robert S. (2001): *A New Era of Economic Frailty?*, p. 83.

<sup>40</sup> *ibid.*, p. 47.

<sup>41</sup> Becker, G. S. (2001): *The Age of Human Capital*, at: [www-hoover.stanford.edu/homepage/books/fulltext/ed21st/3.pdf](http://www-hoover.stanford.edu/homepage/books/fulltext/ed21st/3.pdf). See also Becker, Gary S. (1993) *Human Capital*. Columbia University Press, 3d edition.

<sup>42</sup> Eurostat and European Commission (2002): *The social situation in the European Union 2001*, Brussels, pp. 7, 24-25, 29 ff..

<sup>43</sup> *ibid.*, p. 31.

**Family/household structure:** Changes in household type and family size and structure have been very significant in the past, and will continue to change in future. In 1981, the average family size in the EU was 2.8, and till 1999 it had declined to 2.4 (with Member State figures ranging from 2.1 to 3.1). The increasing number of older people, changing fertility and the growth in divorce rates are the main factors behind this trend.<sup>44</sup> More older people, particularly those in age groups 80+, will live alone, with a clear declining share from north to south in the Union. All of this is expected to increase the demand for (social) care as the number of informal (unpaid, mostly female family) carers declines.

**Health and social care systems:** Above-average (as a percentage of GNP) increases of health system costs have been an issue in most developed countries in recent decades, quite independent of the national health care system and its financial basis (taxes/government budget, private or public insurance, private payments), and it can be expected that the pressure to constrain these costs will continue.<sup>45</sup> Three major factors driving health care costs have been identified:<sup>46</sup>

- changes in real benefits
- changes in relative prices (price of medical care relative to other goods)
- demographic change.

Up to now, evidence<sup>47</sup> indicates that changes in real benefits (better services, enlarged supply<sup>48</sup>) account for 50% or more of the increase in health care costs, whereas demographic change has played only a smaller role.

Whether *ageing as such* has already driven or will drive up *per capita* health care cost is not obvious. On the one hand, it is observed that “available evidence indicates strongly that recent improvements in life expectancy are not matched by increases in health expectancy or reductions in morbidity. The frequency, severity and treatment complexity associated with disease increase with age, as does the incidence of chronic illness requiring extended treatment. In addition, to the extent that population ageing is influenced by reductions in specific mortality risks, it may be that those surviving to old age are systematically less fit (more prone to disease) than those in the same cohorts in the past.”<sup>49</sup> In stark contrast to this, Zweifel et al.<sup>50</sup> suggest that the observed relationship between age and per capita health care expenditure (HCE) “is in fact a relationship between increasing age-specific mortality and the high cost of dying.”<sup>51</sup> Based on a thorough microeconomic analysis of individual health care data, they conclude “that the terminal phase of life is costly independent of whether they occur at age 60 or 90. Consequently, per capita HCE is not necessarily affected by the ageing of the population due to an increase in life expectancy.”<sup>52</sup>

Undisputed is the fact that changes in the age distribution as measured by dependency ratios will indeed dramatically affect the health systems’ burden of health care costs via the

<sup>44</sup> Ibid., p. 25.

<sup>45</sup> In the EU, health care spending nearly tripled relative to the increase in GDP, from 2.5% in 1960 to 6.75% in 1995.

<sup>46</sup> Cave, Jonathan and Panis, Constantijn (1996): “Health Care Costs of an Aging Population”. RAND Europe, Study for the European Commission, DG V, p. II-36. See also [www.rand.or/randeurope/fields/healthproj.html](http://www.rand.or/randeurope/fields/healthproj.html)

<sup>47</sup> Ibid. See also McMorrow, Kieran and Roeger, W. (1999), p.16.

<sup>48</sup> Fee-for-service systems, e.g., “provide greater incentives for high-technology treatment and weaker incentives for cost-containment than pure capitation”, Cave, Jonathan and Panis, Constantijn (1996), p. II-38.

<sup>49</sup> Ibid., p. II-37.

<sup>50</sup> Zweifel, P. et al. (1999): Ageing of Population and Health Care Expenditure: A Red Herring?, in: *Health Economics* 8: 485-496.

<sup>51</sup> Ibid., p. 486.

<sup>52</sup> Ibid., p. 493.

dramatically decreasing relative proportion of the population earning an income and paying taxes/social security contributions.

In addition, it is expected that the extraordinary growth of the proportion of people aged 80 and over will significantly contribute to the growth of the demand for other social services. The sharp increases in the absolute number of disabled will push up spending on publicly-financed long term care as a portion of each nation's GDP. Japan would face a 102% increase in spending between 2000 and 2020, rising from 0.75% to 1.54%. Canada would see a 48% increase in long-term care spending, from 0.5% to 0.81% of GDP. In the U.S. long-term care spending would rise 21%, from 0.68% to 0.82% of GDP. In Germany, it would rise 38%, from 0.71% to 1.02% of GDP. In France, it would rise 51%, from 0.60% to 0.98% of GDP.<sup>53</sup>

"In conclusion, it's clear that forecasts on health care spending and long term care are going to be highly uncertain for the foreseeable future. A number of trends could drive the costs higher than official projections. Indeed, most of the risk seems so to that costs will be higher, not lower. In this case, it's prudent for nations, health care providers and individuals to consider how to prepare for the chance that spending will be higher, perhaps sharply higher than official projections."<sup>54</sup> Considering that, on the one hand, population ageing will have a negative effect on economic growth, and, on the other hand, that at least a considerable part of the remaining growth may have to be devoted to financing pension, health and social security programmes, the social explosiveness of these developments should be obvious.

### **Global policy implications**

In addition to each of the aspects mentioned in the previous section, which are particularly relevant in the SeniorWatch context, a variety of other issues and implications also need to be considered. Amongst others, the following concerns should be considered:

- the attitudinal change needed to start thinking of older people not as a burden but as a valuable resource whose experience and knowledge can be tapped (both as paid employees and as volunteers) for the benefit of society,
- a better retention of older people in the workforce<sup>55</sup>,
- the allocation of wealth and the redistribution of income through taxation and social security systems between the old and the young,
- an early, basic and long-term realignment and consolidation of social security systems (health and care, unemployment, pension) and government debts which already now overburden the younger generations<sup>56</sup> and, if left unchanged, will in the longer term lead to serious social conflicts,
- instability in less-developed regions due to the so-called "youth bulge"; regions the economies of which are characterised by slow growth resulting in stagnant or even declining per capita income, high unemployment and few resources for modernisation, also resulting in
- global migration currents,

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<sup>53</sup> England, Robert S. (2001): *The Fiscal Challenge of an Aging Industrial World*, p. 73.

<sup>54</sup> Ibid.

<sup>55</sup> In Germany, more than 50% of companies do no longer employ persons aged 50+.

<sup>56</sup> Using intergeneration accounting, Prof. Bernd Raffelhueschen, Universities of Freiburg, Germany, and Bergen, Norway, estimates that the German Public debt already amounts to 254% of GDP. If social security systems are not changed, he expects that up to 2/3 of income will have to be allocated to fund them in the longer run. "Das Sozialsystem geraet aus den Fugen", in: *Sueddeutsche Zeitung*, Jan. 14, 2002.

- endangering of global security and peace because of the reduced economic performance of developed countries and a “growing scarcity of funds available for modernizing Western military establishments,” which are forecast to result in an “erosion of the industrial democracies’ military capabilities and global presence”<sup>57</sup>,
- the expected political influence on new laws and regulations senior associations and age-based parties may gain in modern democracies once older people build stronger interest and lobbying groups.

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<sup>57</sup> Goure, Daniel (2000): *International Security and the Aging Crisis* - A White Paper on Defense for the Global Aging Initiative. Washington, DC: Center for Strategic and International Studies - Global Aging Initiative, p. 2.

### 3 Older people and IST – A comparison between the European Union, Japan and the USA

As discussed in the previous chapter 2, the phenomenon of the “greying society” can be observed around the world, and this inevitably results in a number of fundamental socio-economic challenges that most societies will face in the decades to come. As regards IST, there are several implications resulting from this.

Firstly, despite the fact that disability rates are declining in relative terms the total number of disabled citizens will considerably rise because of the huge demographic shift during the coming half century, and the number of disabled citizens living at home will grow at an even faster pace. If an increasing number of day-to-day transactions are performed over digital networks, people who do not have access to these networks - due to functional restrictions – will in the longer run experience fundamental disadvantages in daily living, health, communications and well being. Therefore, it is of utmost importance to ensure broadest possible access to IST services and products to all population groups if the emerging knowledge-based society is supposed to rest on broad acceptance in society.

Secondly, it will become increasingly difficult to finance present pay-as-you-go pension, social and health care systems as fewer and fewer people will be economically active as participants in the labour force. At the same time, the population segment which is most in need of support and care (the 80+) is growing the fastest and, thus, demand for care can be expected to rise considerably in the future. Cost-efficiency and -effectiveness of service provision will therefore increasingly gain importance within the social/health arena, and IST has the potential to make a significant contribution in this regard. Incorporation of IST into care delivery processes can considerably increase productivity in the social/health sector. As indicated by the results of the SeniorWatch survey of decision makers in the EU home care sector, care providers have indeed recognised the potential IST generally holds for improving quality and efficiency of the services they provide<sup>58</sup>.

Thirdly, the demographic developments described in chapter 2 are not just challenging from the viewpoint of social and ethical concerns, they are also challenging from a business point of view. As older people compose a larger proportion of the world population, their role as consumers will gain in importance for IST service and equipment providers. The so-called “senior market” is growing worldwide and a “new” senior generation with powerful economic influence is rapidly emerging. As revealed by the SeniorWatch Older Population Survey, the EU-wide 50+ Internet market is for instance heading for 60% growth (basis: 2001) by the end of 2003 (some 12 million potential new customers). Many of these new users will have particular requirements relating to the age-related functional restrictions they suffer from and this does not only concern the older age cohorts<sup>59</sup>. European industry – including SMEs - would miss huge business opportunities if this customer segment was not appropriately targeted, and there are considerable opportunities to enter new markets outside Europe.

At the same time, older people can be expected to increasingly become influential in lobbying for legislation and regulation relating to IST markets. As the involvement of US American lobby groups such as the AARP (American Association of Retired Persons) in the implementation process of anti-discrimination and telecommunications legislation/regulation vividly illustrates, well organised ageing groups can be expected to increasingly become capable of

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<sup>58</sup> For details see the results of the SeniorWatch Decision Maker Survey presented in D5.2: Older People and IST – A Comparative Analysis of the Current Situation in the European Union and of Future Trends, April 2002.

<sup>59</sup> For details see the results of the SeniorWatch Older Population Survey presented in D5.2: Older People and IST – A Comparative Analysis of the Current Situation in the European Union and of Future Trends, April 2002

influencing governmental decisions as the group of people they represent steadily grows in number.

With this information in mind, this chapter aims at analysing the role IST currently plays and may play in future to cope with the global challenges analysed in the previous chapter 2. Here, a global perspective is taken by comparing the situation in the European Union with the situation in Japan and in the USA respectively (sections 3.1 to 3.4). This allows finally a “SWOT” approach to be taken in order to highlight strengths and weaknesses of Europe and the opportunities and threats faced here (section 3.4).

### 3.1 General IST situation

A first measure for a country’s readiness for its citizens to utilise telecommunications-based services and products is the availability of an appropriate telecommunications infrastructure. Here, availability of - at least - a fixed analogue telephone line (POTS) is as a prerequisite for accessing IST-based services such as for instance the Internet or remote alarms.

Concerning telephone usage the data available provide us with two important results. First, fixed telephony is approaching saturation in all three regions investigated, and the overwhelming majority of the citizens has – at least in principle - access to telephone at home (Table 5). In the USA, some 94% of all households possess a fixed telephone, and - with 92% and 96% respectively - the EU and Japan have an equally high household penetration. As regards telephone lines - with 70 lines per 100 inhabitants - the USA have a slight head start compared with Japan (58 lines per 100 inhabitants) and the European Union (56 lines per 100 inhabitants).

A second important result is that mobile telephony is rapidly becoming a complementary access mode in the European Union while Japan and the USA in particular lack behind as regards mobile telephony. In the EU there are currently some 62 mobile telephones per 100 inhabitants while in Japan only 47 out of 100 inhabitants possess a mobile telephone, and with 40 mobile phones per 100 inhabitant in the USA, the penetration level is even lower. As regards the Japanese market in particular, the launch of NTT DoCoMo's mobile Internet access system "imode" has been driving a dynamic development of the Japanese market for mobile telephony since the late 1990s, and the exponential growth in mobile Internet usage reflects NTT DoCoMo's global leadership in this technology (see also section 3.4). Nevertheless, it should not be underestimated that in some European Member States mobile telephony has gained even more in importance than the average penetration figure for the entire European Union suggests. For instance, in Finland (18%) and in Portugal (12%), households equipped with *only* mobile telephony are rapidly becoming a significant proportion of all households with a telephone connection (Table 6).

Table 5 IST penetration among the general population

	EU	USA	Japan
Penetration of fixed telephones at home in %	92 <sup>60</sup>	94 <sup>61</sup>	96 <sup>62</sup>
Main telephone lines per 100 inhabitants (2000) <sup>63</sup>	55	69	58
Mobile phones per 100 inhabitants (2000) <sup>64</sup>	62	40	47
% of households having a PC (2000) <sup>65</sup>	38	51	50
Estimated no. of PCs per 100 inhabitants (2000) <sup>66</sup>	32	58	31
No of Internet users per 100 inhabitants <sup>67</sup> (2001)	30	61	31
Proportion of Enterprises with Internet access (1999) <sup>68</sup>	63	68	78
No. of installed ISDN bearer channels (64 kbits/s) in thousands (2002) <sup>69</sup>	66 <sup>70</sup>	23	32
DSL penetration per 100 inhabitants (2000) <sup>71</sup>	0.17	0.89	0.01
% of households connected by cable-TV networks (1999) <sup>72</sup>	40	67	17

Source: various

<sup>60</sup> Gallup 2000 - The situation of telecommunications services in the regions of the European Union

<sup>61</sup> Universal Service Administration Company ([www.universalservice.org](http://www.universalservice.org)) as reported in SeniorWatch Country Report USA, p.21.

<sup>62</sup> M. Minges: Measuring Access to Telecommunications: Universal Service and Access Indicators, 1999. Telecommunication Development Bureau, Document WTIM99/4-E.

<sup>63</sup> Source: [http://www.itu.int/ITU-D/ict/statistics/at\\_glance/basic00.pdf](http://www.itu.int/ITU-D/ict/statistics/at_glance/basic00.pdf)

<sup>64</sup> Source: Information Society Statistics - Pocketbook 2001

<sup>65</sup> Source: Information Society Statistics - Pocketbook 2001 & Japan, Statistics Bureau and Statistics Centre: <http://www.stat.go.jp/english/data/it/zuhyou/e04.xls>.

<sup>66</sup> Source: [http://www.itu.int/ITU-D/ict/statistics/at\\_glance/Internet00.pdf](http://www.itu.int/ITU-D/ict/statistics/at_glance/Internet00.pdf) (International Telecommunication Union).

<sup>67</sup> Source: Information Society Statistics - Pocketbook 2001.

<sup>68</sup> Source: Information Society Statistics - Pocketbook 2001.

<sup>69</sup> Source: European Information Technology Observatory, 2002

<sup>70</sup> Because of the lack of comparable data for the EU this figure relates to "Western Europe", i.e. it includes the EU Member States, Norway and Switzerland.

<sup>71</sup> Source: OECD - The development of broadband access in OECD-Countries, 2001

<sup>72</sup> Source: OECD - The development of broadband access in OECD-Countries, 2001

**Table 6 General population equipped with standard and/or mobile telephone in %, EU, 1999**

	Fixed only	Mobile only	Fixed & mobile	All	None
B	58	7	30	94	6
DK	37	5	55	98	2
D	70	1	23	94	6
EL	55	3	39	97	3
E	50	7	36	93	7
F	61	4	33	98	2
IRL	51	6	33	89	11
I	30	5	62	97	3
L	45	1	53	100	0
NL	58	3	36	97	3
A	48	8	39	95	5
P	32	12	37	81	19
FIN	20	18	58	96	4
S	25	2	72	99	1
UK	55	2	41	98	2
EU15	53	4	39	96	4

Source: Gallup, 2000<sup>73</sup>

Availability of advanced telecommunications networks and services such as the Integrated Services Digital Network (ISDN<sup>74</sup>), Digital Subscriber Line (DSL<sup>75</sup>), Cable TV<sup>76</sup> and the Internet are of particular interest for our purposes because currently they represent the most important options for telecommunications access and applications beyond basic or mobile telephone connections. In particular cable TV has increasingly been discussed as an alternative mode of access to the online world during recent years, and many analysts expect interactive services increasingly being offered over this technical platform<sup>77</sup>. Here, the USA is leading when compared with the European Union and Japan. Overall 67% of all US households are connected to a cable TV network while only 40% of all EU households are. With only 17% cable penetration Japan considerably lacks behind in this regard.

As in the case of mobile telephony, cable penetration is quite unevenly spread across the EU (Table 7). In some Member States such as the Netherlands, Belgium and Luxembourg there exists a serious alternative to accessing telecom networks via cable. Of course, this is only possible if the (local, regional, national) CATV network has been technically prepared for this

<sup>73</sup> Ibid. : Residential Tables, p.1.

<sup>74</sup> ISDN (Integrated Services Digital Network) is a set of CCITT/ITU standards for digital transmission over ordinary telephone copper wire as well as over other media. Home and business users who install an ISDN adapter (in place of a modem) can see highly-graphic Web pages arriving very quickly (up to 128 Kbps). ISDN requires adapters at both ends of the transmission so your access provider also needs an ISDN adapter.

<sup>75</sup> DSL (Digital Subscriber Line) is a technology for bringing high-bandwidth information to homes and small businesses over ordinary copper telephone lines. xDSL refers to different variations of DSL, such as ADSL, HDSL, and RADSL. A user may be able to receive data at rates up to 6.1 megabits (millions of bits) per second (of a theoretical 8.448 megabits per second), enabling continuous transmission of motion video, audio, and even 3-D effects. More typically, individual connections will provide from 1.544 Mbps to 512 Kbps downstream and about 128 Kbps upstream. A DSL line can carry both data and voice signals and the data part of the line is continuously connected.

<sup>76</sup> Cable TV is also known as "CATV" (community antenna television) and delivers broadcast content to the end user via a cable network instead of a terrestrial antenna installed at the end users premises.

<sup>77</sup> See for instance: Tracy Swedlow: Interactive Enhanced Television - A Historical and Critical Perspective, 2000. (available at <http://www.itvt.com/etvwhitepaper.html>, 10.05.2002). See also:

new service. An interesting market in this respect is the Netherlands with a 95% penetration of cable television. This network is being further developed into a comprehensive broadband infrastructure. Some cable companies (like UPC) have recently started to deliver high-speed Internet services.

**Table 7 Percentage of households connected to cable TV, EU, 1999**

B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK
91	42	56	6	4	12	43	40	75	92	40	15	23	49	15

Source: Gallup, 2000<sup>78</sup>

ISDN is another network technology which offers capabilities which go beyond those offered by the Plain Old Telephone Service (POTS<sup>79</sup>). It enables digital transmission over ordinary telephone copper wire as well as over other media and allows a single wire or optical fibre to carry voice, digital network services and video. Data on ISDN access for the European Union is presented below in Table 8, which shows that the access of the general population to advanced networks is still very limited, Denmark and Luxembourg are leading with 10%, followed by Austria with (8%), Germany (7%), the Netherlands (6%) and Finland (5%). However, regarding utilisation of ISDN the European Union by far outstrips (Table 5) Japan and the USA. With some 66 million installed ISDN channels (64 kbits/s) Europe leads the ranking followed by Japan (32 million channels) and the USA (23 million channels).

**Table 8 Percentage of households connected to ISDN, EU, 1999**

B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK	EU15
5	10	7	1	1	3	2	1	10	6	8	1	5	4	3	4

Source: Gallup, 2000<sup>80</sup>

Although DSL receives increasing attention as an alternative to ISDN, penetration is still in its infancy (Table 5). Not surpassing a penetration level of 1% in all countries to be investigated it is far away from representing a widely utilised option for accessing the online world.

A further measure of a country's readiness for advanced IST services to be offered to its population is the level of utilisation of access devices, and – up to now - the desktop computer has represented the most important type of access terminal in this regard. Here, the European Union is somewhat behind the USA and Japan (Table 5). While some 50% of the households in the USA and Japan respectively possess a PC, only 38% of the EU households do so. However, PC penetration among private households varies considerably across the European Union (Table 9): from 65% in Sweden to only 11% in Greece and there is

<sup>78</sup> The European Commission: The situation of telecommunications services in the regions of the European Union - Residential report, realised by Gallup Europe, April 2000, Residential Tables p.13.

<sup>79</sup> POTS is a term sometimes used in discussion of new telephone technologies in which the question of whether and how existing voice transmission for ordinary phone communication can be accommodated. For example, Asymmetric Digital Subscriber Line and Integrated Services Digital Network connections provide some part of their channels for "plain old telephone service" while providing most of their bandwidth for digital data transmission.

<sup>80</sup> The European Commission: The situation of telecommunications services in the regions of the European Union - Residential report, realised by Gallup Europe, April 2000, Residential Tables, p.16.

some evidence that the EU may catch up in this regard over the coming years. For instance, data from the ECaTT survey indicate that about another 15% of all households planned to invest in a PC during the next two years (2000 and 2001)<sup>81</sup>, and the SeniorWatch data on older people confirm that this trend is continuing.

**Table 9 General population equipped with a PC or similar in %, EU, 1999**

B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK
44	60	33	11	29	32	18	29	45	54	31	20	41	65	33

Source: Gallup, 2000<sup>82</sup>

In relation to Internet utilisation among the general population (Table 5), the USA is leading the ranking with 61 users per 100 inhabitants. Japan and the EU follow with 31 users and 30 users per 100 inhabitants respectively. Here again it has to be noted that considerable variation can however be observed across the European Member States (Table 10). For instance, household penetration ranges from 51% in Sweden to 3% in Greece. This may illustrate that at least some Member States are able to compete with the USA as regards Internet utilisation among their citizens and businesses. As regards the latter, the data available suggest that all three regions investigated appear to approach the saturation level during the coming years anyhow (Table 5).

**Table 10 Household access to the Internet in %, EU, 1999**

B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK
12	35	11	3	6	8	6	7	17	21	12	4	21	51	17

Source: Gallup, 2000<sup>83</sup>

Besides potential accessibility, costs for telecommunications access and services are another important determinant of citizens indeed making use of modern telecommunications services. Therefore, an overview over pricing disparities between the European Union, the USA and Japan is provided in Table 11 for the usage of PSTN, mobile telephony and the Internet. It should however be noted in this context that generating a valid cost overview for Internet usage and other telecommunications services is a complex task because in the meanwhile a variety of service packages is available which are tailored to particular usage profiles. A direct price comparison of such packages is very difficult as the services included with each package can vary a lot. The figures provided here, therefore, represent trend information regarding comparative price levels in the regions investigated rather than information on definite prices for individual services.

Despite the fact that in most European Member States PSTN charges considerably declined during recent years, European users still tend to be charged higher rates than their counterparts in the USA and Japan – at least at peak times. In Finland which has the cheapest peak

<sup>81</sup> See ECaTT website: [www.ecatt.com](http://www.ecatt.com) "Benchmarking Electronic Commerce and Telemark Trends in Europe"

<sup>82</sup> The European Commission: The situation of telecommunications services in the regions of the European Union - Residential report, realised by Gallup Europe, April 2000, Residential Tables p.1.

<sup>83</sup> The European Commission: The situation of telecommunications services in the regions of the European Union - Residential report, realised by Gallup Europe, April 2000, Residential Tables, p. 1.

rate among all EU Member States users have to pay about 30% more than those in the USA and about 16% more than Japanese users for peak-time usage. PSTN users in Sweden where the off-peak rate is cheapest within the EU have to pay about 12% more than users in the USA but 31% less than their counterparts in Japan for off-peak time usage.

When it comes to costs for mobile communications, European users have to pay slightly more than users in the USA, but considerably less than Japanese users. On average, rates for mobile communications in the EU are about 7% higher than those in the USA, but 26% lower compared with Japan. The same ranking can be observed with regard to Internet charges. Here, the average European rate is 50% higher compared with the USA but about 10% lower compared with Japan.

**Table 11 Comparison of pricing levels for IST usage in the EU, in the USA and in Japan (in USD PPP<sup>84</sup>)**

	EU	USA	Japan
<b>Monthly basket of local telephone (PSTN) residential charges (USD PPP) in households (2000)<sup>85</sup></b>	42 (peak) 32 (off-peak)	21 (peak) 21 (off-peak)	31 (peak) 35 (off-peak)
<b>Basket of consumer mobile telephone charges (USD PPP, basket includes 50 minutes per month and excludes int. Calls, 2000)<sup>86</sup></b>	315	293	426
<b>Internet access basket for 20 hours at off-peak times using discounted PSTN rates (USD PPP, 2000)<sup>87</sup></b>	32,0	21,4	35,5

Source: various

### 3.2 IST utilisation among older Europeans

There has been a considerable debate during the recent years as to whether the TV and the Internet may converge into one type of system, and some analysts believe that consumer devices will increasingly be linked together with a TV set-top box likely to become a multimedia hub. In particular, some authors have argued that Internet access via the ordinary TV set may be of particular interest for people that cannot afford or do not want to buy a home PC<sup>88</sup>. According to representative SeniorWatch data<sup>89</sup> the TV set is at present the most widespread means of receiving electronic media content in older European's households with a penetration rate of 98% (Table 12), and there are currently some 20 million older Europeans (16% of

<sup>84</sup> Purchasing Power Parities (PPP) are the rates of currency conversion that eliminate the differences in price levels between countries. Per capita volume indices based on PPP converted data reflect only differences in the volume of goods and services produced. Comparative price levels are defined as the ratios of PPPs to exchange rates. They provide measures of the differences in price levels between countries. The PPPs are given in national currency units per US dollar.

<sup>85</sup> Source: Information Society Statistics - Pocketbook 2001

<sup>86</sup> Source: Communication Outlook 2001

<sup>87</sup> Source: Communication Outlook 2001

<sup>88</sup> See Bates, Peter J.: Exploiting new opportunities and overcoming barriers for learning in the digital home, <http://www.pjb.co.uk/upgrade2000.htm>, 13th March 2002.

Note that "penetration" refers to the individual level, reading 98% of all older Europeans live in households with at least one TV set.

<sup>89</sup> For details see: Older People and Information Society Technologies – A Comparative Analysis of the Current Situation in The European Union and Future Trends. European SeniorWatch Observatory and Inventory, project no. IST-1999-29086, deliverable no. 5.1, April 2002.

the EU 50+ population) who would be interested in accessing the Internet via their TV set<sup>90</sup>. About two third of these do currently not possess an Internet connection at home. Moreover, some 55 million older Europeans (45% of the EU 50+ population) use teletext and can thus be regarded as being familiar with retrieving structured information by means of electronic media - at least in a rudimentary form. However, despite recent developments in the field of interactive television, the traditional desktop computer can still be seen as the most important means of accessing the online world.

**Table 12: IST access and usage among the EU 50+ population by age in % (column)**

	Age				Total
	50 - 59	60 - 69	70 - 79	80+	
<b>TV set</b>	98.3	98.4	98.8	96.6	98.3
<b>Use of teletext</b>	58.0	47.8	31.5	22.4	45.3
<b>Cable-TV</b>	32.9	30.8	27.0	24.8	30.1
<b>Digital TV</b>	18.7	12.1	6.8	4.5	12.5
<b>DVD player for TV</b>	10.8	6.9	5.0	4.5	7.6
<b>Fax machine</b>	17.7	12.9	7.6	4.4	12.6
<b>Answering machine</b>	42.1	33.7	23.7	15.9	32.8

Base: All respondents

Source: © SeniorWatch, 2002

When it comes to computer usage among older Europeans, a considerable proportion of the European 50+ population has already gained hands-on experience with a PC (Table 13). Overall, 40% of the European 50+ population, i.e. some 49 million people, have ever used a computer once in their life (including 22% of those who are in their seventies and 12% of the 80+). Roughly one third (36%) currently have access to a computer at home<sup>91</sup>. Moreover, 8% or some 10 million older Europeans say that they are likely to purchase a computer during the next one or two years, and this figure does not include those who already have such a device and who plan a renewal of their equipment. Many of these will have particular user requirements due to their restricted ability to hear, to see or to manipulate computer equipment with their hands. By 2003, an increasing share of the EU 50+ computer users will suffer from restricted ability to see (35 %, i.e. some 42 million), to hear (37%, i.e. some 45 million) or to use their fingers (24%, i.e. about 30 million), e.g. for manipulation a key (Figure 1). Dexterity disabilities need particular attention as they appear to impede computer access of older people most severely.

<sup>90</sup> See Bates, Peter J.: Exploiting new opportunities and overcoming barriers for learning in the digital home, <http://www.pjb.co.uk/upgrade2000.htm>, 13th March 2002.

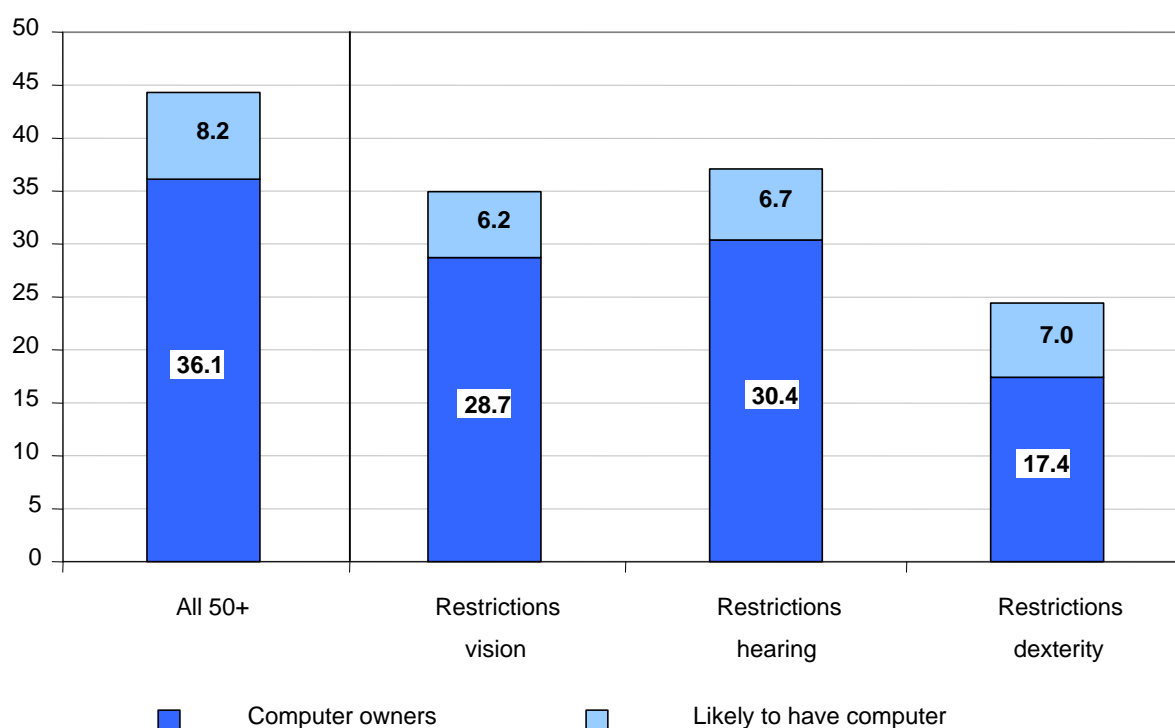
<sup>91</sup> This is a laptop computer for a small minority (5.1% or about 15% of all computer owners).

**Table 13 Computer access and usage among the EU 50+ population by age (row %)**

Age	PC at home already	Likely to have a PC at home within next two years	Ever used PC / other computer?	Regular computer user	Use of computer at workplace
50 – 59	56.8	10.8	59.1	46.3	43.4
60 - 69	31.6	9.3	38.7	22.0	23.8
70 - 79	19.0	5.0	22.0	11.0	10.5
80+	16.0	2.8	12.1	6.2	2.6
Total	36.1	8.2	39.6	26.6	25.7

Base: all respondents

Source: © SeniorWatch, 2002

**Figure 1 Current computer ownership and purchasing plans within the next one or two years among older Europeans with severe functional restrictions (in %), 2001**

Base: all respondents (N=9661)

Source: © SeniorWatch

The Internet has only begun to enter the European senior market. The SeniorWatch survey revealed that 22% of the European 50+ population (27 million) currently live in a household with Internet access (Table 14); these are 61% of those who own a computer. Overall, 17% use the Internet regularly (at least once a month). However, Internet usage is more widespread among the younger age cohorts compared with the older ones. While 30% of those who are in their fifties use the Internet regularly, only 5% of those who are 80 years and older do so. Overall, the market of regular Internet users among the EU 50+ population is heading

for 60% growth within the next two years, and some 32 million older Europeans (50+) will be on the Web by the end of 2003 (Figure 2). Of these, some five million will suffer from a severe functional restriction, particularly vision and dexterity disabilities, and these will need attention by design-for-all developments and Internet services (Figure 5).

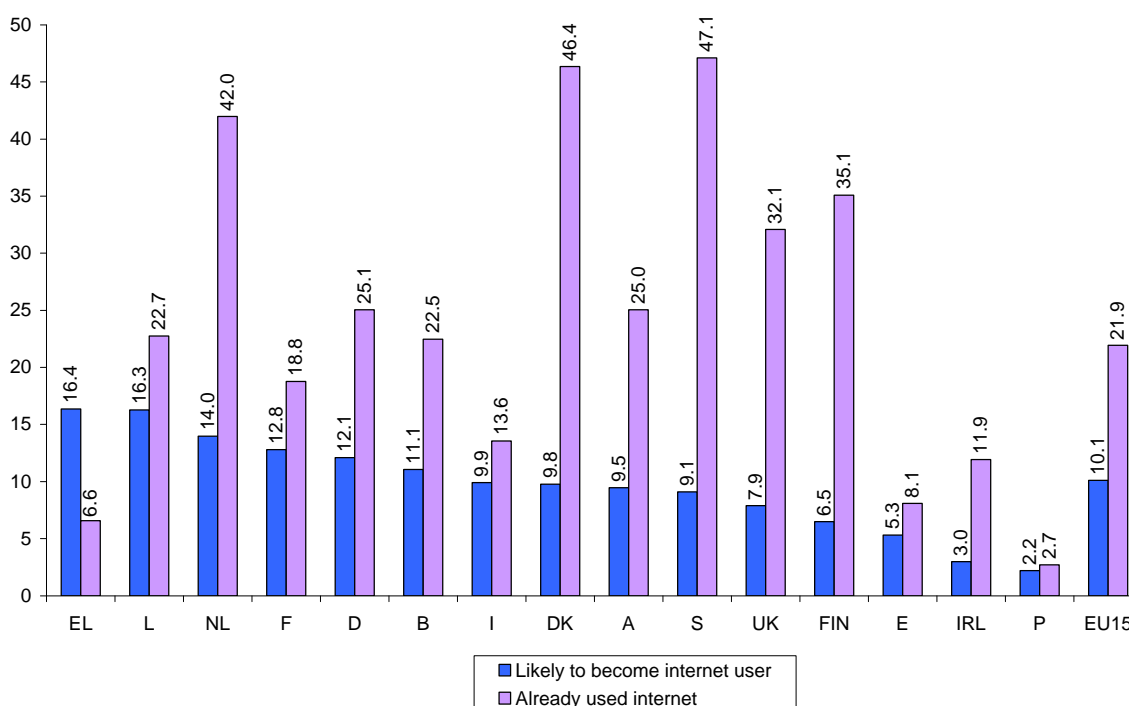
**Table 14 Internet access and usage among the EU 50+ population by age, 2001 (in %)**

	Internet-access at home	Ever used the Internet	Regular Internet user
<b>50 – 59</b>	37.9	38.3	30.0
<b>60 – 69</b>	19.1	18.3	12.8
<b>70 – 79</b>	9.8	8.1	5.6
<b>80+</b>	7.0	6.7	5.2
<b>Total</b>	22.4	21.9	16.5

Base: all respondents.

Source: © SeniorWatch, 2002

**Figure 2 EU 50+ population likely to use Internet within the next two years by Member State (%)**



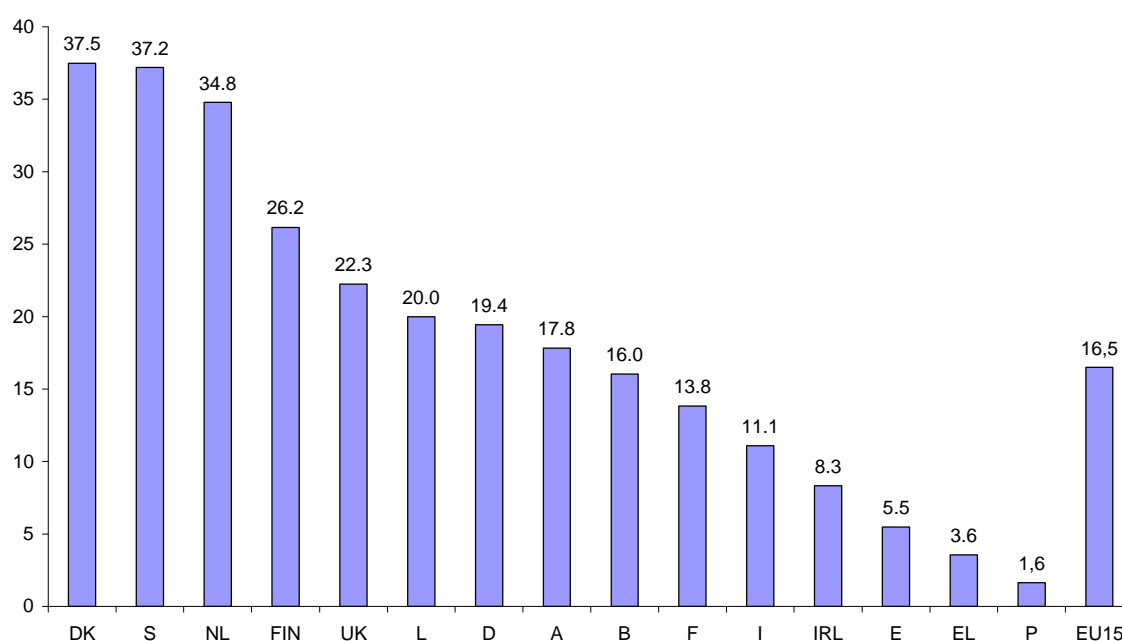
Base: all respondents

Source: © SeniorWatch, 2002, OPS (OPS00037)

Utilisation of the Internet among the 50+ population is unevenly spread across the European Union, and SeniorWatch data reveal a considerable north/south gradient in this regard. For instance, with respect to regular Internet usage among older Europeans Denmark, Sweden and the Netherlands lead the ranking with a share of about 35% (Figure 3). Finland leads the group with a share of 26% followed by the United Kingdom, Luxembourg, Germany, Austria and Belgium, each surpassing the EU-average of 16%. The remainder of the Member States considerably lacks behind.

The north/south gradient observed with regard to the utilisation of the Internet also relates to other IST applications and devices. For instance, the average number of IST applications and devices utilised in 50+ households ranges from 2.2 in Portugal to 6.5 in the Netherlands respectively. Older people in the Nordic countries and of the Netherlands utilise the largest variety of IST applications for their purposes, and Austria, Belgium, Germany, Luxembourg and the United Kingdom can be regarded as "follower countries" in this regard. Italy, France and Ireland show values somewhat below the EU-average while Spain, Greece and Portugal lack behind considerably.

**Figure 3 Regular Internet users among the EU 50+ population (%)**

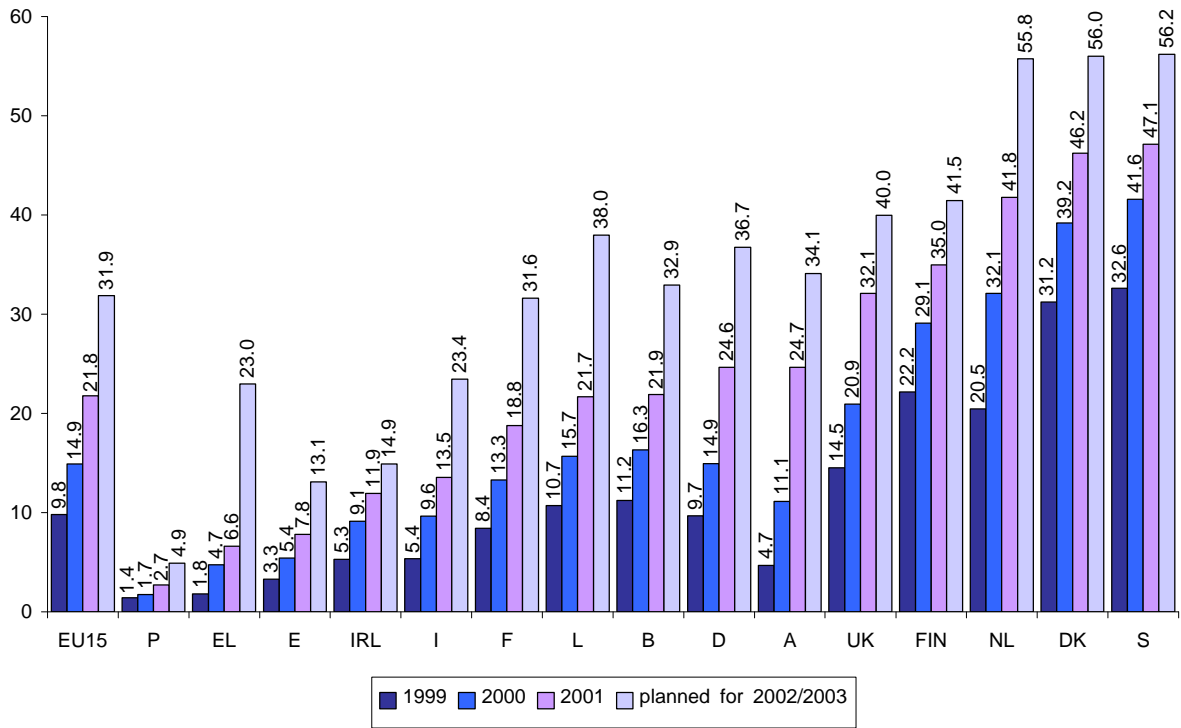


Base: all respondents

Source: © SeniorWatch, 2002, OPS (OPS00024a)

The dynamics of the European senior Internet market become evident when comparing the growth rates of first-time Internet users over the recent years. According to the SeniorWatch survey, hands-on experience with the Internet among the European 50+ population has steadily increased since 1999 (Figure 4). However, the average yearly growth rate of those who at least tried out the Internet - even if they ultimately not necessarily became regular users - declined from 52 percent to 46 percent between 1999 and 2001, and for the next two years a growth rate of only 21% is expected. Denmark and Sweden can be regarded as the "forerunners" in this regard, as their relative growth with respect to first-time use was above 30% in 1999 already. The Netherlands and Finland caught up quite soon whereas the United Kingdom followed somewhat later. Austria has managed to perform the greatest leap forward in recent time as the number of older Internet users has more than doubled each year. Italy and Greece will show considerable growth rates over the coming years whereas Ireland, Spain and in particular Portugal are at risk of falling behind considerably.

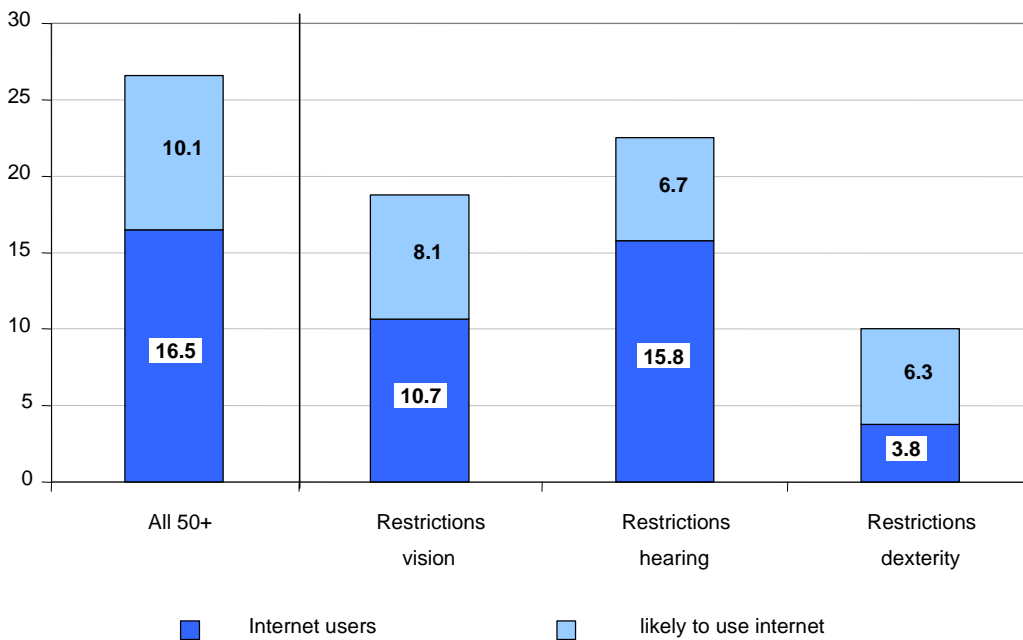
**Figure 4 First-time use of Internet among the EU 50+ population by EU Member State (Cumulative %)**



Base: all respondents.

Source: © SeniorWatch, 2002, OPS (OPS00020)

**Figure 5 Current Internet usage plans to use it within the next one or two years among older Europeans with severe functional restrictions (in %)**



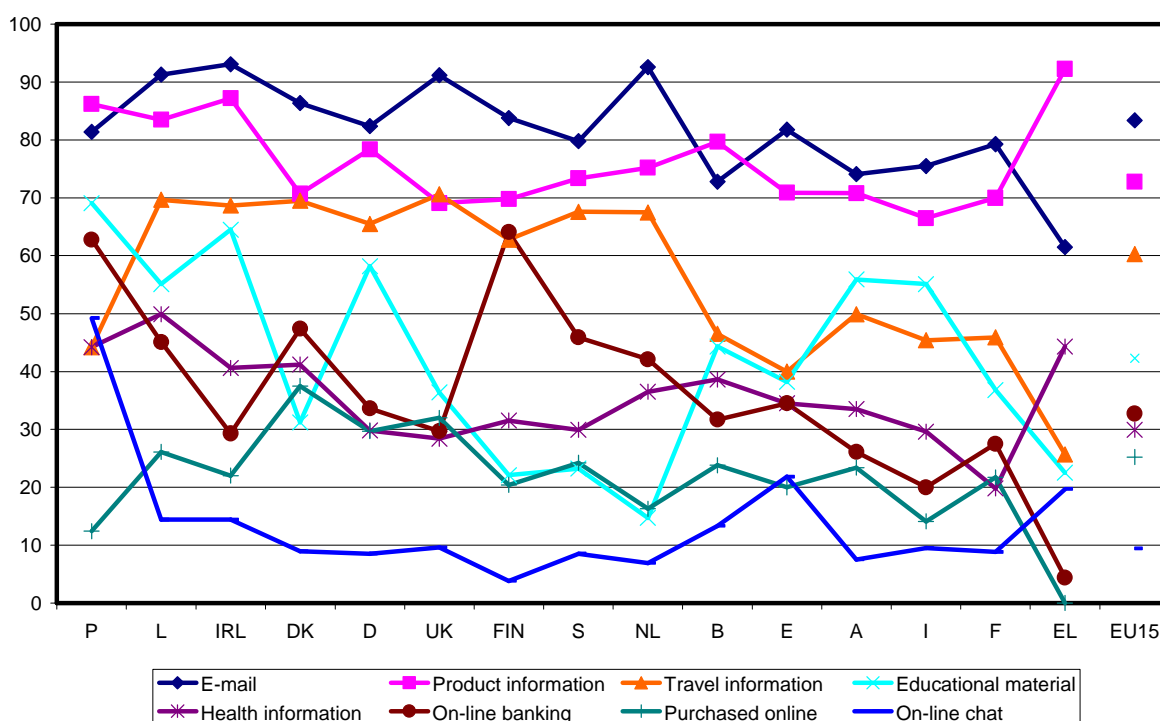
Base: all respondents (N=9661)

Source: © SeniorWatch

Despite the fact that utilisation of the Internet among the 50+ population is quite unevenly spread across Europe, a considerable proportion of older Europeans uses this technology already. Figure 6 shows for what purposes the Internet is going to be utilised in the individual EU Member States<sup>92</sup>. The Internet activities which are most popular among older users in all Member States include e-mail and information search. As regards the latter, product information appear to receive the highest interest followed by travel information and educational material (which shows considerable variation across the EU) whereas information on health issues are going to be retrieved to lower extent. As regards the latter in particular, a more detailed analysis of the survey results indicates that there is considerable interest for such applications within both groups - Internet users and non-users. But the potential of the Internet as a health information source has to be communicated to the target group as a key benefit of being online. The large market potential for Internet-based health information services is obviously not yet appropriately exploited.

Transaction services such as online-banking and online-purchasing clearly rank behind information retrieval, and chatting - a means of social communication - receives even less attention within the 50+ population. When it comes to national peculiarities regarding Internet activities of older Europeans online banking appears to be quite popular in Finland and Portugal<sup>93</sup>, and also with regard to online purchasing and chatting considerable national peculiarities can be observed. As regards the latter, with a share of nearly 50 percent the Portuguese users by far outstrip all other nationalities.

Figure 6 Older European's (50+) activities on the Internet by Member State (%)



Base: Frequent Internet users

Source: © SeniorWatch, 2002, OPS (OPS00018a)

<sup>92</sup> Note that the figures reported in the table refer to regular Internet users, and that the absolute no. of respondents belonging to this group within the sample may be below < 100 in some countries: Portugal (8), Luxembourg (20), Greece (24), Ireland (43), Spain (55), Belgium (70) and Austria (93)..

<sup>93</sup> Note: the overall number of older Internet users in Portugal is relatively low compared with Finland.

Compared with the Internet, the EU 50+ mobile phone market has more quickly become mature. Therefore, only 20% growth is expected on a relatively high penetration level within the next two years (Table 15). The number of older mobile phone users will rise to some 71 million, of which some 14 million will be considerably restricted as regards their ability to see, to hear or to use their fingers.

**Table 15 Mobile telephony access and usage among the EU 50 + population (row %)**

Age	Possessing a mobile phone	Used mobile phone last month	Ever sent/received SMS	Likely to purchase mobile phone within two years
50 - 59	63.7	57.3	32.6	9.9
60 - 69	49.4	42.8	15.6	11.6
70 - 79	34.7	27.8	7.2	9.1
80+	16.8	11.4	3.0	7.0
Total	48.2	41.7	18.5	10.0

Base: all respondents

Source: © SeniorWatch, 2002

With regard to recent discussions of the digital divide, our data reveal that from an ICT perspective, older people cannot and must not be looked upon as a homogeneous group. The majority of older Europeans are in principle open-minded towards new technology and many have already gained hands-on experience with a computer (Table 16). At the same time, about one third of the European older population are at risk of exclusion from the Information Society, and this does not only concern older age cohorts.

**Table 16 Generic IST involvement typology of the EU 50+ population**

Generic type	Description	Share in the EU 50+ population (in %)
<i>"The experienced frontrunners"</i>	Computer users with professional or advanced user skills and/or using computers at least once a week	26.7
<i>"The old age beginners"</i>	Computer users with less than advanced computer user skills using computers less often than once a week	13.0
<i>"The technologically open minded"</i>	Non-users but keen on learning about technology and/or wishing to improve their computer skills	29.1
<i>"The digitally challenged"</i>	Non-users who are not interested in learning about technology and/or wishing to improve computer skills	31.3

Base: All respondents.

Source: © SeniorWatch, 2002

With respect to the propensity of older Europeans to become familiar with computer technology, the commonly identified dimensions of the digital divide dominate, i.e. the well known dimensions of socio-economic stratification: gender, education, occupational background (and derived thereof the socio-economic status). In other words, whether or not older Europeans wish to develop their computer skills cannot simply be regarded as a matter of age, but is largely associated with several dimensions of social stratification. In general, those

who are interested in improving their computer skills tend to be younger and better educated; they tend to have a rather active life style and are on average better off in economic terms. Moreover, the share of male persons is higher than in the average population. Also, people suffering from any functional restriction regarding their ability to see, to hear or to use their fingers are less likely to be keen on developing computer skills (see Table 17).

**Table 17 Older Europeans (50+) keen on improving computer skills by demographics (%)**

Demographic variable	Group	% Wishing to improve computer skills
	<b>Total</b>	<b>31.5</b>
Computer usage	Regular computer users	58.1
	Non- (and non-regular-) computer users	21.7
Age	Age 50-59	45.1
	Age 60-69	31.3
	Age 70-79	17.9
	Age 80+	14.6
Education	Age at end of full time education 13-	15.9
	Age at end of full time education 14	19.4
	Age at end of full time education 15-16	29.1
	Age at end of full time education 17-20	40.7
	Age at end of full time education 21+	49.0
Gender	Women	28.3
	Men	35.5
Social Grade	Unskilled manual workers and other less well educated worker	21.5
	Skilled workers and non-manual employees	39.1
	Well educated non-manual and skilled workers	42.0
	Managers and professionals	47.9
Activity index	--	10.8
	-	27.6
	+	38.5
	++	50.2
Income	--	19.5
	-	27.8
	+	38.4
	++	47.8
Impairment	not at all	33.7
	at least one light impairment	33.4
	at least one serious impairment	23.9
	serious impairment: vision	23.7
	serious impairment: hearing	28.0
	serious impairment: dexterity	16.4

Base: all respondents, DK refusal excluded.

Source: © SeniorWatch, 2002, OPS (OPS00151)

### 3.3 IST utilisation among older US Americans

Traditionally, the USA have been the leading nation in developing the Internet towards a widely used mass medium since the mid 80ies. As stated in a recent report from the U.S. Department of Commerce, few technologies have spread as quickly, or become so widely used, as computers and the Internet<sup>94</sup>. These information technologies are rapidly becoming common fixtures of modern social and economic life, opening opportunities and new avenues for many American citizens. In the last few years, Americans' use of the Internet and computers has grown substantially. The rate of growth of Internet use in the United States is currently two million new Internet users per month. More than half of the nation is now online. In September 2001, 143 million Americans (about 54 percent of the population) were using the Internet - an increase of 26 million in thirteen months. The recent year saw a rapid increase in computer and Internet use, not only in homes, but also at the workplace, schools, and other locations.

Nevertheless, according to the same report there is still a sizeable segment of the U.S. population that has not made any use of the Internet, and the majority of the 50+ population – independent of gender - belongs to this group (Table 18). Despite the fact that the share of non-users among those aged 50 years and older has considerably declined during recent years - from nearly 90 percent in 1997 to about 60 percent in 2001 - people 55 and older are least likely to utilise the Internet for their purposes ,e.g. , for playing games, for job searching, for participating in chat rooms or list servers, for viewing television or movies, for listening to the radio, or for trading online (Figure 7). On the other hand, this age group is more likely (42.7 percent) than any other age group to check health information online and show equally strong e-mail use. In this context, it has to be noted that the recent media hype concerning US seniors being the fastest growing segment of online users is certainly true, but that a primary reason for this age group's relatively strong growth rates must be seen in its slowness in getting wired initially: relative growth tends to be higher when starting from a smaller base.

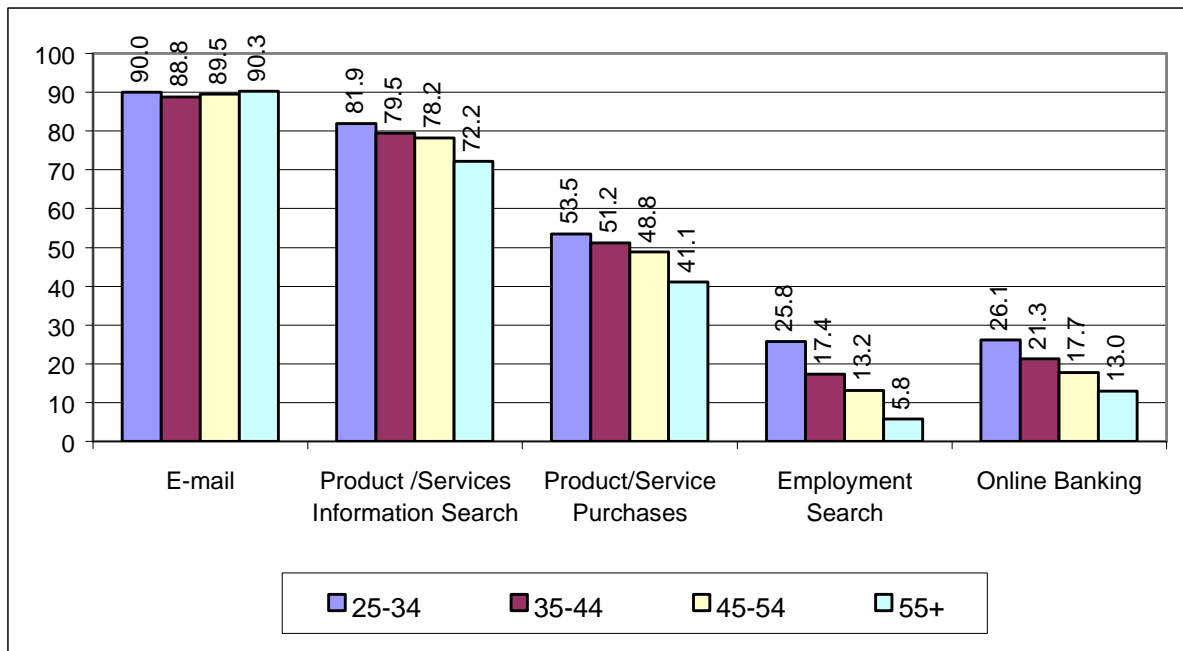
In particular, the report illuminates significant discrepancy in Internet use between users aged 50 years and above versus users over 60 years. Those over 60 are less likely than other age groups to have a computer in their home or to use the PC or the Internet in the home, and for those with a disability the use rates are even lower (Table 19). In addition, people in this age group are much less likely to use the Internet outside of the home. These findings are supported by further research<sup>95</sup> suggesting that an American between 50 and 64 years old is three times more likely to have Internet access than someone over the age of 65 (51% vs. 15%). In contrast to wired seniors (i.e. those who are aged 65 and older), "pre-retirement" Internet users (i.e. those aged 50-64) match the overall Internet population in their use of the Internet for email, getting general and political news, checking weather, and doing research for their jobs. Overall, 68% of wired seniors say they would miss the Internet if they could no longer use it and 75% of Internet users between 50 and 64 years old feel that way. While today's senior citizens are the least likely to go online, the cohort behind them is among the most wired. Internet users aged 50-64 are likely to keep their Internet access even after they retire and these "silver surfers" may be the generation that takes advantage of all the Internet has to offer them as they get older.

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<sup>94</sup> U.S. Department of Commerce, Economics and Statistics: A Nation Online: How Americans Are Expanding Their Use of the Internet, 2002. Available at: <http://www.ntia.doc.gov/ntiahome/dn/>. The report is based on findings from the September 2001 U.S. Census Bureau's Current Population Survey – a survey of approximately 57,000 households and more than 137,000 individuals across the United States.

<sup>95</sup> See *ibid*.

**Figure 7 Selected online activity by age as a percent of Internet users in the USA, persons age 25+, 2001**



Source: NTIA and ESA, U.S. Department of Commerce, using U.S. Census Bureau Current Population Survey Supplements

**Table 18 Non-Internet use from any location by individuals age 3 and older in the USA , October 1997, December 1998, August 2000, and September 2001**

	Oct. 1997 (thousands)		Dec. 1998 (thousands)		Aug. 2000 (thousands)		Sept. 2001 (thousands)		Non-Internet Use (percent of population)			
	Non-Internet Users	Total	Non-Internet Users	Total	Non-Internet Users	Total	Non-Internet Users	Total	Oct. 1997	Dec. 1998	Aug. 2000	Sept. 2001
<b>Total Population</b>	198,914	255,689	173,866	258,453	146,140	262,620	122,357	265,180	<b>77.8</b>	<b>67.3</b>	<b>55.6</b>	<b>46.1</b>
Male	35,498	50,177	29,165	50,054	22,956	50,034	19,128	50,020	70.7	58.3	45.9	38.2
Female	38,716	51,676	30,975	51,781	22,557	51,913	17,624	51,871	74.9	59.8	43.5	34.0
<b>Age 50 +</b>	61,237	68,949	57,183	70,852	51,822	73,580	47,377	75,272	<b>88.8</b>	<b>80.7</b>	<b>70.4</b>	<b>62.9</b>
Male	26,692	31,252	24,892	32,248	22,572	33,561	20,681	34,438	85.4	77.2	67.3	60.1
Female	34,545	37,697	32,291	38,604	29,250	40,019	26,696	40,834	91.6	83.6	73.1	65.4

Source: U.S. Bureau of the Census, Current Population Survey supplements, October 1997, December 1998, August 2000, September 2001

**Table 19 Computer and Internet use at home among those over 60 in the USA by disability status, 2001 (in%)**

	Size of Population in Category (in Thousands)	Percent of Population (percent)	Has a Computer at Home (percent)	Of Those Who Have a Computer at Home		Uses the Internet from Any Location
				Uses a the Computer at Home (percent)	Uses the Internet at Home (percent)	
<b>Multiple Disabilities</b>	4,927.2	13.5	22.2	31.4	23.8	6.2
<b>Blind or Severe Vision Impairment</b>	446.7	1.2	30.2	42.6	27.5	9.6
<b>Deaf or Severe Hearing Impairment</b>	771.6	2.1	35.4	56.5	45.7	17.8
<b>Difficulty Walking</b>	2,592.9	7.1	28.7	62.9	49.3	16.1
<b>Difficulty Typing</b>	327.9	0.9	24.9	62.3	52.3	13.5
<b>Difficulty Leaving Home</b>	712.2	2.0	25.7	33.2	25.2	7.2
<b>None of These Disabilities</b>	26,767.1	73.2	39.4	67.0	56.7	25.4
<b>Total</b>	36,545.6		35.8	62.8	52.5	21.3
<b>Not answering</b>	11.4					

Source: NTIA and ESA, U.S. Department of Commerce, using U.S. Census Bureau Current Population Survey Supplements

When it comes to factors constraining uptake of the Internet among older Americans, lack of interest and/or perceived benefits rather than cost considerations and lack of knowledge about this technology appear to represent major hindrances for getting online. In a survey conducted during 2001<sup>96</sup> households without Internet subscriptions were asked the question: "What is the main reason that you don't have the Internet at home?" Among those aged 55 years and above - about 70% - the largest specific response was simply "don't want it" and the second one was - about 13% - that the cost was "too expensive" (Table 20). Other reasons such as lack of home access to a computer, lack of knowledge and lack of computer capabilities appear to play an even less important role for not getting online.

Apart from this, recent research<sup>97</sup> suggests that individual socio-economic circumstances play a crucial role as to whether older Americans utilise the Internet for their purposes. For instance, wealthy and educated seniors are most likely to go online. Many seniors have been coaxed online by their children and grandchildren and have become enthusiastic Internet users who love email and use the Web to gather all kinds of information that helps or entertains them. Overall, they are more likely than their offline peers to be married, highly edu-

<sup>96</sup> See *ibid.*

<sup>97</sup> For the following see: *RED SENIORS: A fervent few, inspired by family ties*, Pew Internet & American Life Project, September, 2001, available at: <http://www.pewInternet.org>

cated, and enjoying relatively high retirement incomes. One in four wired seniors lives in a household with an annual income of over \$75,000, compared to just 8% of all seniors (Table 21).

**Table 20 Main Reasons for No Internet Use at Home, by Selected Characteristics of Reference Person (Numbers in Thousands) Total USA, 2001 (in %)**

	Total no. of households	Don't want It	Too expensive	Can use elsewhere	Computer capability	No computer in household	Lack of knowledge	Concerned about children using It	Other
<b>All Households</b>	49,197	53.05	25.29	4.09	1.06	5.93	2.10	0.93	7.56
<b>45-54 years old</b>	7,815	48.00	28.96	5.30	1.16	5.93	1.71	1.13	7.80
<b>55+ years old</b>	23,246	69.44	13.56	1.81	0.62	4.21	2.98	0.14	7.23

Source: NTIA and ESA, U.S. Department of Commerce, using U.S. Census Bureau Current Population Survey Supplements

**Table 21 Demographics of Internet users aged 65 years and older in the USA**

		Senior Citizen Demographics	
		All Seniors	Wired Seniors
		%	%
<b>Gender</b>	Male	43	60
	Female	57	40
<b>Race/Ethnicity</b>	White	86	92
	African-American	8	3
	Hispanic	4	3
<b>Marital status</b>	Married (or living as)	47	74
	Divorced/separated	10	9
	Widowed	39	18
	Never been married	3	1
<b>Income</b>	Under \$30,000	63	24
	\$30,000-\$50,000	21	33
	\$50,000-\$75,000	8	19
	\$75,000+	8	25
<b>Education</b>	Less than high school	29	4
	High school graduate	34	21
	Some college	20	30
	College graduate or more	16	46

N=4, 335. Margin of error is +/- 2%

Source: Pew Internet & American Life Project Surveys, March-Dec 2000

The digital divide between those with access to new technology and those without is now one of America's economic and civil rights issues. The U.S. Bureau of the Census administers the Current Population Survey (CPS) to a representative sample of about 50,000 U.S. households each month<sup>98</sup>. Data from the CPS cover a variety of topics around employment as well as demographic information. Supplemental question modules are regularly added to provide information on specific topics such as computer use. The CPS supplements were used by US Department of Commerce Bureau of the Census when a series of studies was commissioned to identify computer and Internet use by Americans; trends in access and usage, U.S. telephones, computers, modems and the Internet. A series of four reports completed by the *National Telecommunications Information Administration (NTIA)*<sup>99</sup> examined the digital divide: They explored the characteristics of the "have nots" in rural versus urban settings and also gained new insights into the "information disadvantaged" in America's central cities, enabling policy makers to array these characteristics between urban and rural users. The reports show that there are strong disparities in computer and Internet access and use that correspond to the key demographic characteristics of age, income, and race/ethnicity. Despite the fact that the number of Americans who are utilising electronic tools in their daily lives is rapidly increasing, the digital divide appears to remain, particularly for seniors with disabilities<sup>100</sup>.

For instance, among those who are aged between 50 to 64 years, 30% have at least one out of five disabilities which were investigated<sup>101</sup>. Also, the proportion of those with any one of the five disabilities considered, with the exception of learning disabilities, is substantially higher than in the 25-49 year old group. This is an age group that has wide variations in Internet access and computer use within the group of people who have disabilities. For example, 70.9% of those who have a disability and have family income of less than \$25,000 have never used a PC. That proportion falls to 29.7% in the \$75,000 and above income group. Overall, 48% of those aged between 50 and 65 years who have no disability are regular PC users while only 23% of those with a disability are. When it comes to Internet access at home a similar gap becomes obvious. While 42% of the non-disabled possess an Internet connection only 24% of the disabled do.

With respect to those who are 65 years and older, the digital divide is even wider<sup>102</sup>. Over one-half (52%) of the population in this age group has a disability. This age group has very low rates of home Internet access and computer use generally, and the rates for those with a disability are very low. Therefore, even with the large number of those with a disability, low rates of home Internet access make it impossible to distinguish between individual types of disabilities. Overall, 9% of those who are aged 65 years and over and who have a disability had Internet access at home while 17% of seniors without a disability had Internet access. Only 5% of individuals with disabilities regularly use a PC in this age range while 15% of seniors without disabilities frequently use a PC.

According to the American Association of Retired People (AARP), the driving force for the implementation of ICT among the senior population in the USA has been the explosion of the senior population and the lobby groups representing them<sup>103</sup>. Older Americans compose a larger proportion of the United States' population than ever before. As the so-called "baby boom" generation continues to age, ICT has become a priority among its members. This population - as a majority - has had and will continue to have tremendous impact on ICT

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<sup>98</sup> <http://www.census.gov/population/www/socdemo/computer.html>

<sup>99</sup> [www.ntia.doc.gov](http://www.ntia.doc.gov)

<sup>100</sup> U.S. Department of Commerce & Economic and Statistics Administration & National Telecommunications and Information Administration: *Falling Through the Net: Toward Digital Inclusion - A Report on Americans' Access to Technology Tools*, Washington DC, 2000.

<sup>101</sup> See *ibid.*, p. 81-82

<sup>102</sup> See *ibid.*, p. 83-84

<sup>103</sup> <http://research.aarp.org>

within the United States. This group of people has been influential in lobbying for key legislation such as the Americans with Disabilities Act (ADA) and the Telecommunications Act as well as influencing governmental decisions and the financial support of them. Age can be expected to become less determinative of computer ownership.

Against this background, the AARP commissioned a national survey on the preparedness of older Internet users for e-commerce<sup>104</sup>. According to this survey skills level and confidence in using the computer vary considerably in the 45+ population. Specifically, users aged 65 years and older, less affluent users, and less educated users are generally less proficient and less confident than those who are younger, more affluent and more educated. Moreover, a substantial portion of the of computer users appear unable or unwilling to spend money on maintaining or upgrading their systems. Thus, a significant proportion of computer users aged 45 and above is potentially at risk in an increasingly technology-driven environment.

According to the AARP report, confidentiality of personal financial information is of utmost concern to the population surveyed. Virtually all respondents believe that any personal information given to a business during a financial transaction remains the property of the consumer. They express resounding opposition to unrestricted sharing of personal financial information among businesses. Those computer users who rate themselves as "novices" - nearly four in ten of all computer users surveyed - are less favourable than more experienced computer users to giving businesses the option of requiring electronic signatures, and more concerned that they would have less protection with electronic contracts. They are also less likely than more experienced computer users to feel sufficiently informed to have an opinion on electronic contracts issues, including issues of responsibility and privacy, and they are less likely to have been approached by companies selling products that protect information privacy.

### 3.4 IST utilisation among older Japanese

The economic recession that has gripped Japan since 1990 has fostered a widespread sense that a radical change in government and business world is required to restore the country to acceptable level of economic growth, and a recurrent sense of falling behind the rest of the world has given rise to major government reforms. IT policy is at the centre of the reform process. For instance, Prime Minister Yoshiro Mori stated in July 2000: "I will personally demonstrate leadership in order to bring about a Japanese IT society in which everyone, from the children to the elderly can enjoy the benefits of IT"<sup>105</sup>. Japan's efforts to promote the Internet can be seen as an attempt to foster economic change at large rather than merely facilitating implementation of a particular technology.

According to a recent report<sup>106</sup> published by the Japanese Ministry of Public Management, Home Affairs, Posts and Telecommunications (MPHPT) Internet usage has been steadily increasing over the last years. Overall, 34 percent of Japanese households possessed an Internet connection by the end of 2000, and the number of users aged 15 to 79 years

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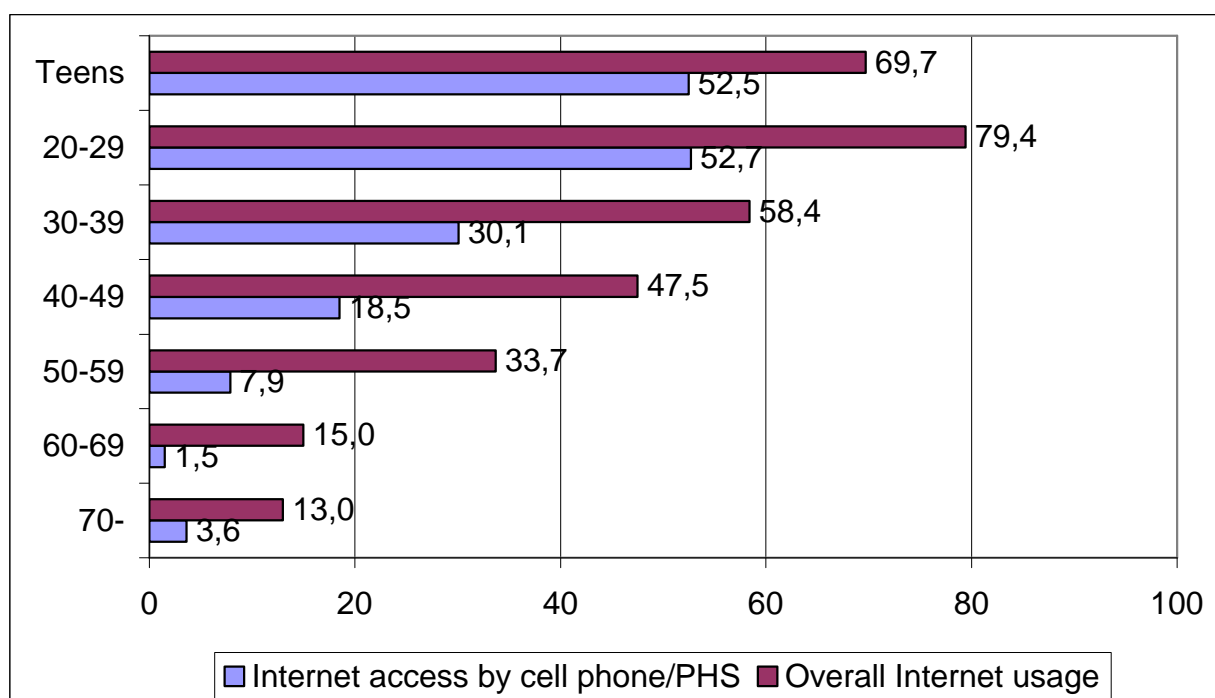
<sup>104</sup> For the following see: AARP National Survey on Consumer Preparedness and E-Commerce: A Survey of Computer Users Age 45 and Older, March 2000. Field work was conducted by Market Facts in February 2000. Overall, 1,002 computer users age 45 and older, including 375 members of AARP were interviewed. This includes those who have access to computers, whether at home (81% of those surveyed) or somewhere else (50%). These respondents were identified through random digit dialing to reach a nationally representative sample of computer users age 45 and older.

<sup>105</sup> Dewery Ballantine and Cyperworks Japan (2001), The Internet in Japan: Catalyst for Change ?. Executive summary p.1 (accessible at [http://www.dbtrade.com/ecommerce/the\\_internet\\_in\\_japan.htm](http://www.dbtrade.com/ecommerce/the_internet_in_japan.htm))

<sup>106</sup> White Paper 2001: Information and Communications in Japan, General Policy Division, Information and Communications Policy Bureau, Ministry of Public Management, Home Affairs, Posts and Telecommunications, Japan. p.5 (available at: [http://www.soumu.go.jp/joho\\_tsusin/eng/Resources/WhitePaper/WP2001/2001-index.html](http://www.soumu.go.jp/joho_tsusin/eng/Resources/WhitePaper/WP2001/2001-index.html)).

reached some 47 million. A distinct characteristic of the Japanese Internet market is that access happens not only via a PC but increasingly via cellular phones. The launch of NTT DoCoMo's mobile Internet access system "imode" has been driving a dynamic development of mobile Internet services since the late 1990s. The number of subscribers increased from below 5 million at the beginning of 2000 to more than 30 million at the beginning of 2002<sup>107</sup>. The exponential growth in mobile Internet usage reflects NTT DoCoMo's global leadership in this technology. In contrast, the explosive growth of PC-based Internet usage observed during the 1990s in the USA and in some European Member States reached Japan with some delay. Nevertheless, penetration among the younger population has now reached a considerable level (Figure 8), and the overall number of Internet users (fixed and/or mobile) is estimated to increase to some 87 million by the end of 2005<sup>108</sup>.

**Figure 8 Comparison of total Internet users, PC Internet users and cellular phone/PHS Internet users according to age in Japan, 2000 (in %)**



Source: <sup>109</sup>

When it comes to Internet usage among older citizens, many obstacles appear to prevent broader utilisation of these technologies<sup>110</sup>. Only some 15% of Japanese population aged between 60 and 69 years utilise, e.g., the Internet for their purposes (Figure 8) while nearly 80% of those who are in their twenties do so. Particularly with regard to Internet access via

<sup>107</sup> see: <http://www.eurotechnology.com/imode/faq-gen.html>, 17th of May 2002

<sup>108</sup> White Paper 2001: Information and Communications in Japan, General Policy Division, Information and Communications Policy Bureau, Ministry of Public Management, Home Affairs, Posts and Telecommunications, Japan, p.5 (available at: [http://www.soumu.go.jp/joho\\_tsusin/eng/Resources/WhitePaper/WP2001/2001-index.html](http://www.soumu.go.jp/joho_tsusin/eng/Resources/WhitePaper/WP2001/2001-index.html)).

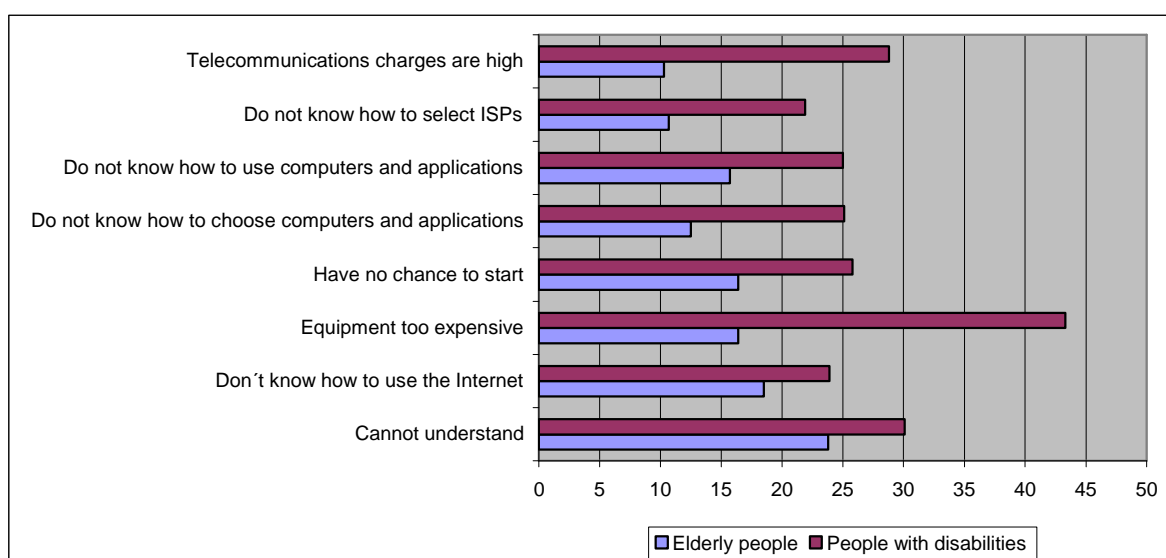
<sup>109</sup> Ministry of Public Management, Home Affairs, Posts and Telecommunications Japan: White Paper Communications in Japan 2001, p.30.

<sup>110</sup> For the following see: Chika Sekine: The Role of Universal Design: Closing the Gap of Digital Divide, Universal Design Institute for Information Technology. 2001 (available at [www.udit-jp.com](http://www.udit-jp.com))

cellular phones older people frequently cite problems with seeing the numbers and letters on the screen and with comprehending how to fully operate the device<sup>111</sup>. Apart from this, the lack of typewriting skills, the frequent use of English technical terms, and few opportunities to come in contact with PCs can be regarded as the main reason given by older Japanese to avoid Information Technology in general. Taking into account that the adult population has reached close to 50% of the overall population, there still remains a considerable number of Japanese who have not yet been involved in the dynamic development of the Japanese Internet market.

This also concerns people with disabilities. According to a survey conducted by the Promotion Committee of the Info-communications Support System for People with Disabilities<sup>112</sup> about 70% of the disabled and 80% of the elderly said that they do not use computers or the Internet. Asked about the reasons for not using these technologies both groups expressed their uneasiness and lack of information, choosing replies that indicated their insufficient knowledge of the Internet, unfamiliarity with computers, lack of people to teach them about these technologies and lack of opportunity to use such equipment. In particular, high costs for telecommunications services and equipment required deter disabled Japanese from going on-line (Figure 9). Asked about what would motivate them to start using computers and the Internet, many of those surveyed said they would like to see subsidies for the purchase of computers and for telecommunications charges, support centres and instructors that they can turn to in trouble, and facilities where they can learn how to use computers (Figure 10).

**Figure 9 Reasons for not using the Internet in Japan (multiple replies possible; in percent)**



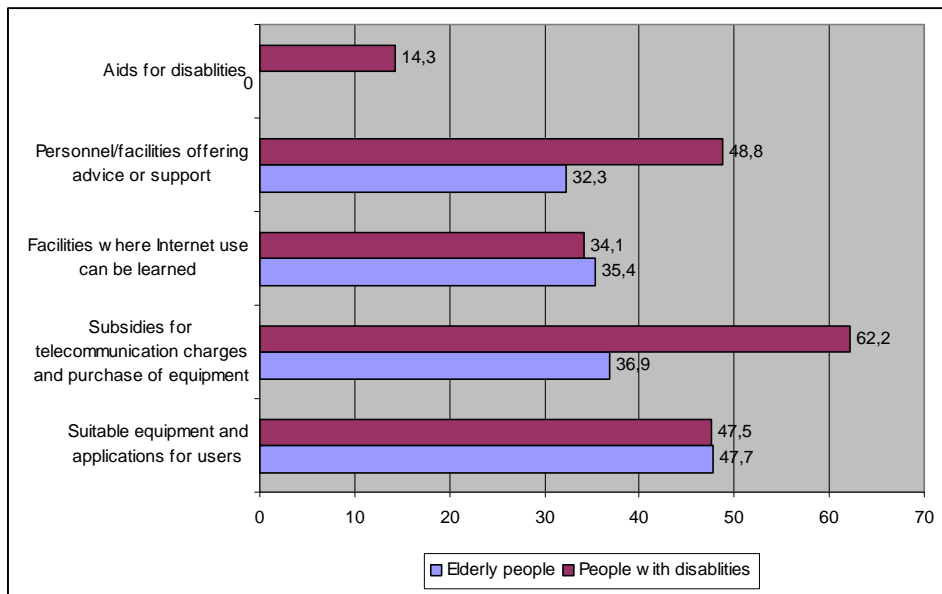
Source: MPT and Ministry of Health and Welfare, 1999<sup>113</sup>

<sup>111</sup> see Chika Sekine: The Role of Universal Design: Closing the Gap of Digital Divide, Universal Design Institute for Information Technology, 2001. (available at [www.udit-jp.com](http://www.udit-jp.com))

<sup>112</sup> Ministry of Posts and Telecommunications Japan: White Paper Communications in Japan, 1999, p. 95

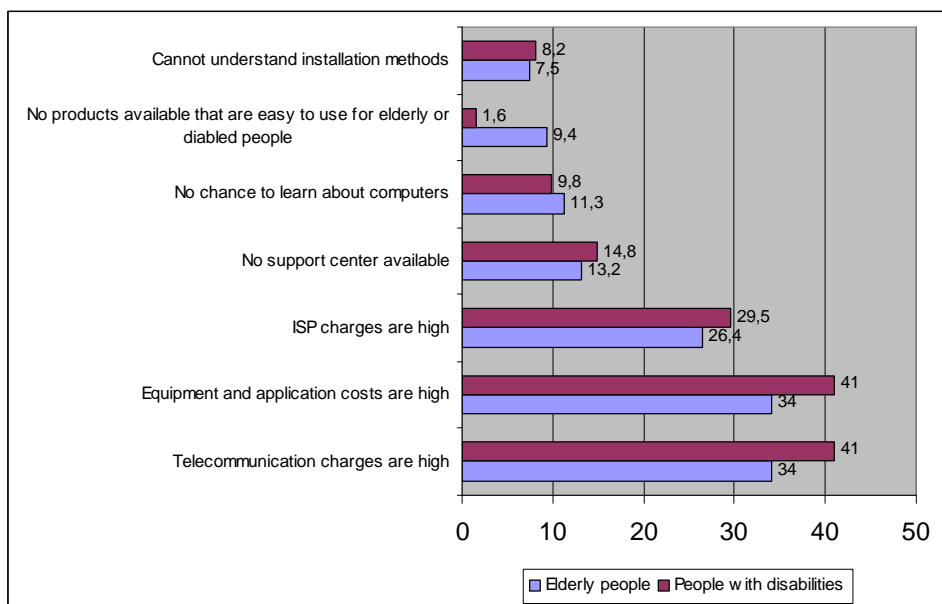
<sup>113</sup> *ibid.*, p. 95

**Figure 10 Factors required for starting Internet use in Japan (multiple replies possible; in %)**



Source: MPT and Ministry of health and Welfare, 1999<sup>114</sup>

**Figure 11 Dissatisfaction in use of the Internet in Japan (multiple replies possible; in %)**



Source: MPT and Ministry of Health and Welfare, year 1999<sup>115</sup>

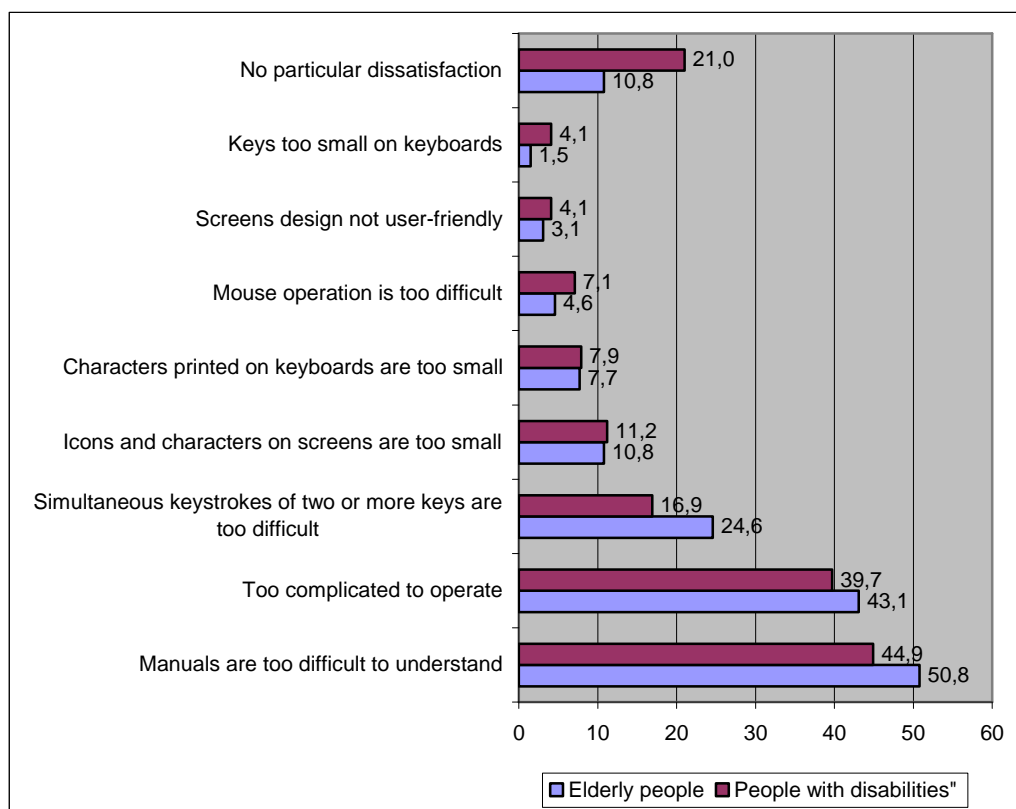
<sup>114</sup> *ibid.*, p. 95

<sup>115</sup> *ibid.*, p. 95

Also, a considerable proportion of those who indeed use the Internet indicate that they are particularly dissatisfied with cost-related aspects (Figure 11). However, there are also indications that older users tend to have problems with the technology as such. For instance, about one half of older computer users find instruction manuals too difficult to read, and about 40% regard the technology as too complicated to operate (Figure 12).

As regards the perceived utility of the Internet, older Japanese appear to use the Internet as a source for information retrieval rather than as a technical platform for doing remote transactions, e.g. in connection with e-government or e-business applications. According to a “Survey of Internet Users”<sup>116</sup> conducted by the Ministry of Post and Telecommunications (MPT) the majority of older users (50+) want to use the Internet for hobbies and for self-improvement in the future. In addition, “communication with people who have similar interests” and “looking for a new goal in life” seems to be an important motivation to use the Internet for about 30% of the respondents. By gender, while male respondents appear to be interested in expanding their opportunities for self-enhancement, women appear to be more interested in gaining career opportunities and experience (Figure 13). As in the case of non-users, Internet costs are also an issue. About three quarters of the respondents regard incurred costs (connection and/or usage charges) as being too high for them. Another barrier in utilising the Internet is seen in “possible invasions of privacy and exposure to online crimes”.

**Figure 12 Dissatisfactions in use of computers in Japan (multiple replies possible)**

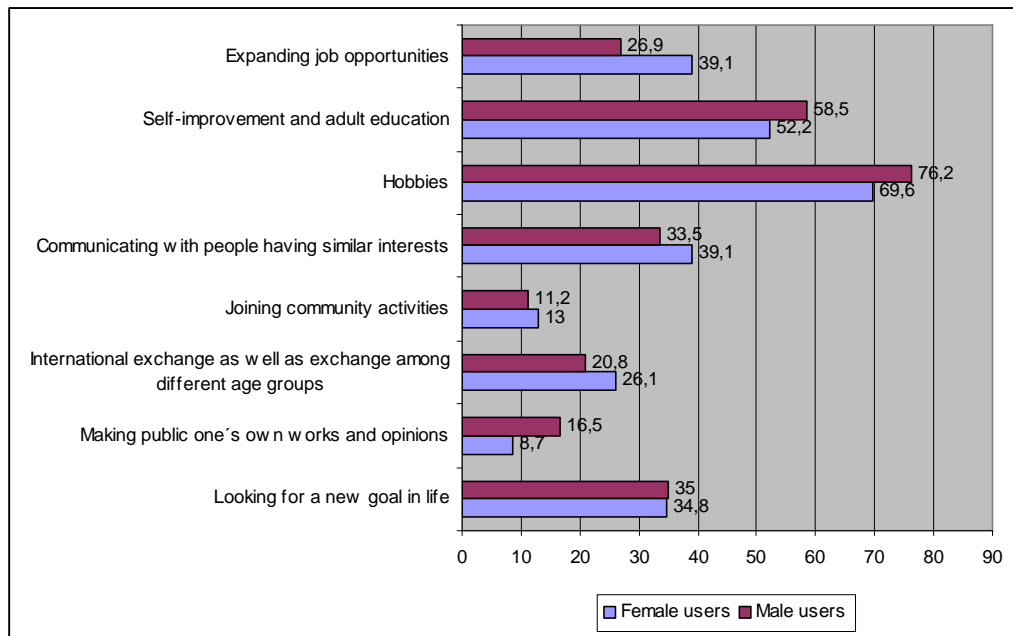


Source: MPT and Ministry of Health and Welfare, 1999<sup>117</sup>

<sup>116</sup> *ibid.*, p. 56

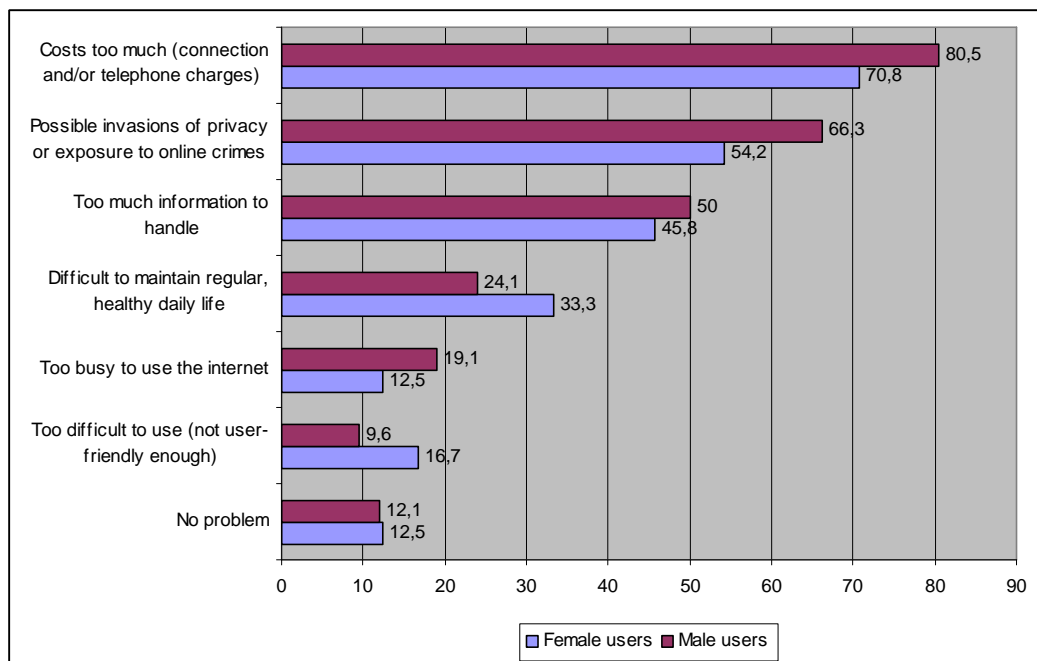
<sup>117</sup> *ibid.*, p. 95

**Figure 13 Purpose of using the Internet among older Internet users in Japan (in %)**



Source: MPT, Survey of Internet users, 1999<sup>118</sup>

**Figure 14 Barriers in using the Internet among older Internet users in Japan (in %)**



Source: MPT, Survey of Internet users, 1999<sup>119</sup>

<sup>118</sup> Ministry of Posts and Telecommunications Japan: White Paper Communications in Japan, 1999, p. 56

<sup>119</sup> *ibid.*, p. 95

The complexity of personal computers and the Internet also causes difficulties, but since many of those surveyed were in a workplace setting, only 10% said that it is “too difficult to use (not user-friendly enough)”. However, female respondents appear to have considerably more difficulties to cope with technical problems compared with male respondents (Figure 14). While younger women have fast become heavy users of the cellular phone Internet, a large proportion of women in their late 30s and over continue to refrain from both PC-based and cellular-based Internet<sup>120</sup>.

According to the Universal Design Institute for Information Technology, Yokohama there are two main strata of the digital divide in Japan<sup>121</sup>. One layer comprises senior citizens and housewives who have very little interest in and/or few incentives to become involved with information technology. The second layer comprises persons with disabilities (which also includes a considerable proportion of the senior population). Here, the problem is inaccessibility of available technologies and services rather than non-interest.

### 3.5 Policies concerning older people and IST

This section presents a comparison and benchmarking exercise from a policy perspective between the EU Member States and Norway, USA and Japan. The information will be presented according to the three main ICT application domains<sup>122</sup> being investigated in SeniorWatch and look at RTD policy. The analysis presented in the following sections attempts to benchmark the current trends in each of these policy environments between Europe (including Norway), the USA and Japan. These trends will provide global patterns according to policy approaches implemented, pursued or planned and reported in the SeniorWatch Country Reports<sup>123</sup>. It should be noted in this context, that a detailed analysis of relevant policies pursued within the individual Member States of the European Union has already been presented in the first report produced within this work package (D5.1). In the following, therefore, merely summarised information regarding the situation internal to the EU is presented as far as it is required for a meaningful comparison with the situation in the USA and Japan.

#### 3.5.1 General IST policy

*EU* The situation across Europe appears relatively uniform with regard to the existence of IS and ICT related plans and/or strategies, with most Member States reporting activity in this area. From the reports it appears that e-Europe initiatives have been one of the dominant driving forces behind the acceleration in IS and e-Government policies. Some countries have also implemented telecommunication and/or universal service policies, indicating efforts to ensure access to IST for all citizens, at least in principle. Three countries (FIN, ES, IRL) appear to be the forerunners in

<sup>120</sup> Chika Sekine (2001): The Role of Universal Design: Closing the Gap of Digital Divide, Universal Design Institute for Information Technology, p. 3. (available at [www.udit-jp.com](http://www.udit-jp.com))

<sup>121</sup> see Chika Sekine (2001): The Role of Universal Design: Closing the Gap of Digital Divide, Universal Design Institute for Information Technology, p. 4. (available at [www.udit-jp.com](http://www.udit-jp.com))

<sup>122</sup> General-purpose applications are those that are likely to be of interest (or not of interest) to older people to more or less the same degree as any other age group. This category would include generic activities, carried out at a distance, such as interpersonal communication, shopping, getting information, working, learning and so on. Care-related applications are those that involve access to or delivery of care services, at a distance, such as social services, social alarm and monitoring services and health care. Accessibility-related applications and requirements are those that relate to needs resulting from functional changes due to disability and/or age, for example changes in vision, hearing, mobility and so on.

<sup>123</sup> It must be noted that the information contained within this document presents the information as reported in the SeniorWatch Country Reports and the SeniorWatch consortium is not responsible for any omissions or inaccurate data. The report for Sweden remains outstanding.

the implementation of IS policy with policy and strategies implemented in several policy areas, i.e., IS planning, e-Government policy, telecoms liberalisation regulation and universal service policy.

A closer look at the general IST policies across Europe shows that older people are also addressed in these policies in different ways. Only two countries (F & D) specifically address and make reference to older people in their general IST policies. Countries without specific policies include older people in other policy areas in particular ensuring access to ICTs through lifelong learning or in relation to the so-called 'digital divide'. Once again e-Europe appears to be a dominant driving force and older people are included as a target group for e-Government initiatives and measures. Other countries have plans in place to close "the digital divide", which include specific targeting of older people.

Country reports also addressed whether telecoms and ICTs have been referred to in general social or welfare policies or strategies in relation to older or disabled people. The reports revealed that only three countries (B, D & UK) refer directly to ICTs in social and/or welfare policy for older and/or disabled people. Other Member States address ICTs in other social policy areas such as ensuring access to ICTs for 'all citizens' in IS plans and in lifelong learning, digital divide and labour market policies. Three countries (B, FIN & D) have general ICT policy that refers directly to empowering older people and appear quite active in this area. Other countries that do not have specific policy in this area have addressed this issue through ICT-based concrete measures and initiatives and yet others did not report any policy activity in this area nor any concrete measures or plans.

The existence of pressure groups lobbying at the policy level for older people is an important variable influencing whether the specific needs and rights of older people are addressed in IS or ICT-related policy or not. All countries (except P) reported the existence of lobby groups for older people and most reported that pressure groups were very active in lobbying issues for older people generally. However, the level of interest shown in ICT issues was generally not as high, for example, two countries (B & F) reported a lot of activity amongst lobby groups but ICTs were not an issue for any of the groups. For other countries with high levels of activity in lobby groups, ICTs were assessed as being of 'marginal' importance as an issue. On the other hand, several of the 'very active' countries perceive ICT applications as an important issue for their pressure groups' activities.

*Norway* The government IT-plan entitled 'eNorway: Information and knowledge society for all' refers to promoting opportunities for the disabled, carrying out analysis of groups that are in danger of being excluded; developing ICT services for adults to be offered through libraries; and examining IT-based products/services for the disabled. The National Council for the Elderly, who advise all ministries affected by the eNorway plan, suggest that it also necessary that actions are implemented to meet the needs of older people in the IS. Another important piece of legislation is the Telecommunication Act or the Telelaw, which aims to provide telecom services aimed at meeting peoples' needs in general and also special needs and that telecom suppliers are required to provide for such needs, mostly related to auditory and visual disability, not to older people specifically.

No specific reference to empowering older people was found in public policy papers, however, the Norwegian Pensioners Association in the general assembly of 1998 established a committee for IT. Nor is there any social welfare legislation or regulation taking into consideration ICT and older people, unless they are disabled or very frail that they are included in the healthcare sector. Several active lobby groups for the elderly exist within Norway and most are concerned with ICT issues, most especially with access to and training in Internet use.

*Japan* The most influential policy document is the Ministry of Health, Labour and Welfare's Annual Report on Health and Welfare (hereinafter abbreviated as: ARHW 99-2000). A chapter is dedicated to promoting IT applications and sets out a set of "Basic Policies for Promoting the Advanced Information and Telecommunications Network Society". According to the basic policies, the active utilization of ICTs and the improvement of services will be encouraged in the areas of health, medical care, and welfare. Various concrete measures are planned and currently being implemented to improve accessibility of basic (and advanced) telecoms services or of ICT products for both older and disabled people.

The Gold Plan 21 is an insurance scheme to support the long-term care of the elderly, which is outlined in the ARHW, and requires all municipalities to create a business plan in 1999 for the first period of the plan from 2000 to 2004. In the scheme of the long-term care insurance system, various business entities, including private companies, can provide in-home care services by meeting certain requirements. A bill to amend the Social Welfare Service Law enacted in April 2000 is expected to contribute to the proper enforcement of the long-term insurance scheme. A key goal of the Bill is to improve the quality, accountability, flexibility and the variety of long-term care products and services and to create new market opportunities, including opportunities for ICT-based products.

The E-Japan Project is aimed at making the country a world leader in the use of information technology within five years by such means as building broadband networks and creating an online government. A panel created by the Public Management, Home Affairs, Posts and Telecommunications Ministry is to study the effects of spreading the use of IT and have predicted that 1.85 million jobs would be created by the time the government completes the project in 2005.

In relation to welfare policies focusing on older people, the main contribution comes from the ARHW, however the main concern is related to establishing a system of long-term care and support for older people, which is absent and thus references to ICT are scarce. Lobby groups for older people do exist but are considered only marginally active and ICT applications and services are not an issue at all for these groups.

*USA* Within the US, multiple national and regional telecoms and IT policy/strategy papers and programs exist that concern themselves with issues of relevance to older and/or disabled people. Almost every government agency, private and public, refers to older Americans in ICT-related policy. There is no one entity responsible for drafting and implementing policies with regard to ICT; instead several agencies have influenced this process of development. Key contributors include US Congress; the Information Technology Association of America<sup>124</sup> (ITAA); the Information Technology Industry Council<sup>125</sup> (ITI); the National Council on Disability (NCD);

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<sup>124</sup> The ITAA provide global public policy, business networking, and national leadership to promote the continued rapid growth of the IT industry. Their goal is to promote ITs robust growth and contribution to the "New Economy." They play the leading role in issues of IT industry concern including information security, taxes and finance policy, digital intellectual property protection, telecoms competition, workforce and education, immigration, online privacy and consumer protection, government IT procurement, human resources and e-commerce policy.

<sup>125</sup> The ITI represents the leading U.S. providers of IT products and services. ITI member companies employed more than one million people in the US and exceeded \$668 billion in worldwide revenues (2000). These two organizations, in addition to numerous others, have as their focus the expansion of IT services throughout the US and have considerable influence on government policy.

the National Telecommunications Information Administration (NTIA); the Presidential Task Force; the Presidents Information Technology Advisory Committee (PI-TAC); the United States Supreme Court; U.S. Department of Education's Community Technology Centres; and the US Department of Commerce Bureau of the Census. In addition to these agencies, the government on both a federal and state level has emphasised IT as a priority.

For the past decade, the US government has explored the digital divide and universal access and a great deal of research and legislation has become available regarding seniors and this topic. In fact, the digital divide is now one of America's economic and civil rights issues. For example, between 1995 and 1998, the NTIA completed four national surveys to inform policy on this topic (Falling through the Net: A Survey of the "have nots" in rural and Urban America (1995); Falling through the Net II: New data on the digital divide (1997); Falling through the Net III: Defining The Digital Divide - A report on the telecoms and Information technology gap in America (July, 1998); and Falling through the Net: Toward Digital Inclusion- A Report on Americans' access to technology tools, October, 2000).

On foot of these activities, a significant amount of national legislation has been enacted over the past few years related to general purpose ICT and key legislative pieces include the Telecommunications Act of 1996, which performed the first major overhaul of telecoms law in 62 years. The goal of this law is to increase competition within the communication market. It is expected to impact telephone service, (local and long distance), cable programming and other video services, broadcast services and services provided to schools. Title Four of the Rehabilitation Act of 1998 (Rehab Act) Subsection 408(B), Amended Section 508 of the Rehabilitation Act of 1993, requires that when Federal Departments or Agencies develop, procure, maintain or use Electronic and Information Technology (EIT), they must ensure that the EIT allows Federal employees with disabilities to have access to and use of information and data that is comparable to the access to and use of information and data by other Federal employees. The Information Technology Management Reform Act of 1996 (i.e., ITMRA or the Clinger-Cohen Act), which took effect August 8, 1996, gives the General Services Administration (GSA) exclusive authority to acquire computer resources for all of the Federal government. In addition, 29 other general purpose ICT bills were proposed during the First Session of the 106th (1999) Congress. The proposed legislation was grouped into six categories: Digital Signatures, Encryption, IT Oversight, Privacy, Research and Development, Security and Miscellaneous Telecommunications/Electronic Commerce. Some of the 29 pieces of legislation reviewed include: H.R. 439, Paperwork Elimination Act of 1999; H.R. 1685, Internet Growth and Development Act of 1999; H.R. 1686, Internet Freedom Act; S.761, Millennium Digital Commerce Act; H.R. 514, Wireless Privacy Enhancement Act of 1999; H.R.1941, Health Information Privacy Act; H.R. 2882, Internet Consumer Information Protection Act. Included in these are references to older people and/or disabled people.

As mentioned earlier, several agencies have as their focus the provision of general purpose IST and some of these organisations focus specifically on the ICT requirements of the elderly and lobby Federal government on their behalf. Some of the following organisations are particularly active in this regard:

American Bar Association Commission on the Legal Problems of the Elderly: The commission examines and responds to law-related needs of older people. It makes referrals and maintains a listing of legal aid offices where older people can get free or low-cost legal assistance, including assistance with ICT/AT issues.

American Society on Aging (ASA): ASA is a non-profit organization providing information about medical and social practice, research, and policy pertinent to the health of older people, including telemedicine and telerehab.

National Institute on Deafness and Other Communications Disorders (NIDCD): NIDCD, part of the National Institute on Health, (NIH), conducts and supports research on normal mechanisms as well as diseases and disorders of hearing, balance, smell, taste, voice, speech, and language. NIDCD develops and disseminates health information to the public based on scientific discovery and includes research on technology use for those with deafness and other communication disorders, including disorders of aging.

Senior Net (SN): Senior Net is a non-profit, educational organization that provides information and services to help older people become computer literate. Locally funded SN teaching sites offer introductory computer classes on various topics, providing older people with discounts on computer hardware, software, and publications.

American Association of Retired Persons (AARP): The AARP is the number one lobby group in the United States. It has branches in each state to lobby at the state level. AARP is a non-profit organization that advocates for older American's health, rights, and life choices. It should be noted that Americans, upon reaching the age of 55, automatically receive their 'membership' card. They conduct research into the ICT and assistive technology issues of relevance to older people and provide feedback to their members. For example, the AARP's research has found senior citizens are the fastest-growing segment of the US Internet community.

The Gray Panthers: The Gray Panthers is also a national lobby group designed to focus on the needs of seniors throughout the US. They and their members can be found at all levels of government, providing guidance, direction and influence when legislative, policy, rules or regulatory activities that directly and indirectly impact seniors are being considered.

The Administration on Aging (AoA): The AoA established by the Older Americans Act of 1965, provides leadership within the federal government for the organization, coordination and provision of supportive home- and community-based services and for generating new opportunities for meeting the needs of older adults and their caregivers, unclosing ICT opportunities. The AoA system is considered the most influential lobby group at the local, state and national levels.

Lobby groups in the United States tend to form around specific issues, rather than specific populations (unless the two coincide). These groups continually reform in response to ongoing or new phases of initiatives. Unlike Europe, it is not unusual to see groups, who have been adamantly opposed to each other, band together when a new topic of mutual interest arises. In the case of ICT, it's perceived benefits (and pitfalls) are recognised by almost all lobby groups leading to unprecedented and often unusual collaborations.

In comparison to Europe and Japan, the US appears to be leading the way with regard to the inclusion and consideration of older people in it's general ICT policy. It is also significant that presidents Bush and Clinton have seen ICT and seniors as a primary focus of their administrations. During Clinton's administration, policies were introduced to advance computing and communications programs and funding was increased in key areas of ICT for older people. In addition, the private sector PITAC committee was established to look specifically at the long-term and fundamental IT needs required to ensure that benefits of the IT revolution were brought to all, including seniors. Seniors are also referred to in almost every new piece of general purpose ICT legislation.

### 3.5.2 Care policy

*EU* In relation to care-related policy, there is a considerable amount of positive activity in this area, with existing and recent policies that address ICTs in general health-care policy. Based on the information from the country reports, it appears that Finland is leading the field in this area in Europe. For those countries that do not directly address ICTs in general healthcare policy (B, F, D, I, L, ES), ICT-based concrete measures and initiatives exist. However, the picture appears less positive in relation to ICT policy in this area addressing older people or family carers. Most countries have no explicit policy or initiatives in relation to the use of ICTs as an empowering tool for family carers, i.e., only two member states (B & UK) make specific reference to the use of ICTs in policy documents empowering family carers. Although several countries (F, G, EL, IRL, I, L & P) do not have explicit policy or initiatives that mention the use of ICTs as an empowering tool for family carers in any policy area, some countries without any policy (AUS, DK, F, NL & ES) report significant potential interest and activity in this area.

The assessment of the general market structure of medical/care systems and the sources of finance in the actual provision of healthcare services revealed that Europe can be divided into four main clusters of countries with regard to general healthcare financing models. All countries - except NL -, have systems that are mainly based either on general taxation or compulsory social insurance. Various supplementary systems are also commonly in place, involving different mixes of private voluntary insurance, direct payments and, for the social insurance countries, general taxation.

The other side of the "market" dimension within SeniorWatch concerns the question of who provides and pays for homecare within the EC and ultimately assessing how ICTs within homecare will be paid for. The reports showed that family carers are the main providers of homecare but this varies across different countries. Concerning the main financing models for homecare across Europe, overall four main clusters were identified. All countries - except D & L -, have systems that are mainly based on general taxation or direct out-of-pocket systems. Various supplementary systems are also commonly in place, involving different mixes of private voluntary insurance, direct payments and general taxation.

ICT within the homecare and telecare sector was also examined and the overall impression of the market is one of low maturity. The only significant ICT-related activity in this sector is within the active alarm services market; these are now widely used in about half of the Member States. In general, the more advanced ICT applications, such as passive alarm services, are only partially used and considered as 'an emerging technology' despite the use of relatively simple technology that has been available for several years. Other reported activity in this area included experimental work with smart home technology, domotica and telemedicine services.

An overview of financial provisions available for ICT equipment to support homecare showed that, in general at least, funding is limited and appears to be based on local arrangements with variations between countries. The main funding activity for homecare devices can be divided into two main clusters, i.e., funding available for a selection of ICT-based devices and countries with no funding sources whatsoever. The main exception here is Denmark, where ICTs required for homecare are provided free of charge. European and national/state funding is available in some countries at local, regional and transnational level for pilot ICT development projects utilising the technologies identified above.

*Norway* Recent health sector plan (the 'Si@!') developed with focus on the potential and use of ICT to improve healthcare services in general. In the Si@!, reference is made to how care professionals and institutions can interact and improve their work through ICT and also to evaluating electronic services for communication between health services and older people. However, the policy paper makes no reference to empowering family carers. Another government policy paper refers specifically to people with dementia and the potential benefit of smart home technology for this particular group.

*Japan* In relation to care-related policy in general, the current focus is on organising long-term care and insurance schemes to cover same. A lack of transparency in the nursing care insurance scheme is considered a fundamental policy weakness. However, various government programs together with increased public awareness of the ageing population has drawn attention to the need to plan the share of social burden of family care and the costs that entails. Various types of care organisations are entering the healthcare market and healthy competition is expected to result in the development of a wide variety of innovative services and products that will include ICTs. In relation to policy focused on older people, there is a very strong movement among lobby groups and the general public to foster principles allowing the elderly and disabled to become involved in determining their own living conditions and payment for healthcare services, i.e., a move away from government directives that make such decisions.

The structure of the Japanese healthcare system is somewhat complex. The general healthcare system is based on a universal medical care insurance scheme with nationally unified medical fees. All citizens are required to subscribe to one of the following schemes: a) government managed health insurance; b) society managed health insurance; or c) national health insurance organised at regional level by the municipalities. Conventional welfare and medical services for the elderly have been restructured into the Long-Term Care Insurance Scheme but unlike the national health insurance scheme, the premium due is determined by the income of the older person. The Long-Term Care Insurance is financed by general taxation (50%) and public contributions (50%). Social welfare councils and foundations, NPO medical corporations, local governments and private organisations provide stationary care. Non-profit organisations dominate the homecare provider market. Home-based elderly requiring long-term care and who have health insurance are eligible for home-visit nursing care but must pay 10% of the cost.

There is considerable effort to increase the number of family carers and to double the number of nursing homes. Older people and people needing nursing care in Japan are eligible for a benefit payment (from the Long-Term Care Insurance Scheme) for both in-home and institutional care services. Also, a new measure called 'in-cash assistance' for those caring for older people at home has been introduced. This assistance is a fixed grant paid to families from general revenue. The reported availability of ICTs in the context of homecare is limited. Alarm services, both active and passive, are widely available but use is limited, however growth is expected.

*USA* As with general purpose ICT policy, several care related policies exist to increase and promote the use of ICTs in general healthcare policy. ICTs are increasingly regarded as an empowering tool for older people and carers alike. The empowerment of older people in this regard and as healthcare consumers is incorporated in almost all aspects of legislation proposed by US government. For example, the

President's New freedom Initiative, the Technology Act of 1998 and the Healthcare Initiative, all boast of being consumer driven. For individuals who are unable to take care of themselves, such as the older and frail old and those with severe disabilities, care is taken that they are represented by a variety of pieces of legislation. For example, programs such as the Ombudsman program and the Client Assistance Programs, provide for a licensed/qualified professional to take the place of a family member (when one is not available) to make decisions regarding life care issues.

Care-related ICT within the US is typically categorised as telemedicine, which is reported as a "hot" topic at the moment. Recently, more attention has been given over to this area and an overview paper was developed for Congress explaining telemedicine and its applications. The American Telemedicine Association (ATA) guides policy in this area and has adopted a set of clinical guidelines for the use of telemedicine for homecare. An ATA Homecare Task Force was established to prepare the guidelines, which include criteria for patient care, health providers and technology. The guidelines have been given to the Healthcare Financing Administration, National Association for Home Care and other bodies for their review. It is expected that as funding streams will be made available for telehealth and when legislation is completed regarding licensure, the increased availability of ICT to support the needs of older people will follow to meet the increased demands of older people and their carers.

The assessment of the US market structure of medical/care systems and the sources of finance for the provision of healthcare highlighted that the US Department of Health and Human Services (HHS), along with the Social Security Administration, is the leading federal agency with responsibility for serving the healthcare needs of older people. HHS strives to support older Americans and to help them lead healthy active lives and provides funding for many initiatives to promote the use and availability of ICTs for seniors. One example is the "Computers for Seniors" program designed to give older Americans access to the Internet and help them make better use of Medicare, Medicaid and other HHS programs. AoA regional offices have been assisting the Healthcare Financing Administration (HCFA) regional offices to make this project happen.

Healthcare funding is available from the Federally funded insurance program known as Medicare. Medicare is available to Americans aged 65 and older and for some disabled Americans. Nearly all persons 65 years of age and older are eligible for Medicare, however most have additional healthcare insurance coverage. Medicare will pay for many health care expenses, but not all of them. In particular, Medicare does not cover most nursing home care; long-term care services in the home, or prescription drugs.

The other major publicly funded health care program is Medicaid. Medicaid is a jointly funded, Federal-State health insurance program for certain low-income and needy people. It covers approximately 36 million individuals including children, the aged, blind, and/or disabled, and people who are eligible to receive federally assisted income maintenance payments. Medicaid is the largest insurer of long term care for all Americans, including the middle class. The Federal and State governments fund Medicaid jointly to provide healthcare for the poor (including the elderly). Medicaid benefits and eligibility vary by state. Medicare and Medicaid healthcare utilisation and costs vary considerably by state. In addition to Medicaid and Medicare, the government offers special healthcare programs to compensate for limited coverage.

The health insurance market is changing rapidly as new types of managed care products are introduced. About 70% of the entire population has private health insurance, most of which is obtained through the workplace. The use of traditional

fee-for-service medical care continues to decline. Most Americans who are ineligible for Medicaid or Medicare or other special programs get health insurance through their jobs or are covered because a family member has insurance at work, known as group insurance. Group insurance is generally the least expensive kind.

The two major publicly funded health programs Medicare and Medicaid and private insurance cover home care expenses. However, the degree of coverage is poor and in order to qualify, individuals must be classified as 'homebound' and may not leave the home, except for medical care. Advocates for the homebound program are currently lobbying the government to remove the 'stay-in-the-home' requirement. Despite wide availability of ICTs (passive and active alarms) and the growing interest in tele-homecare (remote support of family carers) and telemedicine, financial support for home-based ICTs is difficult to obtain. In most circumstances, financial support depends primarily on the physician or other healthcare professional's ability to justify the need for the device. Support is also dependent on the availability of the device and/or service within individual states and the states licensure laws for practitioners.

Despite these restrictions, industries are also increasingly interested in the tele-care/ICT market and are investing escalating resources in the development of "point-of-care" or tele-homecare systems. For example, the U.S. Food and Drug Administration approved the first robotic device, the Home Assisted Nursing Care (HANC), designed to deliver tele-homecare services. The HANC network consists of two units that are placed in the client's home and a central nursing centre. The device allows video-conferencing, monitoring of vital signs and educating a client in the use of assistive technology and disease management.

### 3.5.3 Accessibility-related ICT

Assistive Technology (AT) devices and systems are usually provided under some kind of care and/or welfare scheme on a national level. The following sections focus on the policy fields related to AT, i.e., anti-discrimination regulations/legislation, "design for all" regulations/legislation, and public procurement policies. The existence of such policies can be an indicator of a society's development in AT services and processes.

#### ***Anti-discrimination policy***

*EU* The SeniorWatch country reports were concerned with information about regulations, legislation or initiatives across Europe directed towards anti-discrimination of older and disabled people specifically within the field of telecoms. Only two countries (DK & UK) reported the existence of general anti-discrimination policy for older or disabled people that referred to ICTs and one other (D) is currently in the process of passing laws. Regulations for people with disabilities exist in several European countries (e.g., E, AUS, & D), however these policies do not refer to equivalence of access in ICTs or telecoms. In other countries (e.g., IRL & E) without explicit anti-discrimination legislation, the issue of equivalence of access to telecoms is addressed in other more general integration policies or pieces of legislation.

*Norway* In Norway, Legislation (NOU 1999:26) exists that states that the entire population shall have access to basic telecom services and that these must emphasis electronic ICT services and not create new or add to existing social barriers.

*Japan* No anti-discrimination policy exists in the field of telecoms. Legislation targeting older and disabled people was reported in three areas, i.e., promoting mobile access on public sector transport; promoting environmental access; and accessible public housing and building methods for an ageing society.

*USA* In general, anti discrimination regulation/legislation within the US tends to incorporate all marginalised groups, rather than any one specific population. Several pieces of anti-discrimination legislation exist where age is not specifically mentioned, but apply to seniors and disabled people. The most relevant include the Americans with Disabilities Act (ADA) of 1990 and the Telecommunications Act of 1996.

The ADA prohibits discrimination on the basis of disability in employment, programs, and services provided by state and local governments, as well as goods and services provided by private companies. It applies to all businesses as well as to goods and services provided by governments. The ADA requires that all public facilities be accessible. In addition, all businesses with 15 or more employees are required to make their facilities and IT accessible to employees with disabilities. There is also a requirement under the ADA that each state provides a text telephone relay service and that all public broadcast announcements on TV are text captioned.

Section 255 of the Telecommunications Act requires that manufacturers of telecoms equipment and software ensure that such equipment be directly accessible to people with disabilities if that access is "readily achievable". If direct accessibility is not readily achievable, the manufacturer must make the equipment compatible with peripheral devices used by people with disabilities. Section 255 requires the US Access Board to issue guidelines that set forth criteria for accessibility and compatibility. The Act specifically addresses access needs in other sections also, e.g., 503 addresses video accessibility.

Under Section 508 of the Rehabilitation Act Amendments of 1998, agencies are required to ensure that federal employees and members of the public with disabilities, such as those with hearing or vision impairments, have access to information, computers and networks comparable to the access enjoyed by people without disabilities, assuming doing so would not cause an undue burden on an agency.

### ***Design for all policy***

*EU* Across Europe no explicit regulations or legislation have been implemented nor does it appear that any are in planning phase. However, both the 'design-for-all' concept and its aspirations, although not explicitly labelled 'design-for-all', are increasingly visible in strategy statements and concrete measures. Two countries (FIN & NL) appear to be leading the way in this area in Europe and although no specific legislation or regulations concerning design-for-all exist in these countries, government statements, initiatives and research and development projects exist. Other countries without specific policy or legislation appear to have addressed the design-for-all issue in other general policy areas (e.g., AUS, F, D, IRL, I L & P) and

e-Government policy in particular appears to be a dominant driving force with several initiatives aimed at implementing the sub-concept of Internet-for-all.

*Norway* The e-Norway plan has included reference to the design-for-all concept. The Norwegian State Housing Bank has initiated a plan (1999-2002) where all universities and colleges teaching design courses that include modules pertaining to environments and products for people are encouraged to teach Universal Design principles and include these in their regular curriculum. This initiative is expected to impact on future design and engineering.

*Japan* The only reference to the design-for-all concept was found in relation to accessibility guidelines for computers for older people and people with disabilities.

*USA* In the US explicitly labelled 'design-for-all' legislation does not exist, however it is obvious from the numerous pieces of legislation that do exist that design for all in telecoms and ICT has been part of policy-making for some time. The various pieces of legislation date from 1958 to present day as listed below:

Captioned Films for the Deaf Act of 1958: permitted the Federal Office of Education to purchase, lease, or accept films (primarily recreational films) that provide captions for them, and distribute them through the State schools for the Deaf, as well as through other state agencies.

Library Services and Construction Act Amendments of 1966: Part B of Title IV of the act made federal funds available to state agencies for library services for individuals who were certified by a responsible authority as unable to read or use conventional printed materials as a result of psychical limitations. Such services are provided through public or non-profit library agencies or organizations (e.g. Talking Book Library, Library for the Blind).

Telecommunications for the Disabled Act of 1982: required that workplace telephones used by persons with hearing aids and emergency phones be hearing aid compatible.

Hearing Aid Compatibility Act of 1988: required most telephones manufactured or imported into the United States to be compatible for use with telecoil-equipment hearing aids.

Telecommunications Accessibility Enhancement Act of 1988: allowed the Administrator of General Services Administration (GSA) to take such actions as are necessary to assure that the federal telecoms system is fully accessible to hearing and speech-impaired individuals.

American's with Disabilities Act of 1990: guaranteed the civil rights of people with disabilities by prohibiting the discrimination against anyone who has a mental or physical disability in the area of employment, public services, transportation, public accommodations, and telecoms.

Section 225 of the Communications Act: which was added by the ADA, directs the Commission to ensure that telecoms relay services (TRS) "are available, to the extent possible and in the most efficient manner," to individuals with hearing and speech disabilities in the US. The provision further requires that TRS facilitate the ability of individuals with hearing or speech disabilities to communicate over the telecoms network in a manner that is "functionally equivalent" to the ability of individuals who do not have such disabilities. A fundamental purpose of section 225 is to remove communication barriers within the nation's telecoms network that have deprived individuals with hearing and speech disabilities, including the elderly, of

meaningful opportunities to participate in the economic and social mainstream of American life.

Television Decoder Circuitry Act of 1990: required closed caption circuitry (computer chip) to be part of all televisions with screens 13 inches or larger manufactured for sale and use in the US.

Telecommunications Act of 1996: Section 255 of the Act is particularly relevant and requires telecommunication products and services to be accessible to people with disabilities. The intent of Section 255 is to ensure that telecoms manufacturers and service providers consider including access features during the design and production of their offerings to avoid needless development of new technologies with access barriers. Products and Services covered under Section 255 include all hardware and software telephone network equipment and customer premises equipment (CPE). CPE is telecoms equipment used in the home or office (or other premises) to originate, route, or terminate telecoms, e.g., telephones, fax machines, answering machines, and pagers. CPE that provides both telecoms and non-telecoms functions is covered only to the extent it provides telecoms functions. The FCC's rules cover basic and special telecoms services, including regular telephone calls, call waiting, speed dialling, call forwarding, computer-provided directory assistance, call monitoring, caller identification, call tracing, and repeat dialling. In addition, the new rules cover interactive voice response (IVR) systems and voice mail. IVR systems are phone systems that provide callers with menus of choices.

National Council on Disability (NCD)(1998): called on Congress to take a hard and fast look at what people with disabilities need to make assistive technology readily available. In 1998, Congress recognised that barriers and gaps still existed and directed NCD to prepare a report. The major barriers and the 11 recommendations designed to reduce those barriers were identified and were presented with rationales in the report presented to the President on May 31, 2000.

Section 508 of the Rehabilitation Act of 1998: (Workforce Investment Act) was substantially strengthened in 1998 in its requirement for accessibility in electronic and information technology. When federal departments or agencies develop, procure, maintain, or use electronic and information technology, they shall ensure that the information technology provides federal employees and members of the public who have disabilities comparable access to the information or data unless an undue burden is imposed. Section 508 requires accessibility to the information technology itself.

The Assistive Technology Act of 1998: (preceded by the Technology-Related Assistance for Individuals with Disabilities Act of 1988) requires states to provide assurance of compliance with Section 508 as a condition for receipt of federal funding under the Assistive Technology Act.

Currently (2001), at least six states have passed information technology access legislation and many more have structured policies or executive orders in place that direct their approach to ensuring information technology access. To date, there has been no clear effort to coordinate these state initiatives with federal proceedings.

### ***Public procurement policy***

- EU* The public sector is a major purchaser of ICT equipment and services and can exert significant influence on industry through its purchasing power and policy. Procurement regulations or directives require that equipment and services meet particular accessibility criteria for disabled people. The current situation across European Member States can be divided into two main clusters; one cluster of countries (AUS, B, FIN, NL, P & UK) without any procurement guidelines and the other cluster of countries (F, D, IRL, I & E) with some explicit policy or laws outlining accessibility criteria for public procurement.
- Norway* No specific policy but guidelines are in place that public procurement can improve accessible design.
- Japan* No specific policy but the government is active in defining technical standards for public procurement.
- USA* The 106th Congress established a new Subcommittee on Technology and Procurement Policy. The subcommittee is responsible for conducting a thorough examination of Federal IT management, including a review of state and local models, to improve the acquisition process. Since then, other than selected problem acquisitions, there has not been extensive focus on the IT acquisition process from an overall life cycle management standpoint. For example, the regulations implemented by the US General Service Administration ensure that government agencies only buy fax machines, photocopiers, mobile phones, PCs and software that are friendly to disabled employees.

### ***The assistive technology sector***

- EU* Provision schemes of assistive technology (AT) vary considerably across Europe. In some countries (DK, FIN, F, D & I) legislation is in place that explicitly deals with the AT issue and most Member States appear to have a relatively clearly defined AT service delivery process (e.g., B, NL, UK, D, I, IRL & FIN) and analogous. Several players or sectors appear to be involved depending on the type of AT required and AT delivery processes are predominantly based at regional or local level with final decisions regarding eligibility based at this level also. However, in another cluster of EU countries (AUS, F, P & E) processes range from very centralised and rigorous systems to poorly co-ordinated delivery processes.
- Norway* The AT sector is guided by the National Insurance Act, which stipulates that all residents in Norway have the right to obtain assistive technology free of charge if their disability is long-term, i.e., longer than two years, and if the technology is necessary to improve function. Items are provided irrespective of age and independent of economic means. Any product that can reduce disability will usually be provided. The AT delivery process is very clearly defined in Norway with AT provided at county level by nineteen Technical Aid Centres (TACs), which are responsible for the provision, purchasing, storing, distribution and re-circulation of assis-

tive technology. AT is financed by the National Insurance Administration through public taxation. The Act also ensures implementation and training to use the new device is provided. However, with ICT this is sometimes a problem in this area because training often takes more time than the municipality can offer.

*Japan* Details of the AT sector were largely missing from the report, however no legislation appears to exist beyond the Long-Term Care Insurance Scheme, which presumably provides finance for general AT devices for homecare. The sector appears to be dominated by private organisations and companies.

*USA* The service delivery model of AT within the US varies considerably from state to state. For seniors, AT services tend to be limited mostly to what is perceived to be “durable medical equipment” (DME) such as wheelchairs, ventilators, eyeglasses and hearing aids. ICT and other ATs are not considered to be DME. Unless the technology is deemed medically necessary, third party insurers do not pay. The actual service delivery of AT is reported as poorly delivered and poorly reimbursed for seniors living within the US. This is the case for a number of reasons and in addition to the criterion of medical necessity, most practicing professionals within the US do not receive pre-service (college/university) training in AT. In particular, programs related to gerontology rarely if ever teach AT related coursework. Seniors must receive access to secondary medical care (referrals to speech, occupational and physical therapists) from their primary care physician and very few are trained to recognise the benefits of AT and to recognise when to refer their patients to someone proficient in AT devices and services. In particular, physicians practicing in rural communities have limited information relevant to assistive technologies. Secondly, capitation of insurance programs has severely influenced the provision of care services, with those relevant to health and safety (traditional medical model) placed first.

However, there is a growing awareness of the benefits of AT and delivery of care at a distance via telemedicine/tele-rehab. This is due in large part to activities generated by policy in this area, in particular the following pieces of legislation/regulations:

Technology-Related Assistance for Individuals with Disabilities Act of 1988 (Tech Act): this legislation was passed and signed into law in October 1988. The law provides funding to develop national consumer-responsive programs to meet the AT needs of individuals with disabilities of all ages. It also mandated that each state design a program that met the needs of persons with disabilities, their families and professionals living in that state. Consequently, these programs are highly individualised and differ from state-to-state. The Amendments to the Act in of 1994 strengthened the original Act passed in 1988 by emphasising systems of change and advocacy and required states to perform six specific systems of change and advocacy activities, as well as to provide a specific amount of their Title I funds to a protection and advocacy agency. Again, this legislation was designed for all persons with disabilities, regardless of age. The six mandated priority activities were:

- develop and monitor policies and procedures that improved access to and funding for AT devices and services;
- develop and implement strategies to overcome funding barriers, with particular emphasis on overcoming barriers for underrepresented and rural populations (including seniors);

- coordinate activities among state agencies to increase access to, provision of, and funding for AT devices and services;
- empower individuals with disabilities to successfully advocate for increased access to and funding for AT, as well as to increase their participation, choice, and control in the selection and procurement of AT devices and services;
- provide outreach to underrepresented and rural populations through identification and assessment of their needs, increasing accessibility of services, training of representatives of such populations, as well as training of Tech Act projects' staff to work with such populations;
- develop and implement strategies to ensure timely acquisition and delivery of AT devices and services with special emphasis on children.

The Assistive Technology Act of 1998 (ATA): on November 13, 1998, President Clinton signed into law the ATA. This new law built on its predecessor, the Tech Act and affirmed that technology is a valuable tool that can be used to improve the lives of Americans with disabilities. It also affirmed the federal role of promoting access to AT devices and services for individuals with disabilities of all ages. Under the new ATA, all states and outlying areas were eligible to receive a total of 10 years federal funding for their state AT program counted from the initial year of funding under the old legislation. The main objectives of the ATA are as follows:

- to support states in sustaining and strengthening their capacity to address the AT needs of individuals with disabilities;
- to support the investment in technology across federal agencies and departments that could benefit individuals with disabilities;
- to support micro-loan programs to individuals wishing to purchase AT devices or services;
- to support a public awareness program that is designed to provide information related to the availability and benefits of AT devices and services and is linked to a national public Internet site ([assistivetech.net](http://assistivetech.net));
- to promote interagency coordination that improves access to AT devices and services for individuals of all ages who have disabilities;
- to provide technical assistance and training including the development and implementation of laws, regulations, policies, practices, procedures, or organizational structures that promote access to AT devices and services;
- to provide outreach support to state-wide community-based organizations that provide AT devices and services to individuals with disabilities or that assist individuals in using AT, including focusing on individuals from underrepresented and rural populations.

The ATA is administered by the Department of Education, Office of Special Education and Rehabilitation Services (OSERS) and the National Institute of Disability and Rehabilitation Research (NIDRR). Through these offices, the ATA has authorized funding to support Small Business Innovative Research grants related to AT. Grants are also available to commercial and other organizations for R&D related to universal design concepts; to address the unique AT needs of urban/rural areas, especially for children and older people; and to improve training of rehabilitation engineers and technicians. The President's Committee on the Employment of People with Disabilities provides funds to work with the private sector to promote the development of accessible information technologies. Finally, alternative funding mechanisms may include a low interest loan fund; an interest buy-down program; a revolving loan fund; a loan guarantee or insurance program; a program

operated by a partnership among private entities for the purchase, lease, or other acquisition of AT devices or services; another mechanism that meets the requirements of this title and is approved by the Secretary.

It was also reported that funding for the ATA would be extended through 2003 for those states and territories that have exhausted the 10-year cap on funding. In addition, a process is underway to compile information for congress in order to ascertain what legislative issues must be dealt with in the future and to include ICT as an integral part of any new funding stream. In addition, the New Freedom Initiative adds 40 million dollars to Title III of the ATA, which will be used by states to establish, in cooperation with local banks, credit unions, non-profits, etc. low interest loans for persons with disabilities, including the elderly, to borrow money to purchase AT, home modifications, computers, etc.

Following the enactment of all of this legislation relevant to AT, significant changes have been observed in the US amongst older people. Seniors are now more connected than ever via telephone access and are purchasing computers at an astounding rate. One significant change is that more and more seniors are communicating with their relatives via email from sites that were once considered off-limits. For example, in Denver, Colorado, long-term care facilities (nursing homes) are beginning to set-up 'computer labs' for senior residents. Assistive Technology Partners, University of Colorado has applied for funding to measure the impact on quality of life for seniors living in long-term care facilities who have access to and training for adapted computers and the Internet. Pilot results have shown a significant increase in quality of life and enhanced satisfaction of other family members regarding how their parent or loved one is doing. Seniors who are learning to use the computer and Internet report renewed enjoyment in life and motivation to reconnect with old acquaintances and friends.

### ***ICT-based assistive technology sector***

**EU** This next section provides an overview of the availability of telecoms-based services<sup>126</sup>. The only service reported as available in every country was active alarm services. It must be noted, however that although the service is reported as 'available' this is not an indication of uptake or utilisation, which in some countries is relatively low (see Table X in Annex X). Five countries reported having all the services available (AUS, DK, FIN, F, and I), but again availability is not to be considered an indication of utilisation. TV captioning is commonplace and appears to be offered by most national TV networks across Europe. In addition a text telephony and relay service is available in almost all countries, however it has been reported that service utilisation has declined with the advent of the Internet and SMS. In relation to an e-newspaper/books, this service was reported as available in only seven EU countries (AUS, D, I, FIN, F, LUX & DK).

<sup>126</sup> The following AT services were asked about. Text telephone relay: allow a deaf person with a text telephone to "talk" to a hearing person with an ordinary telephone via a human operator. TV captioning: text captions on TV broadcasts using teletext or other methods. Electronic newspaper: daily broadcast of newspapers for "reading" via voice synthesiser or Braille display. Electronic books (dial-up): provides e-books downloaded by modem and then read via voice synthesiser or Braille display. Audio description (TV): provides a second audio component to TV broadcasts that describes what is happening on the screen. Remote reading of documents: a visually impaired person can contact another person by fax or other means and ask them to read a document for them.

The availability of financial support for impaired people (older and/or disabled) who wish to obtain ICT equipment for use in their homes differs between countries. The type of equipment included here is: PC, fax, modem, Internet browser, voice synthesiser, TV text decoder, TV audio decoder, text telephone, pager and video-phone. Based on the information contained within the country reports, three main clusters of countries were identified as follows. The first cluster includes those countries that identified established direct and indirect funding mechanisms for ICT equipment (B, DK, IRL, NL, P & UK). The second cluster includes those countries (AUS, FIN, F, D, I & E) that did not identify a direct funding mechanism for this type of technology, but rather that funding is based upon an individual case-by-case assessment or by application through the existing general AT funding mechanism. The third cluster includes those countries (LUX) that reported no funding for ICT equipment for use at home.

To summarise, financial support is available in one form or another for ICT equipment for use at home in most EU countries. However, the funding mechanisms involved do not appear very clearly defined and are often dependent on more specific aspects of eligibility for financial support for ICT equipment. For example, the existence of a 'list' of equipment, disability classification, financial circumstances, the usage context for the device, e.g., occupational, educational, daily living, etc., or may be based on price limits, i.e. support only provided up to a certain cost limit.

Overall, the reports highlighted an almost total absence of policy in each of these areas, which was reflected by a poorly developed AT service and complicated AT delivery systems and processes in most Member States. In terms of actual access to and provision of care-related AT and ICT, one country (DK) appears to be the leading nation with all accessibility- and care-related technologies provided free of charge and almost no eligibility criteria being applied.

*Norway* The availability of telecoms-based services was reported as limited. National TV networks provide TV captioning, text telephony/relay and remote reading; all provided by Telenor. However, similar to the rest of Europe, an e-newspaper/book service was not reported. Other ICT equipment, e.g., Internet browser, voice synthesiser, Braille printer, etc., are available and are provided free if the product is required to compensate for a disability. As mentioned, there is no age limit for eligibility of products, however if the older person is living in an institution, the municipality not the state pays for the equipment. Lists of eligible devices exist and are dependent on the awareness of the care professionals and the personnel at the Technical Aid Centres to ensure these lists are kept up-to-date.

*Japan* As Japan's population ages, the home healthcare market is becoming a very lucrative business and the ICT-based AT sector of this market appears to be dominated by private companies, generally more associated with the electronics market. Several of these electronics companies (e.g., Omron Corp., NEC & Sanyo) are now offering remote health monitoring services of the elderly via the Internet. For example, the Zojirushi Corporation noticed that older people use its electric thermos bottles on a daily basis and had them fitted with a wireless transmitter. Once the thermos is turned on or the hot water button is pushed, the transmitter sends a signal to an Internet site, which then sends an e-mail message twice a day to family members that their relative is mobile etc. Other examples of ICT-based AT services include an Internet based Braille literacy support system; a TV with a built-in speech rate converter that slows down the rate of speech in broadcast programs in real time; broadcast news transcription service (TV captioning); and a data broadcast interface for visually impaired, which enables users to receive text in Braille and speech synthesis formats. From the information presented in the report, it ap-

pears that some funding may be available from the compulsory insurance schemes.

## USA

An overview of the ICT-based AT services in the US reported that currently there is no single text telephone relay system responsible to ensure access to adaptive telephone equipment. Each state has individual policies and laws regarding text telephones or fax machines and there is tremendous variation from state to state in the services that are provided. Some states allow text telephone calls at the same cost as voice calls. New regulations adopted last year (2001) by the FCC, provided a new number (711) for access to all telecoms relay services. In addition, kiosks and various adapted displays (text/tactile/video) are provided at public facilities in some states.

In 1990, Congress passed the "Television Decoder Circuitry Act" (became law in 1993) mandating that all new TV sets 13 inches or larger manufactured for sale in the US have a built-in computer chip that decodes captions. This eliminates the necessity of buying a separate decoder (about \$150) for this purpose. The Captioned Media Program (CMP) of the National Association of the Deaf (NAD) provides video captioning, which is a free open-captioned video-lending program funded by the Department of Education. An interesting by-product of the various pieces of AT-related legislation in place is the use of closed-captioning in several restaurants, bars and shopping malls providing text information to customers. In addition audio and video description are available in areas where the local public television station is equipped to participate, e.g., the Descriptive Video Service (DVS) uses a special audio channel available on stereo televisions.

All major telephone directories (yellow and white pages) are available online. Access to these directories is provided at no cost in local libraries and Senior Centers throughout the US. In addition Recordings For the Blind & Dyslexic (RFB&D) is an agency that provides e-books at no cost. Anyone with a documented visual impairment, learning disability or other physical disability that makes reading standard print difficult or impossible is eligible for this service. With more than 83,000 titles in their library, RFB&D is the largest producer in the world of audio textbooks and e-books.

In the US, remote reading services are considered under the ADA of 1990 to be a "reasonable accommodation" that employers may be required to make for disabled employees. Consequently, many companies and agencies offer this service individually. In addition, many communities sponsor a Radio Reading Program via local stations where individuals can tune in to hear the newspaper and other current event documents read aloud. The Fax Reader Project is being developed by one of the Rehabilitation Engineering Research Centers (RERC) to test remote reading using fax machines. The results from this study demonstrated the usefulness of such systems using existing, low cost fax equipment. One of the aims of the pilot study was to assess the utility and cost-efficiency of a remote reading service. Data collected from the study showed that the cost of a remote reading service is comparable to (or less than) the amount typically paid by blind persons hiring a sighted reader for several hours a week.

The availability of financial support for ICT-related AT services varies significantly from state to state. From a national perspective, Medicare/Medicaid will only reimburse for 'durable medical equipment' that typically does not include ICT services and private insurance follows a similar trend. Consequently, ICT-related AT services are often funded by other agencies and programs or not funded at all. The private sector is responsible for significant contributions. For example, IBM recently announced the launch of a unique pilot program with SeniorNet that will enable the organization's members to tailor how they view web pages according to

the personal preferences of each user, eliminating barriers that up to now have kept the web off-limits to millions. IBM also operate the Used Technology Donation Program, in partnership with Gifts in Kind International, to donate used PC systems to non-profit organisations that provide adult education and training. Microsoft operates the Community Affairs Program (created in 1983), which seeks to empower people and communities in discovering a better future through technology. For example, in 2001 Microsoft gave more than \$34m in cash and \$200m in software to 5,000 non-profit organisations to improve technology access to underserved communities, to strengthen profits through technology, and to expand and diversify the technology workforce.

In many situations, funding for AT is provided by non-profit fund raising organisations (local charities) for those individuals who are unable to secure third party funding via insurance. The President's new Freedom Initiative has provided \$40 million dollars in federal matching funds for states to develop low interest loan programs for individuals in need of assistive devices, home modifications or other healthcare items not currently funded by third party insurance.

The availability of financial support for ICT/AT devices is an ongoing national debate and a variety of factors influence individual eligibility. Within the US, citizens are eligible for Medicaid insurance if they have a low income or if they have been diagnosed with a disability. However, a list of 'medically necessary items' exists and insurers have an aversion to adding new technologies to this list. Recently, insurance carriers have been requesting cost benefit data to determine whether or not ICT/AT is a worthwhile benefit for consumers and whether or not it makes financial sense for them to provide this benefit.

### 3.5.4 RTD policy & stimulation

Experimentation with ICTs is essential in developing new ICT-related services and products that meet the requirements of older people and organisations providing care to older people. For example, life-long-learning for older people can be stimulated through experimentation with Internet and Internet-based educational courses.

*EU* An overview of the current R&D policy and activity in the EU Member States highlighted three main clusters of countries as follows: those with specific IST/ICT R&D policy (DK, D, EL, F, E & UK), those without specific policy but with increased activity/funding reported in this area (AUS, B, FIN, I, LUX & NL); and finally those with neither specific policy nor any significant ICT-related R&D activity (IRL & P).

*Norway* Norway fits into the second cluster of European countries because it lacks a specific policy or strategy in this area. Increased funding and significant activity has been observed in the R&D area with respect to ICTs in general, however, very little of this research activity is targeted at the ICT needs and interests of older people particularly in mainstream products and services. However, a lot of effort is currently being directed toward research on ICT in the care sector, mainly through the work of the National Centre for Telemedicine.

*Japan* There is a lot of activity in relation to ICT experimentation and R&D in Japan. One of the driving factors behind this is that Japan is making aggressive efforts to create 'a knowledge-emergent society' where everyone can actively utilise IT. Government policy in this area is to establish an environment where the private sector can exert its full potential and make Japan one of the world's most advanced IT

nations within five years. As mentioned, an increased effort has been observed in relation to delivering ICT-based AT services to older and disabled people driven mostly by the activities of self-help groups and also by the current demographic situation. Lifelong learning is another area being developed at the moment. It is hoped that by the year 2005 the installation of satellite broadcasting facilities will allow everyone to receive information, training and education programs via satellite communications. A priority policy program is steadily being implemented to promote R&D into several fields including science and technology and health and social welfare through the aggressive introduction of an advanced telecoms infrastructure and applications including intelligent transport and geographic information systems.

## USA

In one major piece of legislation exists to promote R&D into IT/ICTs, i.e., the Networking and Information Research and Development Act (NITRD). This Act was introduced to follow-up on recommendations contained in the President's Information Technology Advisory Committee (PITAC) final report, "Information Technology Research: Investing in our Future" (24/021999). The PITAC report stated that in recent years the emphasis of Federal IT research programs has shifted from long-term, high-risk research to short-term mission-oriented research. The NITRD Act is a five-year bill that authorises nearly \$4.8 billion be made available to the six agencies involved in ICT R&D for the years 2000 to 2004. The agencies involved are the National Science Foundation (NSF), National Aeronautics and Space Administration (NASA), Department of Energy, National Institute of Standards and Technology (NIST), National Oceanographic and Atmospheric Administration (NOAA) and Environmental Protection Agency (EPA). This level of funding nearly doubles IT research funding from the current level. The Act also established a new \$130 million pool of grant funding at the NSF. Grants are limited to long-term, basic IT research with priority given to research that helps address issues related to high-end computing, software, social and economic consequences of IT, network stability, security (including privacy) and scalability. All grants are required to be peer reviewed by panels that include private sector representatives.

The Act also provides \$220 million for IT research centers, \$385 million for terascale computing, \$95 million for colleges and universities to establish internship programs for research at private companies that commit to providing 50% of the cost of internships, \$456 million for educational technology research and \$50 million for the NGI.

The National Science Foundation „FY 2003 Budget Request to Congress“ for the Computer and Information Science and Engineering (CISE) Activity<sup>127</sup> is \$526.94 million, an increase of \$12.06 million, or 2.3 percent, above the FY 2002 Current Plan of \$514.88 million. In FY 2003, CISE will focus *inter alia* on „Human Augmentation research“ to expand the capabilities of computers by creating new interfaces, such as speech, touch/tactile sensing, and telepresence. This new focus will serve the increasing population of ageing Americans. These advances will allow the disabled and elderly to more fully participate in the information age and will expand the abilities of all people to enjoy the power of computing and communications.

Many of the 54 million Americans with disabilities are deprived of their independence due to needless barriers. On February 1, 2001, President Bush announced his New Freedom Initiative to promote the full participation of people with disabili-

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<sup>127</sup> [http://www.nsf.gov/bfa/bud/fy2003/nar\\_cise.htm](http://www.nsf.gov/bfa/bud/fy2003/nar_cise.htm)

ties in all areas of society by increasing access to assistive and universally designed technologies, expanding educational and employment opportunities, and promoting full access to community life. The President promised full implementation of Section 508 of the Rehabilitation Act, which requires that all Federal government electronic and information technologies be accessible to individuals with disabilities. According to the report "New Freedom Initiative, A Progress Report on Fulfilling America's Promise to Americans with Disabilities", May 2002<sup>128</sup> the President secured \$65 million for Fiscal Year (FY) 2002 for the Department of Education to:

- Jumpstart research in the area of assistive and universally designed technologies at centres that conduct advanced research in the field; and
- Support the National Institute on Disability and Rehabilitation Research in its work to co-ordinate Federal disability research programs, to assist small businesses in the development and transfer of new technologies, and to award matching grants to states to help persons with disabilities purchase assistive technologies through low interest loans and other means.

The President secured \$37 million of the \$40 million he requested in the FY 2002 budget for the National Institute on Disability and Rehabilitation Research (NIDRR) to award matching grants to states to help people with disabilities purchase assistive technology through low interest loans and other means. The President secured also \$3 million in the FY 2002 budget, substantially increasing the funding for the NIDRR Interagency Committee on Disability Research to co-ordinate the many Federal disability research programs.

Due to the increase in federal funding and grants and the federal commitment to IT research, many private industries as well as non-profit agencies have joined forces to target R&D of ICT. For example, the National Center for Accessible Media (NCAM) is an R&D facility dedicated to the issues of media and IT for people with disabilities in their homes, schools, workplaces, and communities. NCAM's mission is to expand access to present and future media for people with disabilities; to explore how existing access technologies may benefit other populations; to represent its constituents in industry, policy and legislative circles; and to provide access to educational and media technologies for special needs students. The Innovations in Communications Technology Program, operated by Ameritech and The National Council on the Aging, provides funding for creative projects using ICTs to enhance the lives of older people. The program is in its third year and has provided a total of \$300,000 to organisations in the Midwest. However, despite these major advances, much work is still needed to ensure accessibility of services.

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<sup>128</sup> <http://www.whitehouse.gov/infocus/newfreedom/toc.html>

## 4 Summary assessment

This chapter provides a summary assessment based on the analyses and information presented in the previous chapters. This concerns the socio-economic and policy impacts analysed in chapters two of this report as well as the role IST currently plays – and may play in future – to cope with the challenges resulting from these trends. Further to this, policies pursued with regard to IST and older people are assessed. Finally, a SWOT analysis is presented identifying the European Union's strengths, weaknesses, opportunities and threats with regard to accelerating utilisation of ISTs for and among older citizens.

### ***Socio-economic impact of population aging***

As analysed in chapter one of this report, population ageing has profound implications and consequences for all facets of human life. In the economic area, population ageing will have an impact on economic growth, savings, investment and consumption, labour markets, pensions, taxation and intergenerational transfers. Here, forecasts for the European Union, the USA and Japan are all going in the same direction. However, from the three regions investigated, the USA appears likely to experience the slowest ageing process (according to forecasted fertility rate and life expectancy), and the respective indicators (forecasted economic growth, government spending on pensions, spending on long term care) suggest that its economy may be in the best position to cope with the challenges imposed by its population ageing. Japan seems likely to face the strongest economic pressure as its population is ageing at a faster pace compared with the USA and Europe. Also, government spending on pensions as well as spending for long term care are forecasted to experience the strongest rise in Japan while economic growth is expected to fall at a level comparable to the one forecasted for EU. Overall, Europe appears to rank between the USA and Japan as regards the impact demographic developments may have within the economic sphere. However, it is worth noting that - although global and European trends all move in the same direction - the disparity amongst Member States will increase. For instance in 2000, the total dependency ratio (population under 15 or above 65 / labour force) varied from 0.47 (in Germany, Portugal and Spain) to 0.57 (in Sweden) or by 21% (above the lower value). It will in 2050 spread from 0.63 in Denmark to 0.94 in Ireland or by almost 50%. A similar increase in disparities can be observed with regard to the effective economic dependency ratio (population under 15 or above 65 / employment).

In the social sphere, population ageing affects health and health care, family composition and living arrangements, housing and migration. It is currently under scientific dispute whether or not population ageing as such really results in increasing health care costs. However, undisputed is the fact that changes in the age distribution as measured by dependency ratios will indeed dramatically affect the health systems' burden of health care costs via the dramatically decreasing relative proportion of the population earning an income and paying taxes/social security contributions. In addition, it is expected that the extraordinary growth of the proportion of people aged 80 and over will significantly contribute to the growth of the demand for other social services. The sharp increases in the absolute number of disabled will push up spending on publicly-financed long term care as a portion of each nation's GDP. Here again, Japan is expected to face the strongest pressure with the strongest increase (102% between 2000 and 2020) in spending for long term care. In the U.S. the increase of long-term care spending is expected to be lowest (21%) while the picture for the EU is quite diverse again. For instance in Germany, it would rise 38%, from 0.71% to 1.02% of GDP. In France, it would rise 51%, from 0.60% to 0.98% of GDP.<sup>129</sup>

<sup>129</sup> England, Robert S. (2001): *The Fiscal Challenge of an Aging Industrial World*, p. 73.

Health and disabilities are closely related. As regards dependent elderly people, forecasts suggest – despite declining disability rates in relative terms - an increase in the total number of elders living in an institutional setting in all three regions investigated over the coming half century. According the OECD, Japan will see a 74% increase in the number of elderly living in institutions by 2020 and the US will see 33% growth. For Europe moderate growth rates were forecast, for instance: Germany, 26%; France, 29%; the U.K., 18%; Sweden, 27%. The number of disabled living at home will grow even faster. There has been a forecast 74% rise of disabled elderly in Japan between 2000 to 2020<sup>130</sup>. In the US there will be a 41% increase. Germany is expected to experience a 38% increase, France 54% and Sweden 29%.

### ***Trends in utilisation of IST***

Economic growth due to technological progress, and in particular IST economy growth, may impact positively on the challenges described above. It has been estimated that more than 70% of the dramatic growth in productivity of the US economy over the last decade can be attributed to ICT and the spread of these innovations throughout the economy.<sup>131</sup> Whether this marks a historic trend remains to be seen, and its impact on Europe, at least up to now, has been considerably less. The role IST currently plays - and may play in future – in coping with some of the challenges described above has however many more facets and is not just challenging from the view point of macroeconomic and social concerns. Also, they are challenging from a business point of view. As older people compose a larger proportion of the world population, their role as consumers will gain in importance for IST service and equipment providers. The so-called “senior market” is growing world wide and a “new” senior generation with powerful economic influence is rapidly emerging. European industry will miss a huge business opportunity if these market segments are not adequately addressed. At the same time, older people can be expected to become increasingly influential in lobbying for legislation and regulation relating to IST markets.

The extent to which older people ultimately utilise IST for their purposes is not at least influenced by the extent to which IST has penetrated within their general living environment. As revealed in the earlier analyses of the SeniorWatch survey data<sup>132</sup>, PC penetration among European 50+ households basically follows the same distributions across the Member States as penetration within the general public. As regards IST utilisation among the general population, it is obvious from the secondary data presented in chapter three of this report that the USA has a slight head start with respect to PC and Internet penetration when compared with the EU and Japan, and also costs involved in IST usage tend to be lower than in Europe and Japan. However, PC penetration among private households as well as Internet penetration vary considerably across the European Union, and in some Member States penetration levels have been reached that are comparable with those in the US. As regards the mobile arena, mobile telephony is rapidly becoming a complementary access mode in the European Union while Japan and the USA in particular lack behind. The launch of NTT DoCoMo's mobile Internet access system "imode" has been driving a dynamic development of the Japanese market for mobile Internet access since the late 1990s, and the exponential growth in mobile Internet usage reflects NTT DoCoMo's global leadership in this technology. Nevertheless, it should not be underestimated that in some European Member States mobile telephony has gained even more in importance than the average penetration figure for the entire

<sup>130</sup> England, Robert S. (2001): *The Fiscal Challenge of an Aging Industrial World. - A White Paper on Demographics and Medical Technology*. Washington, DC: Center for Strategic and International Studies - Global Aging Initiative, p. 73.

<sup>131</sup> For a broader discussion, cf. Varian, Hal et al. (2002): *The Net Impact Study - The Projected Economic Benefits of the Internet in the United States, United Kingdom, France and Germany* (V.2.0) at <http://www.netimpactstudy.com/>.

<sup>132</sup> See SeniorWatch deliverable no. 5.1: Older People and Information Society Technology – A Comparative Analysis of the Current Situation in the European Union and of Future Trends. April 2002, p. 53.

European Union suggests. For instance, in Finland (18%) and in Portugal (12%), households equipped with *only* mobile telephony are rapidly becoming a significant proportion of all households with a telephone connection

When it comes to IST utilisation among older people, again the USA set the benchmark as regards penetration figures for PCs and the Internet. However, some Member States show penetration figures that are indeed at the same level than those in the US, and others are expected to catch up according to the SeniorWatch survey results. All in all, European elders already make up a considerable proportion of the overall market for IST applications and devices, and this market segment will grow considerably. For instance, the market for computer sales to older citizens (50+) will grow by about 22% between 2001 and 2003 and the Internet market is heading for 60% growth within this time span. Overall, some 32 million Europeans who are today 50 years and older will be on the Web by the end of 2003. Japan in particular lags behind as regards PC-based Internet access among its elderly population.

In all three regions, IST utilisation among older people appears strongly connected with socio-economic factors, i.e. it follows the commonly known characteristics of social stratification such as gender, education, income, etc. Also the prevalence of functional restrictions among older people appears to hamper IST utilisation among this population group in all three regions investigated. In other words, it appears not just as a matter of age as to whether older people want or are able to get involved in IST, rather it is a matter of an overall "social divide". Since the use of digital technologies will continue to play a key role in the future information society there is however a danger of mutual reinforcement. People from disadvantaged social groups who cannot afford access or do not want access to and usage of ISTs are threatened to fall further behind and to become excluded from Information Society opportunities. This can be understood as an interconnected social process. However, the cost factor appears to play a lesser role in the USA when compared with Europe and Japan in particular.

### ***Policies concerning older people and IST in Japan***

Japan is in crisis in terms of its rapidly increasing older population and lack of support to care for this growing group. The problem of senior care is now one that confronts Japanese society as a whole and introduction of the new public long-term care insurance scheme does not appear to be effective. The government lacks any significant policy that adequately deals with the problems occurring in homes where family members are caring for their older relatives and under the current situation, the introduction of the new long-term care insurance system does not promote home-based care. One problem with the new insurance system is that it is administered at the municipal level, of which there are 3,250 in Japan, ranging from cities of millions to villages of a few hundred. Because of this there are tremendous differences in terms of facilities and services available to older people, the availability of professional helpers, the local administration's attitude toward welfare and municipal finances. Premium rates for insurance also vary from one municipality to another. Another issue is the choice between institutionalised care and care in the home, with the former preferred. One purpose of the new insurance system is to promote care in the home so as to reduce the number of cases where people are kept in hospitals, not because of their medical care needs but because they cannot receive adequate non-medical attention at home, thereby reducing total medical care expenses.

Although there is little specific mention of ICT services in the Gold Plan 21, it is clear that business opportunities exist at the municipal and other levels for firms with expertise in support services, health care management systems, e-learning for continuing education of medical care professionals and care providers etc., that incorporate advanced communications technology in their solutions. Other examples are providing emergency alert systems, wellness confirmation and consultation by phone, Tele-alarm care etc., for those living alone and senior citizens in general, on-call medical care providers, helper dispatch stations and information gathering.

There are also growing signs that the 'digital divide' is growing rapidly in Japan and will continue to do so because there is a lack of policy in this area also. One measure of this is based on Internet penetration, which has been shown to be dependent on annual income and area of residence. There is two main strata to the digital divide in Japan: One layer consists of senior citizens and housewives who are a population with very little interest or few incentives to become involved in IT. The other layer consist of disabled people. Here, the problems relate to inaccessibility of ISTs rather than to lacking motivations to use these technologies.

Overall, Japan lags behind other nations in embracing the ICT and IS revolution. Internet usage in Japan is the lowest amongst major industrial nations and when compared with other nations in the Asia-Pacific region. The situation can primarily be attributed to high telecoms fees and restrictions on the use of communications networks stemming from what is in reality a monopoly of the local telecoms market. Other reasons for high fees are that the Internet is built on a low-speed and inefficient voice telephony network and fees are based on linear pricing. The telecoms market was liberalised in 1985, however there still remain restrictions and cumbersome procedures that prevent fair and active competition among telecom carriers. Moreover, obsolete policies and laws require procedures in writing and in person in order to access the Internet. In conclusion, it can be said that institutional problems have been the main cause for the delay in the promotion and use ICTs and the IS for all citizens with older people being especially marginalised.

### ***Policies concerning older people and IST in the USA***

In terms of policy, the US is the most progressive of all the nations reviewed in this report and the legislative strength and impact on the development of general purpose ICTs and care-related ICT (particularly telehealth, tele-homecare, telemedicine, etc.) has been very significant. Probably the most important legislation includes the Telecommunications Act, the Americans with Disabilities Act and the Rehabilitation Act. These pieces of legislation have highlighted the needs and demands of the senior market, especially those with disabilities, and have persuaded private sector businesses to meet these demands.

A major driving force for the implementation of ICT among the senior population has been the explosion of the senior population and the lobby groups representing them. Older Americans compose a larger proportion of the United States' population than ever before. According to the U.S. Census Bureau, since 1900 the percentage of Americans aged 65 and older has tripled, and the older population itself is getting older. In 2000, the number of Americans aged 85 and older - representing 4.0 million individuals - was 43 times larger than in 1900. The older population (65 and older) was 34 million in 1997, which is 13% of the overall population. The proportion of the population 85 and older is growing faster than the population as a whole. Projections indicate that 70 million persons will be 65 and older in the year 2030 representing 20% of the population. It is estimated that the population of 85 years and older will more than double to approximately 8.5 million by 2030. As the so-called "baby boom" generation continues to age, ICT has become a high priority among its members. This population, as a majority, has had and will continue to have tremendous impact on ICT within the United States. This group of people has been influential in lobbying for key legislation such as the ADA and the Telecommunications Act as well as influencing governmental decisions and the financial support of them.

However, despite a superior and highly developed legislative system, in terms of provision and access to ICTs and AT the US public sector does not fare as well as its European counterparts. Currently, the greatest impediment is the lack of financing to fund basic devices for older people at home. In relation to AT, existing laws and policies that fund AT present many gaps that fail to address the needs of many older people and individuals with disabilities. In addition, the laws and policies are frequently misinterpreted or implemented inappropriately by those charged with service delivery. It was reported that Federal agencies and others that

implement federal policy (such as states and local agencies) commonly lack the expertise and resources necessary to implement existing AT laws and policies.

Laws and policies that provide or fund AT must be more comprehensive, more consumer-responsive, better coordinated, and more consistent across agencies and systems to allow for increased access. The current US AT policies are a maze of conflicting definitions, eligibility criteria, philosophical models, and requirements for access to AT. Consumers are left with the daunting task of learning each system's policies to be able to advocate for the AT they need. There is a distinct need for a Federal policy that is comprehensive, co-ordinated, and consistently implemented at state and local levels to ensure equitable delivery of AT to all individuals who are eligible for services.

In the US both mainstream products with access features and new ATs very often have high costs attached to them and are generally not covered by public and private funding sources. The current definitions of 'durable medical care', 'medical equipment', and 'medically necessary items' were enacted in the 1960s, when medical care was viewed primarily as curative and palliative, with little or no consideration given to increasing an individual's functional status or quality of life. In the US, this bias is severely restricting the funding of ICT and ICT-related AT. For example, Medicare does not routinely hearing aids or electronic enlarging equipment. The strict eligibility criteria need to be revised in order to broaden the range of AT provided and to include ICT products and services.

In summary, key issues for seniors concerning all aspects of ICT continue to include affordability, learning about and adopting new technologies, and lack of high-speed access to rural communities. In addition, the rapidly increasing numbers of seniors demands a re-thinking of general provision of medical care and healthcare insurance, and other social services for seniors. There is an increasing 'market' demanding ICT, especially as the senior population ages. The number of seniors within the US is growing significantly and will continue to be a major influence over the next 20 years.

### ***Policies concerning older people and IST in the European Union***

Since the mid-1980s onwards, significant political effort has been put into developing strategies and policies in relation to developing a European Information Society, both on the level of the European Union as well as on the level of individual Member States. One of the objectives of the European Union's strategy is to make sure that Europe's business, governments and citizens continue to play a leading role in shaping and participating in the global knowledge and information based economy<sup>133</sup>. In its action plan "Towards a barrier free Europe for People with Disabilities", the Commission communicated its commitment and aspiration to ensure the Information Society developments will be promoting social inclusion. The main objectives are to promote and ensure accessibility as a way to increase the awareness of social and business actors and to achieve a tangible progress in removing barriers facing people with disabilities, as well as to enhance the opportunities for participation in the Information Society. The objective of social inclusion, at least the e-inclusion aspect, is also an integral part of the eEurope Initiative, which was launched by the European Commission in December 1999. The ambitious objective of eEurope, which is a key element in the strategy to modernise the European economy, is "to bring the benefits of the Information Society within reach of all Europeans". The initiative aims at accelerating the uptake of digital technologies across Europe and ensuring that all Europeans have the necessary skills to use them. The general objectives of this initiative were adopted in June 2000 by the European Council in Feira, Portugal, as the "e-Europe 2002 Action Plan". The Action Plan sets three key objectives and attributes 11 action lines to these objectives. Here, older people are not

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<sup>133</sup> See <http://europa.eu.int/scadplus/leg/en/lvb/l24100.htm> (accessed 25.05.2002)

explicitly mentioned as a specific target group but the individual targets subsumed under action line three generally refer to the participation of all in the knowledge based economy.

A closer look at the general Information Society policies pursued within the individual EU Member States shows that older people are addressed in these policies in different ways, and two countries specifically address and make reference to older people in their general IST policies. Countries without specific policies include older people in other policy areas in particular ensuring access to ISTs through lifelong learning or in relation to the so-called 'digital divide'. Once again e-Europe appears to be a dominant driving force and older people are included as a target group for e-Government initiatives and measures. Other countries have plans in place to close 'the digital divide', which include specific targeting of older people, and some refer directly to ISTs in social and/or welfare policy for older and/or disabled people.

European assistive service delivery systems are quite well developed compared with the USA and with Japan in particular. However, the range of equipment covered, eligibility criteria and other aspects vary widely across the European Member States. Moreover, IST equipment for day-to-day use is often not covered. Provision schemes of AT vary considerably across Europe. In some Member States legislation is in place that explicitly deals with the AT issue and most countries appear to have a relatively clearly defined AT service delivery process and analogous. Several players or sectors appear to be involved depending on the type of AT required and AT delivery processes are predominantly based at regional or local level with final decisions regarding eligibility based at this level also. However, in another cluster of EU countries, processes range from very centralised and rigorous systems to poorly co-ordinated delivery processes. Moreover, recent research<sup>134</sup> revealed that, an oligopolistic structure of national AT markets tends to keep prices high and facilitates a situation where AT providers are not very sensitive towards new technological developments.

In relation to care-related policy, there is a considerable amount of positive activity in this area on the level of the Member States, with existing and recent policies that address ISTs in general healthcare policy. For those countries that do not directly address ISTs in general healthcare policy, IST-based concrete measures and initiatives exist. However, the picture appears less positive in relation to ICT policy in this area addressing older people or family carers. Most countries have no explicit policy or initiatives in relation to the use of ISTs as an empowering tool for family carers, i.e., only two member states (B & UK) make specific reference to the use of ISTs in policy documents empowering family carers. In general, the European care sector can today be described as very open-minded towards the implementation of innovative, IST-based care solutions. Decision makers expect better and broader services that are empowering older people to lead an independent life for a longer time, and their attitudes towards IST implementation in care delivery processes as well as their expectations as to where the industry is moving in the field of IST are very positive. However, the care sector has – up to now - shown very few signs of utilizing new technology to improve products and services. The only significant IST-related activity in this sector is within the active alarm services market; these are now widely used in about half of the Member States. In general, the more advanced ICT applications, such as passive alarm services, are only partially used and considered as 'an emerging technology' despite the use of relatively simple technology that has been available for several years.

The public sector is a major purchaser of ICT equipment and services and can exert significant influence on industry through its purchasing power and policy. Compared with the US, European public procurement policy appears less advanced. The current situation across European Member States can be divided into two main clusters; one cluster of countries without any procurement guidelines and the other cluster of countries with some explicit pol-

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<sup>134</sup> Price Partnership Limited and Institute for Rehabilitation Research: Study on Technology Trends and Future Perspectives within Assistive Technology, 2000 (available at: [www.cordis.lu/ist/ka1/special\\_needs/library.htm](http://www.cordis.lu/ist/ka1/special_needs/library.htm))

icy or laws outlining accessibility criteria for public procurement. Also, anti-discrimination legislation and/or regulation has just started to emerge on the European policy agenda. Today, only two Member States reported the existence of general anti-discrimination policy for older or disabled people that referred to ISTs and one other is currently in the process of passing laws. Regulations for people with disabilities exist in several European countries, however these policies do not refer to equivalence of access in ISTs or telecoms. In some countries without explicit anti-discrimination legislation, the issue of equivalence of access to telecoms is addressed in other more general integration policies or pieces of legislation.

### **European strengths, weaknesses, opportunities and threats**

In general, the ICT market has an increasingly significant role in the European economy, and analysts are forecasting further expansion across Europe<sup>135</sup>. Despite a slow down during late 2000, an overall EU market growth well above the average GDP growth is predicted. This is also reflected by the increasing number of people employed in the sector. Against this background and due to the demographic developments described earlier in this report, the European 50+ market offers significant opportunities for the telecommunications services industry, for equipment providers and for information service providers to expand their current customer base and develop new markets. This concerns both residential markets (general purpose IST, accessibility-related IST) as well as professional markets (care-related IST). The prevalence of functional restrictions among a large part of potential IST customers will however require ubiquitous *design-for-all* solutions to be developed if the market potential outlined above is supposed to be fully exploited. There are currently 26 million EU citizens (21%) aged of 50 years and over which are severely functionally restricted (hearing, vision, dexterity) in using IST products and services (17% of those in the age range between 50 to 60 years), and as described in chapter 1 of this report, the absolute number of disabled people will continuously rise over the coming decades.

Despite a significant EU-wide overall market potential for IST products and services tailored to older people, there are several hurdles impeding rapid exploitation of this market potential from a supply-side perspective. Cultural diversity and multilingualism contributes to the fragmentation of the overall EU market place, e.g. compared with North America were some 299 million potential customers speak the English language<sup>136</sup>. In non-English speaking countries, many IT terms are in English or phonetic expressions of English terms and are hard to understand without knowing the original English words. Particularly for older Europeans, this

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<sup>135</sup> See: European Information Technology Observatory 2002 (EITO). (available at [www.eito.com](http://www.eito.com)) EITO is a broad and unique European initiative. Its objective is to provide an extensive overview of the European market for information and communications technology and to render services to this industry, to users and public authorities. EITO publishes a yearbook which presents the most comprehensive and up-to-date data including the entire information and communications technology market in Europe. Founders and current members (2002) of EITO are the European information and communications technology industry association (EICTA), the European trade fairs CeBIT Hanover, SIMO Madrid and SMAU Milan, the German information and communications industry association BITKOM Servicegesellschaft. From the very beginning the EITO has been strongly supported by the European Commission, Directorate General Enterprise and Information Society, and since 1995 by the Directorate for Science, Technology and Industry of the OECD in Paris.

<sup>136</sup> English is profoundly dominant (and is often the only language) in over 30 territories including: Anguilla, Antigua and Barbuda, Ascension, Australia, The Bahamas, Barbados, Belize, Bermuda, Dominica, England, The Falklands, Grenada, Guyana, the Isle of Man, Jamaica, Montserrat, Northern Ireland, St Kitts & Nevis, St Helena, St Vincent & the Grenadines, Trinidad & Tobago, the USA, and the Virgin Islands. In the following countries it is dominant but at least one other language is significant: Canada, the Channel Islands, Eire, Gibraltar, Liberia, New Zealand, St Lucia, Scotland, South Africa, and Wales. Some believe that Spanish will soon be as significant in the USA as English. Most recent estimates suggest that 377 million people speak English as a first language (Crystal 1997). The two largest concentrations are the USA (226 million) and the UK (56 million). As a percentage of the world's population, this means that 6.2% use English as their mother tongue, second only to Chinese. (see: <http://www.esu.org/faqs.html>, accessed at 25<sup>th</sup> May 2002)

tends to be a problem because many elders did not have any opportunity to learn English at school.

Moreover, current ISTs such as the PC are a powerful tool for general purpose applications and services use but are not always easy to use for non-experienced users. There are currently some 80 million older Europeans (69% of the EU 50+ population) who are in principle open minded towards IST but only 20 million possess advanced computer skills (40% of those who have ever used a computer). Despite recent developments regarding *pervasive computing devices*, i.e. non-PC devices such as the Screen Phone, computer literacy can still be seen as a major prerequisite for being able to access the online-world. More fundamentally speaking, a certain proportion of the European seniors population is not ready to use IST-based services even if they were in principle interested in particular applications. It should however be noted in this context, that the north/south divide identified regarding older European's involvement in IST reflects considerable disparities with regard to the maturity of national markets. Some Member States such as Sweden, Denmark and the Netherlands have a considerable head start here.

As regards care-related IST solutions, the current fragmentation of available technologies and related services considerably hinders broader market deployment. Potentially, new technology can play a greater or lesser role in most activities involved in service provision. However, without an existing major market presence, the take up of new technology solutions by service providers is likely to be limited, and unless service organisations can see real benefits in respect to improved efficiency, quality and competitiveness then they are unlikely to adopt new technology.

Market fragmentation can also be observed regarding the European assistive technology (AT) sector. As revealed by a recent study<sup>137</sup>, dominating SMEs tend to address local, regional, sometimes national markets rather than preparing for entry to international markets. Moreover, they tend to specialise in particular sub-sectors addressing quite narrow market segments. An oligopolistic structure justified by the relatively small number of companies active in the field yields a situation where prices remain at relatively high levels (due to high development costs and lacking competition) and sensitivity to technological advances is not very pronounced. Another factor facilitating the AT market to remain oligopolistic is the intervention of third party purchasers or intermediary organisation that are given the task of assessing disabled and elderly people, and prescribing solutions. It is much easier for them to deal with few technology providers rather than with many. In conjunction with this market structure, inefficient distribution channels provided by AT provision systems have tended to create a "communication gap" between market actors and end users. As a consequence, field actors tend to have not enough knowledge of the end user needs and requirements, which is necessary to produce high quality products.

Despite the structural problems described above, Europe has some remarkable assets to rely upon when developing new IST markets. These include, e.g., the indisputable leadership in the mobile technology sector. Now, future generation mobile technology is destined to become one of the basic technologies of the Knowledge Society. Overall, there is an abundance of knowledge relating to IST at the scientific front that awaits further exploitation. Apart from national bodies, the Commission of the European Communities has significantly contributed in enhancing the existing EU-wide knowledge base since the early 1990s through its successive Framework Programmes. In this context, a considerable number of Research and Technological Development (RTD) projects were funded which particularly aimed at developing technology solutions serving the needs and requirements of older/disabled people.

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<sup>137</sup> The study focuses on Assistive Technology in the sense of any technical system, equipment or instrument used by a disabled person, especially produced or generally available, preventing, compensating relieving or neutralizing the impairment disability or handicap. See: Study on Technology Trends and Future Perspectives within Assistive Technologies. Price Partnership Limited and Institute for Rehabilitation Research, October 2000 (available at: [www.cordis.lu/ist/ka1/special\\_needs/library.htm](http://www.cordis.lu/ist/ka1/special_needs/library.htm))

The involvement of all European Member States such projects can be regarded as an indicator for the broad knowledge base which now exists throughout the EU. Despite the brain drain mentioned earlier in this report, the European human potential is remarkable. Cultural diversity and multilingualism that have been identified as a hindering factor in the development of an EU-wide seniors market for IST products and services, are on the contrary assets when generating new ideas. The high participation of the Southern European countries in these RTD efforts indicate that the distribution of scientific knowledge related to IST solutions for older/disabled people and/or their carers does not follow the same north/south gradient identified with regard to current IST uptake among these groups<sup>138</sup>.

A large part of the RTD efforts mentioned above did however not progress further than the experimental or pilot stage. The actors involved obviously faced significant problems in transferring the technologies developed into marketable products. In this context, a recent study<sup>139</sup> identified the need for the actors involved to adapt a “demand pull” approach rather than “technology push” approach. In other words, the needs, requirements and preferences of the potential users need to be taken into account more strongly during the RTD process. Terms such as User Centred Design (USD<sup>140</sup>) and Participatory Design (PD<sup>141</sup>) can be mentioned

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<sup>138</sup> For details see: European SeniorWatch Observatory and Inventory: Country reports, deliverable no. 4.1, project no. IST-1999-29086, and also Constantelou, A. and S. Zambouloukos (2002) 'Civilising Technologies in Healthcare Provision: Experiences and Prospects for Europe', STAR Issue Report No. 31, available at [www.databank.it/star](http://www.databank.it/star)

<sup>139</sup> Study on Technology Trends and Future Perspectives within Assistive Technologies. Price Partnership Limited and Institute for Rehabilitation Research, October 2000 (available at: [www.cordis.lu/ist/ka1/special\\_needs/library.htm](http://www.cordis.lu/ist/ka1/special_needs/library.htm))

<sup>140</sup> UCD is a highly structured, comprehensive product development methodology driven by: (1) clearly specified, task-oriented business objectives, and (2) recognition of user needs, limitations and preferences. Information collected using UCD analysis is scientifically applied in the design, testing, and implementation of products and services. When rigorously applied, a UCD approach meets both user needs and the business objectives of the sponsoring organisation

<sup>141</sup> Participatory Design (PD) is an approach to the assessment, design, and development of technological and organizational systems. The impetus of Participatory Design is to encourage the active involvement of potential or current end-users of a system in the design and decision-making processes. Participatory Design stretches across a wide range of perspectives, backgrounds, and areas of concern so there can be no single definition of Participatory Design. However, the history of Participatory Design clearly shows that it advocates and values the perspective, knowledge, skills and involvement of the end-user for designing a system that creates progressive opportunities for all parties involved.

as catch words here. Participation of senior citizens in the design process in particular is important and effective for two reasons. Firstly, seniors will sooner or later become a major user group of IST-based services and products on grounds of the demographic developments described earlier in this report. Secondly, ISTs that are easy to use for seniors will also become easy for everyone in most cases.

This is the general background against which the European Union's strengths, weaknesses, opportunities and threats with respect to accelerating utilisation of ISTs among older people and their carers are summarised in Table 22. The SWOT approach pursued in this context follows the analytical framework developed earlier in the project<sup>142</sup> and thus considers three different perspectives, namely a demand perspective, a supply perspective and a policy perspective.

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<sup>142</sup> See SeniorWatch deliverable no. 1.2: SeniorWatch Analytical and Methodological Framework, January 2002

Table 22: SWOT with respect to accelerating IST utilisation among European older citizens and their carers (in four parts)

Demand Perspective			
Strengths	Weaknesses	Opportunities	Threats
<p>Ÿ The majority of the 50+ populations has positive attitudes towards IST (e.g. about two third are in principle open minded towards new technologies)</p> <p>Ÿ A large proportion of the 50+ population has already gained at least rudimentary hands-on experience with IST (e.g. 40% of the 50+ have ever used a computer, 48% possess a mobile phone)</p> <p>Ÿ Penetration &amp; growing familiarity of IST in society in general will impact on IST demand of older people</p> <p>Ÿ Demand for IST will increasingly come from people with (slight and severe) functional restrictions</p> <p>Ÿ High penetration level of ISTs used in an administrative context prepares the ground for more advanced solutions within the care sector</p> <p>Ÿ High awareness of the potentials IST generally holds for the care sector yields an open-minded climate regarding its utilisation at the decision maker's level</p>	<p>Ÿ Overall, the EU-wide relative growth rate of first time Internet usage among the 50+ population has been declining during recent years, and this indicates that the pace of Internet uptake among older Europeans is slowing down</p> <p>Ÿ The current IST north/south gradient regarding awareness, interest, actual usage, skills, etc. hampers the development of an EU-wide market place for IST tailored to the needs of older people</p> <p>Ÿ Lack of advanced IST skills among European elders hinders full exploitation of IST (e.g. 60% of those who have already tried out a computer possess rudimentary computing skills at best or even have virtually no clue)</p> <p>Ÿ The lack of awareness/interest about/in IST among the older population according to socio-economic stratification fosters the development towards a two tiered society (e.g. one third belong to the "digitally challenged")</p> <p>Ÿ High telecommunications/ISP costs hamper broader utilisation of IST services due to the price sensitivity of the market segment in question (e.g. compared with the USA)</p> <p>Ÿ Non-affordability of services and/or equipment hampers broader IST uptake among low income groups in particular</p> <p>Ÿ Current institutional/organisational settings hinder wider implementation of advanced IST solutions within the care sector (e.g. lack of managerial and organisational capabilities, costs involved, anticipated non-acceptance of clients)</p> <p>Ÿ Lacking market presence of advanced IST solutions in the care sector make investment decisions difficult to take</p>	<p>Ÿ Articulating consumer power through aging organisations may pressure IST to improved access to IST and to offer better services</p> <p>Ÿ Targeted measures can rise awareness among the "digitally challenged" about the benefits IST may hold for them</p> <p>Ÿ Public access points can enable those who have cost-related concerns about ISTs to get involved in it</p> <p>Ÿ Pressure on public care sector from ageing/consumer organisations for alternatives to institutional care can drive the implementation of advanced home care solutions.</p>	<p>Ÿ Those who are not interested in IST or can not afford to access/use it are at risk of being increasingly left behind through a reinforcing social process of non-participation</p> <p>Ÿ Non-articulation of consumer needs and requirements of older people through organisations representing them facilitates non-recognition of this market segment at the side of industry</p> <p>Ÿ North/south IST gradient facilitates inequality across the EU with regard to social/economic participation of older citizens and their quality of life as more and more traditional services are going to be offered with help ISTs (e.g. danger of EU-wide medical/care divide)</p>

## Supply Perspective

Strengths	Weaknesses	Opportunities	Threats
<p>Y Well developed telecommunications infrastructures (e.g. fixed/mobile telephony, ISDN, cable) enable wide delivery of services</p> <p>Y Well developed 50+ markets in “fore-runner countries” can be utilised as initial point for further market development (e.g. nearly 60% of the current 50+ population will have gained first hands-on experiences with the Internet by the end of 2003 in Sweden, Denmark and the Netherlands)</p> <p>Y Technology leadership in some IST markets (e.g. in the mobile arena) can be exploited to develop innovative IST devices and services</p> <p>Y An abundance of scientific and technological expertise in telecare and assistive technologies can be exploited to develop innovative IST devices/services (e.g. large no. of research and pilot projects funded by the EU or national bodies)</p> <p>Y The north/south gradient observed with regard to IST penetration does not concern distribution of scientific expertise (e.g. experts from all Member States participate in EU-funded RTD activities to equal extent)</p>	<p>Y The market potentials have not yet been adequately addressed by IST industry (e.g. half of the 50+ population – independent whether users or non users – does not see their interest in adequate design being considered by IST, and 70% see IST always connected with younger people in the media)</p> <p>Y The design-for-all philosophy has not yet gained enough recognition among IST manufacturers and service providers (in the USA large players such as NOKIA have, e.g., started to address accessibility issues from a strategic viewpoint)</p> <p>Y Fragmentation of the overall EU seniors market due to cultural diversity and language barriers makes it difficult to develop an EU-wide market place</p> <p>Y Structural deficits of the AT market facilitate a situation were the sector is not sensitive to technical innovations and tends to keep prices high (e.g. oligopolistic structure and role of intermediate organisations)</p> <p>Y Problems in transferring research results into marketable products hinders uptake of innovative solutions (e.g. majority of publicly funded RTD projects did not progress further than the experimental or pilot stage)</p> <p>Y The diversity of social/care systems &amp; complex institutional set-up with highly fragmented competencies make it difficult to develop an EU wide market place for advanced care-related IST applications.</p>	<p>Y Huge market potentials (e.g. EU-wide currently some 122 million 50+ of which are two third generally open minded towards ISTs) provide opportunities to expand the current customer base and develop new markets for telecommunications providers, IST manufacturers and service providers</p> <p>Y Addressing the needs of older consumers may well pay off in other markets also (e.g. products which are easy to use for older people will be easy to use for all consumers in most cases)</p> <p>Y Improving IST skills/knowledge of older people may add millions of potential customers to IST based services (e.g. e-commerce)</p> <p>Y Designing products and services for the widest possible range of user requirements including those older people may have can yield valuable expertise/knowledge for developing applications within diversifying IST environments (e.g. ubiquitous computing, using the Internet while shopping in the street or travelling by care).</p> <p>Y IST can contribute to realize efficiency gains in the care sector, and this can help care providers to cope with increasing cost pressure.</p>	<p>Y Manufacturers and service providers who do not address the needs and requirements of older users may sooner or later lose their ability to compete in increasingly saturated IST markets</p> <p>Y Not utilising the expertise and knowledge of older end users and/or of organisations representing them would mean to waive a valuable opportunity to gain competitive advantages</p> <p>Y Lacking market orientation of publicly funded RTD efforts relating to older and/or disabled people would constrain uptake of innovative IST solutions for this groups (e.g. many IST initiatives are pilot projects and often cease after the pilot phase without technology/knowledge transfer)</p> <p>Y Solely focusing publicly funded RTD efforts on the development of marketable products holds the danger that basic research within the AT sector may become impossible due to the structural peculiarities of this field (e.g. relatively small no. of end users)</p> <p>Y Application of outdated catalogues or ‘lists’ of eligible AT/IST and strict eligibility criteria for funding hinders the development/implementation of innovative IST solutions</p>

## Policy Perspective

Strengths	Weaknesses	Opportunities	Threats
<p>Y Pan-European policy such as the e-Europe initiative is driving national policy concerning participation of older/disabled people in ISTs</p>	<p>Y There is a lack of co-ordination between different policy lines concerned when aiming at accelerating IST access/usage among older/disabled people (e.g. telecommunications policy, social policy, health care policy, procurement policy, monitoring activities related to the Information Society)</p>	<p>Y Current &amp; future demographics indicate staggering growth amongst older population as a target market, which in turn is driving policy in this area</p>	<p>Y High costs of telecoms &amp; lack of high speed access in some countries may reinforce the current north/south IST gradient observable within the EU</p>
<p>Y There are IST-related policies in place to enact binding legislation concerning older/disabled people and IST</p>	<p>Y There is lack of co-ordination between EU policies and national policies directed towards accelerating IST uptake among older/disabled people</p>	<p>Y IST offers the possibility to develop new solutions that help meet costs for an ageing society</p>	<p>Y Increased dominance of market forces in determining individual and/or institutional options &amp; choices as regards service delivery (e.g. on-line vs. physical presence) may penalise those who prefer non-electronic service delivery (e.g. some saving banks already offer reduced fees if a transaction is being made on-line)</p>
<p>Y E-Government initiatives show increased interest in older people as a target population</p>	<p>Y There is a lack of awareness &amp; discussion on a public level about the potentials IST offer to older people (e.g. question of awareness, legislation &amp; economy rather than of technology)</p>	<p>Y Labour market shortages are driving policy initiatives in lifelong learning &amp; IT training &amp; education</p>	<p>Y The lack of awareness among industry of market opportunities presented by older/disabled people may bate international competitiveness of European players (e.g. compared with market players from the USA)</p>
<p>Y Political awareness to extend the Information Society to all citizens is increasing on national level</p>	<p>Y Initiatives are formulated at a top-political level with little observed input from lobby groups, and the private sector tends to be excluded from policy discussions</p>	<p>Y Consideration of older/disabled people is essential when creating democratic access to public information resources</p>	<p>Y Aging organisations and lobby groups that do not pay attention to IST-related issues potentially relevant for their clientele run the risk of fading out an increasingly important aspect of their clientele's day-to-day life</p>
<p>Y The interest in implementation of anti-discrimination legislation is increasing, and the goal of equality of access as a political driving force behind this is gaining in acceptance</p>	<p>Y There is a lack of visibility in implementing policy directed towards the acceleration of IST access/usage among older/disabled people</p>	<p>Y There is increasing awareness amongst national governments of the need to compete with international market structures</p>	<p>Y There are conflicting priorities within healthcare resources in most EU countries, and IST as a solution to the needs of older people's care may not be perceived a priority</p>
<p>Y The EU-wide knowledge base has been strengthened over the last decade through extensive funding of IST-related RTD efforts targeting older/disabled people (e.g. under the subsequent EU RTD frameworks, through national programmes)</p>	<p>Y The absence of legislation to enforce the private sector to adopting universal design principles has tended to leave the issue of accessibility of ISTs to market forces exclusively (e.g. the consideration of accessibility issues at the side of important market players such as NOKIA is not at least caused by respective legislation/regulation)</p>	<p>Y IST can play a useful role in promoting active ageing (e.g. aiding communication, widening access to cultural opportunities, fostering interest &amp; motivation, increasing quality of life)</p>	<p>Y Costs for accessible IST devices may remain high because the market may remain to be construed as 'specialist' &amp; not universal</p>
<p>Y There are many successful initiatives within the EU to accelerate the usage of IST among older/disabled people (awareness rising campaigns, training measures, Internet cafés serving as public access points, etc.) which can serve as best practice examples</p>	<p>Y Procurement and use of accessible ISTs is in not considered as a public issues in all Member States</p>	<p>Y Public &amp; political debate is increasingly debating impacts of the aging population, and this may facilitate wider recognition of the potentials IST generally holds for this group</p>	<p>Y Both, socio-economic reinforcement of non-involvement in IST as well as the north/south gradient regarding IST usage among older people may widen the digital divide on the national level as well as EU-wide</p>
<p>Y The public sector is leading the way in e-accessibility (e.g., web pages) initiatives and, thus, sets a stimulus for the private sector also.</p>	<p>Y The potentials IST generally holds with regard to empowering family carers has not yet been sufficiently recognised within care-related policies</p>	<p>Y Lobby groups &amp; NGOs can play an important role in disseminating the benefits of ISTs to their members &amp; and in making the needs and requirements of their clientele visible to industry</p>	<p>Y Rapid ageing of European population will increase dependency ratios &amp; challenge</p>

**Policy Perspective**

Strengths	Weaknesses	Opportunities	Threats
<p>• Well developed healthcare insurance systems are in place in most EU countries offering a framework for concrete implementation of IST based solutions within this arena (e.g. regarding regulatory aspect, funding/re-imburement)</p>	<ul style="list-style-type: none"> <li>• The lack of obligatory design standards for accessible IST equipment/services hampers market presence of accessible products/services</li> </ul>	<p>sustainability of welfare states</p>	

# **Annex**

## **Tables presenting details from the policy analysis**

**Table 23 The main clusters of countries with general purpose IST policy/legislation**

<b>Information Society plan</b>	<b>e-Government policy</b>	<b>Telecoms liberalisation policy</b>	<b>Universal service/access policy</b>
Austria, Denmark, Finland, France, Germany, Italy, Ireland, Luxembourg, Netherlands, Portugal, Spain	Belgium, Finland, France, Germany, Ireland, Luxembourg, Netherlands, Portugal, Spain	Austria, Denmark, Finland, Italy, Ireland, Spain, UK	Denmark, Finland, France, Germany, Ireland, Spain
Japan & USA	Norway & Japan	Japan & USA	USA

*No information available for Greece, Sweden*

**Table 24 The main clusters of countries addressing older people in IST policy**

<b>Specific policy addressing the IST needs of older people</b>	<b>Older people addressed in general IST policy on ensuring access to &amp;/or learning ICTs</b>	<b>Older people addressed in general IST policy under 'the digital divide' topic</b>	<b>Older people addressed in e-Government policy</b>
Finland, Germany	France, Ireland, Italy, Netherlands, Portugal, Spain, UK	Austria, Belgium, Denmark	Luxembourg
USA			Norway

*No information available for Greece, Sweden*

**Table 25 The main clusters of countries addressing ICTs in general social inclusion policy**

<b>ICTs addressed in social care policy for older &amp;/or disabled people</b>	<b>ICTs addressed in Information Society policy under inclusive "for all citizens" topic</b>	<b>ICTs addressed in other social inclusion policy (lifelong learning, digital divide, employment)</b>	<b>No policy addressing social inclusion in the IS</b>
Belgium, Germany, UK	Denmark, France, Italy, Portugal, Spain	Austria, Finland, Ireland, Netherlands	Luxembourg
Japan & USA		Norway	

*No information available for Greece, Sweden*

**Table 26 The main clusters of countries addressing ICTs in policy empowering older people**

<b>Specific IST/ICT-related policy empowering older people</b>	<b>No specific ICT-related policy but ICT-based concrete measures /initiatives exist</b>	<b>No ICT-related policy empowering older people and no concrete measures</b>
Belgium, Finland, Germany	Denmark, Greece, Ireland, Italy, Luxembourg, Netherlands, Spain, UK	Austria, France, Portugal
USA	Japan & Norway	

*No information available for Sweden*

**Table 27 The main clusters of countries with pressure groups for older people**

<b>Lobby groups for older people</b>		<b>ICT applications as an issue for these pressure groups</b>	
	<b>Level of activity</b>		<b>Level of interest</b>
Austria	Very active	Austria	Important issue
Belgium	Very active	Belgium	Not an issue
Denmark	Very active	Denmark	Important issue
France	Very active	France	Not an issue
Finland	Very active	Finland	Marginal issue
Germany	Very active	Germany	Important issue
Greece	Very active	Greece	Marginal issue
Ireland	Very active	Ireland	Marginal issue
Italy	Very active	Italy	Marginal issue
Luxembourg	Marginal activity	Luxembourg	Not an issue
Netherlands	Very active	Netherlands	Important issue
Portugal	Not active	Portugal	Not an issue
Spain	Marginally active	Spain	Not an issue
UK	Very active	UK	Important issue
Japan	Marginally active	Japan	Not an issue
Norway	Very active	Norway	Important issue
USA	Very active	USA	Important issue

*No information available for Sweden*

**Table 28 The main clusters of countries addressing ICTs in general healthcare policy**

<b>Existing policy addressing ICTs in general healthcare policy</b>	<b>Recent policy addressing ICTs in general healthcare policy</b>	<b>ICTs not specifically addressed but ICT-based concrete measures /initiatives exist</b>	<b>Not addressed at all and no concrete measures</b>
Austria, Finland, Portugal	Denmark, Ireland, Netherlands, UK	Belgium, France, Germany, Italy, Luxembourg, Spain	
USA	Norway		Japan

*No information available for Greece, Sweden*

**Table 29 The main clusters of countries addressing ICTs in policy empowering family carers**

<b>Specific IST/ICT-related policy empowering family carers</b>	<b>No specific ICT-related policy but ICT potential recognised/ICT-based concrete measures /initiatives exist</b>	<b>No ICT-related policy empowering older people or family carers and no concrete measures</b>
Belgium, UK USA	Austria, Finland, Netherlands, Spain Japan & Norway	Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Portugal

*No information available for Sweden*

**Table 30 General structures of medical/care system and financing models in each country**

	<b>Overall model</b>	<b>Funding</b>
Austria	Mandatory comprehensive health insurance	Health insurance scheme is dominant model but there are also substantial private insurance contributions
Belgium	Compulsory health insurance for all major risks	Compulsory health insurance with significant state subsidy
Denmark	National health service mainly funded from general taxes	85% from general taxation with the remainder from co-payments
Finland	National health service with a shift of decision making from state to local level	Almost even balance between state and local taxation with some national insurance and some private payments
France	Compulsory health insurance covers almost all the population	Mostly statutory sickness funds but some direct payments
Germany	Numerous insurance funds and a significant private sector	Complex mixture of sources but only 21% from general taxation
Greece	Compulsory health insurance, national health service and a significant private sector	Private sector is substantial and there is a high degree of unofficial "additional payments"
Ireland	National health service and some co-payment insurance	Mainly general taxation with a small proportion from insurance
Italy	National health service based on compulsory health insurance	Mix of general taxation and compulsory contributions
Luxembourg	Compulsory health insurance	Mostly from the sickness funds with 27% from state subsidies
Netherlands	Complex system of public and private insurance but moving to a national scheme	Mostly from compulsory insurance schemes with some voluntary or private
Portugal	National health service based on compulsory health insurance	Main funding from national insurance scheme with a small private sector as well
Spain	Embryonic national health service; mix of general taxation and compulsory insurance	Dominated by general taxation but some compulsory insurance
Sweden	A comprehensive public sector health systems with strong local democratic control	Mainly local taxation supplemented by state funds and national insurance
UK	National health service mainly funded from taxation	Mainly general taxation with a small private sector.
Norway	National health service mainly funded from taxation	Entirely funded by general taxation
Japan	Compulsory health insurance	Universal medical care insurance system with nationally unified medical fees. Citizens subscribe to either: government managed, society managed or National Health Insurance
USA		

*Source: SeniorWatch and European Parliament, 1998*

**Table 31 The main clusters of countries as regards general healthcare financing models**

	<b>Predominant system of finance</b>	<b>Main supplementary system of finance</b>
Finland, Greece, Ireland, Italy, Norway, Sweden, Spain, UK	Public: Taxation	Private voluntary insurance, direct payments
Denmark, Portugal	Public: Taxation	Direct payments
Austria, Belgium, France, Germany, Japan, Luxembourg	Public: Compulsory social insurance	Private voluntary insurance, direct payments, public taxation
Netherlands	Mixed compulsory insurance and private voluntary insurance	Public taxation, direct payments

Source: SeniorWatch and European Parliament 1998

**Table 32 General structures of homecare systems and financing models in each country**

	<b>Main players providing homecare (% if available)</b>	<b>Funding (% If available)</b>
Austria	Mainly provided by family carers (70%) followed by non-profit organisations (36%) but very little from local municipalities (4%)	Mainly tax-based funding
Belgium	Mainly family carers supported by professional help	Mainly tax-based financing (81%) supplemented by out of pocket (14%) and private insurance (5%)
Denmark	Completely provided by municipalities (100%)	Completely tax-based financing (100%)
Finland	Mainly municipalities (68%) followed by non-profit organisations (25%) with some homecare privately paid for (7%)-(family carers not known)	Mainly tax-based funding (84%) with some out-of-pocket (16%)
France	Mainly provided by family carers (79%) supplemented by care from municipalities (21%)	Completely out-of-pocket
Germany	Mainly family carers (51%) followed by non-profit organisations (31%) with some homecare privately paid for (17%) but very little from local municipalities (1%)	Mainly insurance-based funding
Greece	Mainly family carers (93%) and a mix of private (5%) and non-profit (3%) organisations	Completely out-of-pocket (100%)
Ireland	Mainly family carers supported by municipalities	Mainly out-of-pocket with some tax-based funding
Italy	Mainly the private sector (80%) with remainder provided by municipalities (20%)	Mainly out-of-pocket (80%) with some tax-based funding (20%)
Luxembourg	Not available	Mainly insurance based with some means tested tax-based funding
Netherlands	Mainly family carers (75%) followed by non-profit organisations (24%) with very little homecare privately paid for (1%)	Mainly tax-based (94%) with some small out-of-pocket funding (6%)
Portugal	Mostly family carers supported by non-profit organisations, however, the private homecare market is on the increase	Mainly tax-based funding (80%)
Spain	Mainly family carers (83%) supported by municipalities (2%) with some homecare privately paid for (5%) or coming from other sources (7%). Involvement of non-profit organisations is unknown	Mainly out-of-pocket with small private insurance sector
UK <sup>143</sup>	Mainly municipalities (49%) with a significant private market (34%) with the remainder provided by non-profit organisations (17%)	Mainly tax-based funding (82%) with some out-of-pocket (18%) and small private insurance sector

<sup>143</sup> Note that market share estimates refer specifically to homecare services funded by local authorities and do not include NHS services, privately purchased homecare or care provided by family carers - estimated 5.7 million unpaid family carers in the UK.

Japan	Mainly non-profit organisations (64%) with a significant private sector (31%) but very little from local municipalities (51%)	Divided equally between tax-based and social insurance funding (50:50)
Norway	Predominantly municipalities (98%) with the remainder provided by family carers (2%), however private care is increasing	Mainly tax-based funding (98%)
USA	Private sector is main player (81%) with remainder provided by municipalities and non-profit organisations (19%). (% Family carers not known but a growing segment)	Mainly tax-based funding (60%) and supplemented by out-of-pocket (27%) and small private sector insurance (8%) and other private funds (5%)

*No information available for Sweden*

**Table 33 The main clusters of countries regarding homecare providers**

Family carers	Municipalities	Private sector	Non-profit organisations
Austria, Belgium, France, Germany, Greece, Ireland, Netherlands, Portugal, Spain	Denmark, Finland, UK	Italy	
	Norway	USA	Japan

*(No information available for Sweden)*

**Table 34 The main clusters of countries regarding homecare financing models**

	Predominant funding model	Main supplementary system of finance
Denmark	Entirely tax-based	
Austria, Belgium, Finland, Netherlands, Portugal, UK	Mainly tax-based	Private insurance, out-of-pocket
Norway, USA		
France, Greece	Entirely out-of-pocket	
Ireland, Italy, Spain	Mainly out-of-pocket	Private insurance, tax-based
Germany, Luxembourg	Mainly insurance based	Tax-based
Japan	Equally divided between tax-based and social insurance	

*No information available for Sweden*

Table 35 Maturity of the current telecare market

	Active alarm services	Passive alarm service	Remote support of mobile care staff	Remote support of family carers	Advanced services using video	Other
Austria	Available	Available	Available	Not available	Not available	
Belgium	Available	Available	Not available	Not available	Experimental	
Denmark	Widely used (100%)	Widely used (100%)	Widely used (100%)	Emerging	Experimental	
Finland	Widely used (100%)	Emerging	Emerging	No information	Emerging	
France	Medium maturity	Low maturity	Marginal maturity	Marginal maturity	Not available	
Germany	Available but only partially used	No information	Emerging	Emerging	No information	
Ireland	Available but only partially used	Emerging	Not at all in use	Not at all in use	Experimental	Experimental smart homes
Italy	Routinely used in a small number of areas	Usually offered in conjunction with active alarms	Almost not at all used	Almost not at all used	Experimental	
Luxembourg	Widely available and widely used (across the whole country)	No information	No information	No information	No information	
Netherlands	Widely used (80-95%)	Experimental (0-5%)	Partially used in experimental context (5-10%)	Partially used in experimental context (5%)	Experimental	Experimental smart homes & domotica
Portugal	Partially used	Partially used	Emerging	Emerging	Emerging	
Spain	Widely used	Early stages of market introduction	Early stages of market introduction	Experimental phase	Experimental phase	Experimental GPS systems
UK	Widely used	Partially used	Partially used	Partially used	Experimental	Experimental - smart homes & telemedicine
Japan	Widely available only partially used but growth expected	Widely available only partially used but growth expected	Partially used	Partially used	Various experimental uses being tested	
Norway	Widely used (available in 97% of municipalities)	Partially used but increasing interest	Emerging	Emerging	Emerging – mainly telemedicine	Smart house installations widely used Telemedicine emerging
USA	Widely used	Only partially used because of extra costs over active services	Partially used but growing rapidly	Low levels of usage but concept is growing rapidly	Partially used	Telemedicine is growing rapidly

(No information available for Greece, Sweden)

**Table 36 The main clusters of countries with financial provision for ICTs to support homecare (e.g. telecare services)**

Country	Funding models
Denmark	ICTs provided free. No distinction made between AT and ICTs.
Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal	Some funding available for selective ICT-based services, e.g. passive/tele-alarms (and also for smart home technology in Norway)
Japan, Norway	
Austria, Finland, UK	Some limited funding available for ICT-based homecare devices but subject to needs assessment
USA	
Spain	No funding available for ICT-based homecare services; only for assistive technologies
Japan	
Luxembourg	No funding available for ICT-based homecare devices or services; only available at institutional level

*No information available for Greece, Sweden*

**Table 37 The main clusters of countries with anti-discrimination policy**

Anti-discrimination legislation exists that promotes ICT	ICTs addressed in other general integration policies	Some ICT-based concrete measures /initiatives	ICTs not addressed in anti-discrimination strategies or integration policies
Denmark, UK	Finland, France, Germany, Ireland, Italy	Netherlands, Spain	Austria, Belgium Luxembourg, Portugal
USA	Norway, Japan		

*No information available for Greece, Sweden*

**Table 38 The main cluster of countries with 'design-for-all' policy**

No specific policy but guidelines exist	No specific policy but covered in other policy areas (e.g. e-Government)	No specific policy but some concrete measures /initiatives
Finland, Netherlands	Austria, Denmark, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Portugal	Belgium, Spain, UK
Japan & USA	Norway	

*No information available for Greece, Sweden*

Table 39 The main cluster of countries with public procurement policy

Explicit policy/guidelines exist	No explicit policy but some activity in this area	No policy or guidelines
Denmark, France, Germany, Ireland, Italy, Spain		Austria, Belgium, Finland, Netherlands, Portugal, UK
Norway, USA	Japan	

*No information available for Greece, Luxembourg, Sweden*

Table 40 Assistive technology service delivery processes

Clearly defined process	No clearly defined process
Belgium, Denmark, Finland, Germany, Ireland, Italy, Netherlands, UK	Austria, France, Portugal, Spain
Norway & USA	Japan

*No information available for Greece, Luxembourg, Sweden*

Table 41 Availability of ICT-based assistive technology services

	active alarm service	e-newspapers /books	TV captioning	text telephony & relay	Other
Austria	ü	ü	ü	ü	--
Belgium	ü	--	?	ü	--
Denmark	ü	ü	ü	ü	Passive alarm services
Finland	ü	ü	ü	ü	--
France	ü	ü	ü	ü	the Minitel
Germany	ü	ü	ü	?	--
Ireland	ü	--	ü	ü	--
Italy	ü	ü	ü	ü	--
Luxembourg	ü	ü	--	--	--
Netherlands	ü	--	ü	ü	some telecare services
Portugal	ü	--	ü	ü	--
Spain	ü	--	ü	ü	tele-assistance service
UK	ü	--	ü	ü	public text payphones
Japan	ü	--	?	?	Passive alarm services, telecare, health monitoring
Norway	ü	--	ü	ü	Passive alarm services
USA	ü	ü	ü	ü	audio TV description

*No information available for Greece, Sweden*

**Table 42 The main clusters of countries with financial support for ICT equipment**

<b>Direct and indirect financial support for ICT equipment available</b>	<b>Some funding available on case-by-case assessment/or individual application</b>	<b>No support for ICT equipment</b>
Belgium, Denmark, Ireland, Italy, Netherlands, Portugal, UK Norway	Austria, Finland, France, Germany, Spain	Luxembourg  Japan, USA

*No information available for Greece, Sweden*

**Table 43 The main clusters of countries with eligibility factors for financial support for ICTs**

<b>Financial support based on medical need/income (principle of subsidiarity)</b>	<b>Other factors</b>
Austria, Denmark, France, Italy, Netherlands, Portugal Norway, USA	Belgium, Germany, Finland, Ireland, UK Japan

*No information available for Greece, Luxembourg, Sweden*

**Table 44 The main clusters of countries with ICT-related R&D policy**

<b>Specific IST/ICT R&amp;D policy</b>	<b>No specific policy but increased activity in this area</b>	<b>No specific policy and no significant activity in this area</b>
Denmark, Germany, Greece, France, Spain, UK USA	Austria, Belgium, Finland, Italy, Luxembourg, Netherlands Japan, Norway	Ireland, Portugal

*No information available for Sweden*