

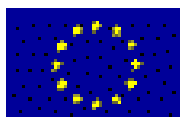
# **Various Studies on Policy Implications of Demographic Changes in National and Community Policies**

## **LOT 7**

### **The Demographic Change – Impacts of New Technologies and Information Society**

#### **Executive Summary**

**November 2005**



**European Commission**  
**EMPLOYMENT AND SOCIAL AFFAIRS DG**  
Social protection and social integration  
Social and demography analysis

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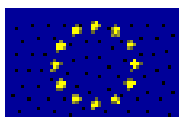
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Bonn, November 2005



**European Commission**  
**EMPLOYMENT AND SOCIAL AFFAIRS DG**  
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# Part A

## Key Conclusions and Recommendations

## Key conclusions and policy recommendations

This section of the overall report presents the key conclusions and policy recommendations from a study of the interactions between two major forces of change in Europe – demographic ageing and the increasing pervasiveness of Information and Communication Technologies (ICTs).

In 2005 we are at a stage where ageing of the European population is already underway and will soon start to accelerate. In the meantime the deployment of computers, the Internet and mobile communications in all aspects of the economy, services and everyday life continues apace. These two trends can hardly pass each other by without interacting in a multitude of ways. The challenge for Europe is to identify the key developments and points of intersection, the opportunities and risks that these present and the levers of influence whereby policy can help to shape developments in desired directions.

The study aimed to provide support to this policy challenge by focusing on three core themes:

- An age-friendly Information Society
- ICTs, employment and work
- ICTs to support independent living, social care and health care.

On the basis of the evidence and analysis presented in the report it can be concluded that ICTs and the emergence of the Information Society present both challenges and opportunities in the context of the demographic ageing of the European population. Market forces alone will not ensure that the outcomes from the intersections between demographic ageing and ICT developments will be optimal for older people and for European society as a whole. Public policy will be required that helps to shape developments in the ways that are needed to exploit the positive potential and reduce the likelihood of negative impacts.

## Towards an Age-friendly Information Society

### What the evidence shows

Despite the fact that Internet usage among older age groups has gradually increased during recent years, only a minority of older people are actively engaging in the Information Society today and this age-divide should be a matter of real concern to policy. It means that older people are not gaining the benefits of online services and applications that have high potential utility for them and are also facing new risks because important services are increasingly *only* available online. The available evidence indicates that these age-divides will not go away without policy intervention - the majority of the current cohorts of older people aged 65 years and older are unlikely to go online on their own initiative within their lifetimes and, as technology continues to evolve, new age-divides will emerge for future cohorts of older people.

For these reasons it is important that reinforced policy attention is given to reducing the age-divides in engagement in the Information Society but also that much more attention is given to counteracting the potential negative impacts of such divides. It is neither appropriate nor realistic to try to push all older people online, so substantial efforts will be needed to ensure that those who are not online are not left behind in access to services and to wider civic participation.

## Priority actions

The EU and Member States must give a lot more attention to the age-divide in the Information Society. Two priority actions are proposed.

### 1. Establish an EU Task Force to tackle the age-divide in the Information Society

A specific EU Task Force should be established to address this issue, which could be one of the flagship initiatives under the eInclusion strategies to be developed and implemented through the i2010 programme. Its brief could be to establish targets for a substantial reduction of age-divides in the Information Society in Europe and of the impacts of such age-divides in everyday life. Both near-term (2010 horizon) and longer-term targets could be established. The brief could also include the identification of the actions needed to achieve the established targets and the monitoring mechanisms needed to assess progress towards their achievement. The Task Force could include representatives from national and local government, older people's organisations, the relevant branches of the ICT industry and others active in the promotion of eInclusion in Europe.

### 2. Address older people's needs in all European eGovernment initiatives

There is considerable EU level activity and co-operation between Member States in the development and deployment of eGovernment services. This provides an ideal opportunity to initiate a Europe-wide effort to address older people's needs in relation to a wide array of services of key public interest. It should become a matter of policy that all eGovernment programmes give a high priority to meeting the needs of older people. This will require attention both to the needs of (the minority) of older people who are online and of the (majority of) older people who are not online. The objectives should be to ensure that older people also get the benefits of new approaches to public service provision and that eGovernment developments are associated with an enhancement rather than a reduction in the levels of service that older people have received up to now.

## ICTs, Employment and Work

### What the evidence shows

The available evidence suggests that ICTs present both risks and opportunities for the achievement of the European goals of higher employment rates and good quality of work for people in the later stages (50-64 years) of the working age range. An increasing proportion of jobs require use of ICTs and these are often better quality jobs. More opportunities for older workers and potential workers to access jobs involving ICTs could therefore make a substantial contribution to the achievement of the EU targets. Without policy intervention, however, access to such jobs will remain restricted mainly to older workers who are already in advantaged positions - those who are better educated and who have good quality and well-remunerated jobs already. The policy response must therefore give particular attention to equality of opportunity and to ways of creating the conditions whereby older workers (and

potential workers) facing less advantageous circumstances can be enabled to benefit from ICTs in the workplace.

Equality considerations are also central in relation to the design of mainstream ICTs that are used in the workplace and to the provision of technologies in the workplace that are specifically developed to support older workers with disabilities (assistive technology). ICTs currently available in the workplace can be difficult to use for many older workers and exploitation of the opportunities presented by assistive technologies is very uneven across Europe.

### **Priority actions**

The EU, Member States and other relevant stakeholders must give a lot more attention to the contribution of ICT skills, age-friendly ICT design and assistive technologies to the employment opportunities and work capacities of older workers. Two priority actions are proposed.

#### **3. Give all older Europeans (50-64 years) a suitable opportunity to acquire ICT skills**

A target to give all older Europeans (50-64 years) a suitable opportunity to acquire ICT skills should be included in the EU Employment Guidelines in order to support the achievement of the Stockholm and Barcelona Council employment targets. This would also make a major contribution towards the reduction of Information Society age-divides for those aged 65+ in the future. Employers, public and private training providers and other relevant actors should be mobilised to ensure that suitable training opportunities are made available within and outside the workplace. Public subsidies should be provided, where necessary, to ensure equality of opportunity for those who would otherwise be unlikely to be reached.

#### **4. Exploit the provisions in the EU Equality and Public Procurement Directives**

The *European Council Directive Establishing a General Framework for Equal Treatment in Employment and Occupation* has provisions under the age and disability grounds that, in principle, require the availability of accessible and usable ICTs and / or assistive technologies for older workers (and potential workers) that need them. The ICT-related implications of the age and disability grounds need to be spelled out (perhaps in a Communication from the Commission) and robustly implemented. Because the public sector plays a major role as employer, this should also draw out the links between the Equality Directive and the provisions under the European *Public Procurement Directives*. An EU-driven initiative could follow, to engage the relevant stakeholders (government equality agencies, employers, procurers, trades unions, user organisations, and the ICT and assistive technology industries), establish targets and put in place an EU-wide programme of action (e.g. within an Open Method of Coordination framework) to achieve the targets.

## Independent living, social care and health care

### What the evidence shows

The evidence shows that ICTs offer a very large but unrealised potential to address the care challenges posed by demographic ageing. Solutions are becoming available that can support independent living, including assistive technologies for everyday life and ICT-supported delivery of social care and health care services in the home and community. Both financial and non-financial benefits can be gained from wider utilisation of such solutions. However, the innovation processes that are needed to bring these technological developments through from RTD to widespread take-up and deployment (by health and social care services and by older consumers themselves) are not functioning effectively at present. There is also very uneven provision of basic infrastructures for delivering services to the home, such as social alarm centres, across Europe - in some countries social alarm infrastructures have been established as a key element of social care for older people but in others are hardly available at all. The current EU-wide market potential for state-of-the-art social alarm services is estimated to comprise 21 million potential users, but only a comparatively small proportion of these are actually served today. Similar demand potentials exist in relation to emerging ICT-supported care solutions that have been implemented only in small scale pilots as of yet. Many of these show considerable promise but we still have very limited understanding of their wider cost-benefit, social and ethical dimensions.

### Priority actions

EU-driven actions are needed to encourage the necessary developments in this field. Two priority actions are proposed.

#### **5. Use the Structural Funds to co-finance ICT-supported social care infrastructure**

Telephone-based social alarm services should now be considered a standard component of the social care infrastructure for older people in Europe and a quality service should be available to all older Europeans who need one. The development or improvement of social alarm infrastructure should therefore be specifically identified as an eligible measure for co-financing under the EU structural funds. Depending on the circumstances, the development of such infrastructures might include capital funding for the technological and facilities components (call centres, networks and user alarm equipment) and human resources funding for training, organisational development and so on. Apart from providing basic but essential day-to-day support for older people, the availability of such an infrastructure is a prerequisite for many of the service innovations that are now becoming possible through emerging technologies such as those in the ambient assisted living field.

#### **6. Substantially increase support for RTD and trials of emerging technologies**

The EU and Member States should provide substantially increased support for RTD and trials of emerging technologies to support independent living, social care and health care in the home and community. Funding for RTD, including related socio-economic research, in this field should be significantly increased under FP7. Other instruments, such as eTEN,

should also be maximally leveraged to support the large-scale, real-world trials that are now needed to prove promising emerging technologies and to assess cost-benefit, social and ethical aspects.



# Part B

# Summary Report

## Summary Report

This part of the overall report summarises the outcomes of a detailed analysis of the interactions between two major forces of change in Europe – demographic ageing and the increasing pervasiveness of Information and Communication Technologies (ICTs).

In 2005 we are at a stage where ageing of the European population is already underway and will soon start to accelerate. In the meantime the deployment of computers, the Internet and mobile communications in all aspects of the economy, services and everyday life continues apace. These two trends can hardly pass each other by without interacting in a multitude of ways. The challenge for Europe is to identify the key developments and points of intersection, the opportunities and risks that these present and the levers of influence whereby policy can help to shape developments in desired directions.

The study aimed to provide support to this policy challenge by focusing on three core themes:

- An age-friendly Information Society
- ICTs, employment and work
- ICTs to support independent living and care.

This document presents a summary of the report structured according to the these three themes. It summarises the main findings and conclusions and presents the recommendations for policy that have been formulated on the basis of these.

### Theme I - An age-friendly Information Society

The first theme concerns the intersection of demographic ageing with the emergence of an Information Society. The focus is on ICTs in everyday life and how these are impacting on the ways that everyday things are done and the everyday things that are done. Some central questions are addressed. Are older people getting involved or being left behind in the Information Society? Does this really matter for them or for society overall? How might things evolve without any policy intervention? Do market and business interests coincide with consumer and social concerns? What policy interventions might be warranted to achieve desired outcomes?

### Challenges and opportunities

The analysis of the available evidence identifies a number of challenges and opportunities in relation to this theme.

#### Challenges and opportunities

- A prevailing age-divide as regards engagement in the Information Society.
- Various barriers and constraints that affect older people's engagement.
- Real potential benefits for older people, but the majority are missing out.
- Emergence of new risks for older people.

## Prevailing age divides

Although ICT uptake among older citizens in the EU25 has steadily increased during recent years, they are still much less likely to have access to and use ICTs and online services than younger people and an age-divide will continue for the foreseeable future.

### Age divides

- Just over one-in-four of those aged 55-64 and just under one-in-nine of those aged 65-74 use the Internet, compared to almost two-thirds of those aged 25-34 and almost half of those aged 35-54.
- Those older people who are online are a lot less likely to have broadband access.
- Available evidence suggests that the current age-divide will not disappear in the foreseeable future without significant supply-side and demand-side initiatives.
- In addition, continuing changes in technology and in the ways that technology is used may open up new divides in the future.

## Barriers and constraints

The older people who do utilise ICTs and the Internet tend to be the younger and better-educated, to have more active lifestyles and to be better-off financially. There are also a number of specific factors that pose barriers to and constraints on the engagement of older people with ICTs and the Information Society.

### Barriers and constraints

#### *Lack of interest*

- Many studies have confirmed that lack of interest and low motivation are key factors limiting engagement in the Information Society by older people.
- Computer anxiety and intimidation by technology also appear to be barriers, compounded by the fast pace of hardware and software development.

#### *Lack of skills*

- Another factor is lack of skills in how to access and use the Internet and associated access devices such as PCs.
- In addition, many older adults who are actually online report a lack of confidence in their online skills and this can limit what they do online and the benefits that they get.
- Not having had the opportunity to acquire ICT skills in working life is a major factor behind these age-divides in skills.

#### *Costs*

- Costs can also be an important barrier for older people on low incomes, a factor that is especially relevant in the new Member States.
- More generally, the tendency towards greater cost-sensitivity amongst older people is also a factor.

#### *Age-related functional restrictions*

- A large proportion of older adults (perhaps 60%) have functional restrictions (e.g. visual, hearing and dexterity) that prevent or hinder their usage of ICTs as currently designed.

## Real potential benefits (being missed by older people)

The age-divide would hardly matter very much if the Information Society had little or no practical relevance for the lives of older people. However, as the Information Society matures it is clear that there are many real benefits that are being missed by those who are not online.

### Real potential benefits (but being missed by most older people)

#### *Doing things from home*

- The opportunity to do things online from home has particular utility potential for older people who experience mobility restrictions, for example, because of physical disability, increased frailty or fears about crime in the neighbourhood or beyond.
- Very practical benefits can be achieved in everyday life through online shopping, online banking and online interaction with public administrations.

#### *Access to health information*

- Online health information has now become a central feature in the health management activities of very many European citizens.
- The age-divide is resulting in new (e)health divides, with those who stand to benefit most (the older age groups with high prevalence of chronic and other health conditions) making much less use of the online opportunities.

#### *Consumer empowerment*

- More generally, information of practical usefulness in everyday life is increasingly becoming available over the Internet.
- One of the most common uses is searching for and comparing (consumer) information about products and services; older people are a lot less likely to do this and miss out on the consumer empowering benefits of being able to source cheaper and better products.

## New risks

Apart from missing out on the potential benefits presented by the Information Society, some new and more direct risks for older people can also be identified.

### New risks

#### *Discrimination (through inaccessible products and services)*

- Many older people are prevented from using ICTs because lack of attention to their accessibility and usability requirements; this may increasingly be considered to be a manifestation of discrimination, given that there are readily available design solutions for many of the problems.

#### *Increasing number of services only available online*

- An increasing number and range of both commercial and public services are now only available online, or are available off-line only at a lower quality or higher price, putting older people at a serious disadvantage.

#### *Loneliness*

- Increasing virtualisation of social contacts and other everyday interactions brings the risk of social isolation and loneliness for older people; however, the research evidence available on the social impacts of this nature is quite limited to date.

## Market failure and the need for remedial public policy

The age-divide in engagement in the Information Society and the accessibility and other barriers faced by older people indicate significant market failures. This applies both to the ICT industry and to commercial and public online service providers. There is a need for intervention through remedial public policy.

### Current European and Member State policies and measures

The main current EU-level and Member State policies and activities relating to the Information Society age-divide can be found under the *eInclusion* and *eAccessibility* themes. These are addressing, in various ways, three main themes: awareness, motivation and skill; access and affordability; and accessibility and design for all.

#### Current European and Member State approaches

##### *Awareness, motivation and skills*

- There is a lot of activity across Europe focusing on raising Internet and Information Society awareness, motivation and skills amongst older people; measures at a variety of different levels of action (government, local, and NGO) can be identified.
- There is considerable variety of initiatives and approaches, in part reflecting tailoring to local needs and circumstances but in part reflecting widely varying levels of attention and resource allocation to the issue across countries, regions and localities.

##### *Access and affordability*

- Issues of access and affordability of the Internet for older people are also being addressed, although to a considerably lesser degree.
- Driven in part by the eEurope initiative, most Member States (particularly the New Member States) have implemented significant initiatives to install *Public Internet Access Points (PIAPs)*, although there are relatively few examples of initiatives targeted specifically towards older people.
- The available evidence suggests that older people are a lot less likely to use PIAPs than younger people so other types of interventions are also needed; more generally, although public access points can play an important role, the real convenience benefits of the Internet especially derive from personal access at home, particularly for those who do not have workplace access.
- Some Member States, sectoral interests and ICT suppliers have implemented *specific financial measures* to help overcome cost barriers to access to ICTs and the Internet, including discounted prices, direct subsidies, financial incentives to taxpayers and financial incentives to employers.
- Many of these measures are, by their nature, not very relevant for older people who are not in employment or for whom tax relief may not be relevant. Therefore, although these types of measures should be examined for their potential contribution to reducing cost barriers for older people, the most effective lines of action may be within the wider reach of more universal provisions.
- So far there has been little examination of how more universal mechanisms, such as the *Universal Service Obligation* imposed in the EU's telecommunications market and *social protection* systems, could be used to reduce costs barriers to Internet access for older people.

**Current European and Member State approaches (continued)**

*Accessibility and Design for All*

- The eAccessibility policy situation in Europe and internationally represents something of a patchwork at the moment, with different issues being addressed in different countries as well as different policy approaches being employed to address similar issues across countries.
- This is an area where the international dimension is important, not least because of the global marketplace for ICTs and the global implications of accessibility requirements in public procurements whether in Europe, the US or elsewhere. In this regard, eAccessibility is a topic in the EU-US dialogue processes.
- Various EU instruments and policies directly or indirectly address eAccessibility, including the Communication on eAccessibility in 2005; Council Resolutions on accessibility of public websites and on eAccessibility more generally; the Public Procurement Directives; the Copyright Directive; the Universal Service Directives; the Terminals Directive and the Framework Directive on Employment Equality.
- So far, however, the extent to which the potential offered by these instruments in relation to eAccessibility is not very much exploited in the Member States - accessibility of public (and private) web sites is still poor, very few ICT procurements include accessibility requirements, and eAccessibility does not seem to have emerged as a theme in response to the Employment Equality legislation.
- The broader Design for All approach has been supported at the EU-level through help with the establishment of the European Design for All Network (EDeAN); however, research suggests that a lot of awareness raising will be required if Design for All is to become mainstreamed amongst ICT designers.

**Policy and research priorities**

Given the current market failures and the challenges that are posed by the age-divide and other age-relevant developments in the Information Society, a number of policy and research priorities can be identified.

**Policy and research priorities**

*Awareness, motivation and training*

- An EU driven effort to collate and exchange good practice, benchmark developments and set common targets for numbers of older people reached; this could be initiated within the framework of the EQUAL programme.
- Research on learning preferences and needs of older people in relation to ICT skills.

*Access and affordability*

- A review and re-examination of the possibility of extending the scope of universal service provisions to include mobile and Internet access.
- Socio-economic research on the importance of the Internet for accessing essential services and of cost barriers for older people in this regard.

**Policy and research priorities (continued)***Accessibility and Design for All*

- Development of a comprehensive, multi-pronged EU level approach, with prominent attention to the needs of older people.
- An EU initiative to encourage and give guidance for strong implementation by the Member States of the accessibility provisions of the various EU Directives; to include encouragement of specific attention to age-friendly design of ICTs.
- Continued EU emphasis and encouragement of the Design for All approach to address the diversity of user needs, with special attention to changing needs as people get older; EDeAN work on curriculum development to give prominent attention to the needs of older people.
- Increased research attention to understanding age-related changes in perception, dexterity and cognition and the implications of this for ICT design; specific targeting of this issue in the RTD Framework Programmes.

*Counteracting second-order digital divides*

- An increased EU emphasis on second-order skills to make the best use of the Internet in areas of key public interest, with prominent attention to older people
- Socio-economic research on the benefits of the Internet (and dis-benefits of not using it) for older people, the skills needed, and monitoring of skills gaps.

*Avoiding new risks from virtualisation*

- Promotion amongst the Member States of the importance of access for all (especially for older people), including those not online, to services of public interest.
- Establishment of common benchmarks on the quality of social interactions as a key indicator of social cohesion and social capital in the Information Society.
- Socio-economic research to monitor the impacts of increasing virtualisation on access to services of public interest and on social interaction / isolation.

*Supporting the development of older people's interest groups*

- Encouragement of attention to ICT and Information Society issues for older people, both by older people's interest groups and by more general consumer organisations.
- Socio-economic research on the role and potential influence of consumer and other interest groups in this area.

## Theme II - ICT, employment and work

The second theme focuses on the intersection of demographic ageing with the increasing utilisation of ICTs in the workplace. Key features of current and future demographic change in this area include ageing of the workforce and a policy to encourage increased employment rates for older workers and to discourage early retirement. In 2004, the employment rate amongst the 55-64 years age group in the EU25 was 40.7%, well below the target of at least 50% that was set at the Stockholm European Council in 2001. Achievement of these targets will require the mobilisation of all possible sources of encouragement for older workers as well as removal of causes of discouragement.

The analysis on this theme of ICTs and "work-related active ageing" focuses on some critical issues for European employment policy. What are the opportunities and risks posed by ICTs for the achievement of high employment rates? Do they support better or worse quality of work and work-related health and wellbeing for older workers? What are the implications for work-life balance and informal work such as family care? What impacts do they have on age equality in the workplace and in the labour market? What can policy do to shape developments in a way that maximises the potential benefits and minimises the potential negatives?

### **Older workers' exposure to ICTs and technological change**

Ageing of the workforce (and potential workforce) is occurring against a backdrop of continual technological change, the most dramatic of which in recent times has been the wide-scale introduction of ICTs into working life. Available evidence indicates the increasing exposure of older workers to technological change as well as some differences between older men and older women and between younger and older age groups in this regard.

#### **Exposure to ICTs**

- Older workers are proportionately represented amongst occupations where ICTs have a high relevance, although they are significantly under-represented in the specialist ICT areas.
- Workers in the youngest and oldest age ranges are somewhat less likely to use ICTs at work than prime age workers; for the older workers, a fall off in usage can be detected amongst those aged 55 years and above, especially amongst those aged 60 and above.
- Nevertheless, substantial numbers of older workers work with ICTs to some degree; more than half of workers aged 50 to 54 years use computers in their work, as do more than one-third of workers aged 55 to 59, and about one in five workers aged 60 years and older.
- Amongst older workers, men are more likely than women to use computers in their work and, overall, men comprise about two-thirds of the older workers using computers.
- Looking forward to 2010, it can be expected that, if nothing else changes and computer users show the same pattern of remaining in or exiting from the workforce as other workers, then older workers will have the same level of computer usage as prime age workers have now.

## **Challenges and opportunities presented by ICTs**

The possible interactions between ICTs and demographic ageing are complex and multi-dimensional and simple direct effects of ICTs on employment rates and employment-related outcomes for older workers and potential workers are hard to isolate. An added difficulty in this is that there has been relatively little focused research on ICTs and work-related active ageing.

### **Quality of work and work-life balance**

Overall, the available evidence suggests that jobs involving computer usage are more likely to be of good quality (and thus to be "age-friendly") than are jobs that do not, although ICTs can bring intensification to some jobs in a manner that is unlikely to suit the capacities and preferences of many older workers.



### Quality of work and work-life balance

#### *Work quality*

- Jobs involving computer usage are more likely to be of good quality (and thus to be "age-friendly") than are jobs that do not.
- One reason for this is that computers tend to be used in jobs that were of better quality in the first place; in addition, however, there is evidence that when care is taken to prepare properly for the introduction of ICTs they are more often associated with improvements than with dis-improvements in the quality of work.
- Amongst computer users, older workers have a higher likelihood of being in better quality jobs than younger workers, although a significant minority are in low quality jobs that may either be under-stimulating or involve excessive demands.
- More generally, there has been an intensification of work associated with increasing usage of ICTs over the last 10 to 15 years, with a growth in the number of workers being required to work at high speeds and meet tight deadlines; some workers may view this as a positive quality of their jobs but others (especially older workers) may not.
- In fact, it seems that older workers working with computers are overall more likely to have to work at high speeds and meet tight deadlines than older workers in other jobs, although there is substantial variability within both groups.

#### *Work-life balance*

- Teleworking and other applications of ICTs open up opportunities for more flexibility that could be used to facilitate work-life balance; however, we still know relatively little about how attractive or practically useful teleworking from home might be for older workers in particular circumstances, for example, those with care responsibilities.

### Workability and productivity

The available evidence indicates that older workers are quite capable of learning to use ICTs if given the opportunity and a large majority of those who work with computers feel that they have sufficient skills for this work. Jobs involving ICTs are more often of a quality that supports the maintenance of workability and productivity of older workers, although this may not always be the case when ICTs are associated with intensification of work. Accessibility and usability of ICTs, and the availability of assistive technology, are important for the maintenance of workability and productivity of many older workers but these aspects have not been given sufficient attention to date.

### Workability and productivity

#### *Skills*

- Overall, only about one-half of the EU15 workforce working with computers has ever received computer training at the workplace; computer users aged 60 and over and those aged under 30 are less likely to have received computer training at the workplace than other age groups.
- Nevertheless, most older workers working with computers say that they have sufficient skills to meet the demands of their work; about 10% say that their skills are too low.
- Research indicates that older workers are well able to learn and apply new technologies but are generally slower than younger adults to acquire new skills and require more help and hands-on practice.

### Workability and productivity (continued)

#### *Age-friendly design of ICT-based work*

- The issue of age-friendly design of work, whether ICT-based or otherwise, has received insufficient attention to date, both in research and in practice.
- Given that the majority of jobs involving ICTs seem to be of relatively good quality, ICTs may often be conducive to the maintenance of workability and productivity of older workers; however, trends such as intensification may have negative implications for workability of older workers.
- An issue that warrants more attention is the prevalence of repetitive strain injuries amongst those working with ICTs; there is a lack of good quality data on this topic for the European workforce and research is needed on whether the risks and requirements (for ergonomic adjustments) are especially pronounced for older workers.

#### *Accessibility and usability ICTs*

- Although generally the overall work quality in jobs involving ICTs tends to be relatively high, the specific physical and cognitive demands of working with ICTs such as computers can pose substantial challenges for many older workers.
- There are significant age-related changes in physical and cognitive function that can affect the accessibility and usability of ICTs for older workers; European and US research suggests that up to 60% of those in the 50-64 years age range may face challenges in this area.
- Although about one-in-five computer users at work in the EU are aged 50 and above, very little attention has so far been given to this issue in Europe, whether by employers (in their purchasing of ICTs) or by the ICT industry (in the design and marketing of ICTs).

#### *Assistive technology*

- Assistive technologies, ranging from low- to high-tech devices and systems, can help both to make ICTs more accessible and to provide supports for workers with physical or cognitive challenges in the wider aspects of their jobs.
- Available evidence indicates that there are wide variations across Europe in the extent of provision of assistive technologies and that this is generally a very underdeveloped area.

## Employability

Employability concerns the factors that affect an older (potential) worker's likelihood of getting a job in the labour market and the type of job they get (for those trying to enter the workforce), as well as opportunities to change jobs (for those already in the workforce). Technological change may have implications for employability, for example, through changes in skills and in the cost-productivity ratios of workers of different ages, skill profiles and so on. It may also have impacts through differential usage of new ICT-based supports for skill development (e.g. eLearning) and job seeking (e.g. online job search).

### Employability

#### *ICT skills for general employability*

- Although ICT skills are increasingly required by employers for a wide range of jobs, there is little direct evidence on how ICT skills (or lack of same) affect the employability of older workers.
- ICT skill levels are dramatically lower amongst those aged 50-64 who are outside the labour market in comparison to their peers who are in the workforce and also in comparison to younger people, whether inside or outside the workforce; this will increasingly put older potential workers at a disadvantage in seeking (to return to) work.

#### *Employability in IT occupations*

- The IT workforce is younger than that of other occupations comprising workers of comparable educational attainment.
- US research indicates that older IT workers (aged 40 and over) are more likely to lose their jobs than younger workers whereas the reverse is the case in the rest of the economy.

#### *Use of ICTs to support skill acquisition*

- European research shows that those aged 50-64 are much less likely than other age groups to make use of the Internet for purposeful learning activities.

#### *Online job search*

- Evidence from the US and the UK suggests that older workers and potential workers are a lot less likely to use the Internet for job seeking than are those in the younger age groups.

### Disengagement from the labour market

Concern about early disengagement from the labour market is by far the most visible theme on the work-related active ageing policy agenda at the moment, prompted by low employment rates and early retirement trends amongst the older age groups of the working age population in most European countries. Some are “retired” in various ways, sometimes through choice and sometimes through necessity, some are unemployed, and many are on sickness or disability benefits.

The profile of this population varies widely across Europe, depending on pension, benefit structures and other factors. Work quality, workability and employability can also influence engagement or disengagement. Technological change can influence engagement and disengagement decisions through its impacts on these other three dimensions, as well as through more direct impacts on the decisions of older workers (and potential workers) and employers, for example, whether to invest in training in new skills.

The results of studies in this field have been somewhat contradictory. Overall, however, it seems that the introduction of ICTs has so far had only a relatively small direct impact on retirement decisions of older workers but that it may play a role in some cases, even if this is not always a determining one.

### Disengagement from the labour market

- There is not much evidence of any substantial direct impacts of ICTs, *per se*, on the engagement or disengagement decisions of older workers and potential workers.
- Nevertheless, lack of encouragement (by employers) of ICT skill development amongst older workers or lack of interest (on the part of older employees) may influence early retirement decisions of some older workers.
- In addition, it seems likely that a perception of low employability due to lack of ICT skills may be a deterrent to return-to-work for at least some of the older (potential) workers outside the labour market.
- On the other hand, there is emerging evidence that job quality can be very important in the retention or attraction of older people into the labour market; if jobs involving ICTs are good quality jobs then they are likely to be conducive to older worker retention.

### Caring and other informal / unpaid work

People in the older worker (50-64 years) age range, especially women, are major providers of informal care for children and for dependant (elderly or disabled) adults in Europe. As individually and collectively there are only a finite number of hours available to be shared between paid work and this informal work, full employment (in the sense of everyone of working age being in full-time employment) is unlikely to be achievable nor is it desirable. Technological change opens up new opportunities and some new potential risks for older workers and potential workers in these aspects of work-life balance.

### Caring and other informal / unpaid work

- ICTs can help to increase the flexibility of formal working arrangements and thus have the potential to support a better balance between work and care; ICTs that provide help in the caring process have also a potentially very useful role to play.
- On the other hand, where ICTs result in intensification and extensification of work, then the time and space for care may be diminished.
- There has been very little research on these issues; there is a need for more information on the opportunities and risks posed by teleworking for carers and on the possibilities for technology to help working carers to provide care from the workplace (e.g. by remote monitoring of the wellbeing of the person being cared for).

## “Market” failure and the need for policy intervention

Although technology on its own may not be a “killer application” as regards the achievement of high employment rates and later exit ages for older workers, exploitation of the age-friendliness potential of technological change will be an important element of the overall set of supports that are needed to achieve European targets in this area. It can be estimated that age-friendly approaches to ICTs could have direct relevance in relation to retention in employment or attraction (back) to employment for up to 10% or more of the 55-64 years age group. In addition, this can make an important contribution to the achievement of improved quality of work and health and wellbeing of older workers, and of a better balance between paid work and informal work.

The degree to which there is equality of opportunity in access to the potential benefits of ICTs, across the active and inactive older working age group, will be a key factor determining whether such potential gains are realised in practice. This includes wider access to good quality (and age appropriate) jobs and to the skills to compete for such jobs on the labour market.

The development of age-friendly ICTs also has a central economic significance for Europe, both for the productivity of the sectors of the economy where older workers use ICTs in their daily work and for the competitiveness of the European ICT industry itself. Accessibility and age-friendliness of ICT products and services will become a competitive factor, driven initially by public procurement developments, and this is something that has already been taken note of by US industry.

Three main groups of "market" stakeholders - employers, other labour market actors and the ICT industry - have key roles to play in addressing these issues. Overall it must be concluded that, in the EU at least, none have so far given sufficient attention to the role of ICTs in work-related active ageing.

#### **Lack of adequate stakeholder response to date**

##### *Employers and the other social partners*

- Although age management is becoming an increasingly visible theme in human resource circles, so far neither employers, employer organisations nor the other social partners in the EU seem to have given much direct attention to the specific theme of ICTs and work-related active ageing.
- Part of the explanation for this is a lack of awareness of the issues for older workers around ICTs and how these can be addressed; ambivalence of employers towards older workers may also be a significant factor.

##### *Other labour market actors*

- Public agencies play a significant role in the labour market in most European countries, providing incentives towards labour market participation, encouragement and support for job-seekers and wider skills-oriented activities.
- There is little evidence of direct attention to ICTs and work-related active ageing in these contexts as of yet; again, both lack of awareness and a continuing ambivalence towards activation of older (potential) workers are likely to be factors in this.

##### *ICT industry*

- In the US, there is visible attention by the ICT industry to accessibility, driven by public procurement legislation, direct legislative requirements on the telecoms industry and wider anti-discrimination legislation; we have yet to see the emergence of a similar level of visibility of attention to accessibility in the ICT industry's activities in Europe.
- Neither in the US or the EU has there yet been sufficient attention given to the specific accessibility and usability challenges associated with age-related changes.

## Policy and research priorities

In view of the limited stakeholder response to date, there is a need for specific and reinforced policy attention at the EU and Member State levels in this area.

### Policy and research priorities

#### *ICT design*

- Strong implementation of the accessibility provisions in the EU Procurement Directives by the Member States; an EU-driven follow-up and guidance initiative may be needed to ensure that the needs of an ageing workforce are given sufficient attention and priority.
- Prominent attention to accessibility of ICTs for the older workforce in the implementation of the Employment Equality Directive by the Member States; again, an EU-driven follow-up and guidance initiative may be needed to progress this.
- Increased EU support for relevant RTD under the Framework Programmes.

#### *Quality and organisation of ICT-related work*

- Prominent attention to this theme in the new EU programme of work on Health and Safety at Work (2007-2012).
- A specific focus on this theme in the work programmes of the European Foundation and EWON, and in the EQUAL programme and its successors.

#### *Equality of opportunities in access to age-friendly work*

- An EU-wide initiative to provide all of those in the 50-64 years age range with a suitable opportunity to acquire at least basic ICT skills.
- Development of opportunities for occupational mobility, over the working lifetime and amongst older workers and potential workers, to widen access to good quality, age-friendly jobs, including those involving ICTs.

#### *Assistive technologies*

- An EU-driven initiative to encourage more attention to this at Member State and employer levels, including awareness raising, benchmarking of good practice and establishment of common targets across the Member States.

#### *Work-life balance*

- Implementation of a focused programme of research on this theme, covering the advantages and disadvantages of teleworking for older workers who have caring responsibilities and how ICTs can support caring whilst carers are out at work.

#### *ICT-related skills and competencies*

- Research on how older people prefer to learn ICT skills and the best ways to provide ICT learning and training opportunities that meet the needs of older people.

## Theme III - ICT and independent living

This theme focuses on the intersection of demographic ageing with the opportunities offered by ICTs to support independent living and care for older people. There are many ways that ICTs can be used in this domain and there is a growing RTD effort aiming to develop new ICT-based services and supports. The analysis focuses on some critical issues for European policies in this area. What are the currently available ICT-based services and

supports? To what extent are these being deployed and used? What evidence is there of their effectiveness and acceptability? How can policy support appropriate exploitation of the potential in this field?

## Challenges and opportunities

The analysis considers a number of key issues in relation to the challenges and opportunities that technological change poses in this area.

### Increasing demand for social and medical care

Despite the trend towards improved health in later life, demographic ageing will result in increasing demand for care and support.

#### Increasing demand for care and support

- The substantial increases in the numbers of older old (80+) is a major factor; the prevalence of limitations in mobility and other aspects of physical functioning as well as cognitive impairments rises sharply amongst this age group.
- Already today, many of those who suffer from such limitations do not receive adequate help and support; socio-economic developments connected with the demographic change and the increasing demand for long-term medical and social care bear the risk of a further widening of this “care gap”.
- Counteracting these developments is one of the core challenges when it comes to harnessing the potential provided by technological innovation in relation to the demographic change.

### Technologies with potential for supporting older people

Independent Living Technologies (ILTs) in four fields of application present a lot of potential in the context of the emerging care challenge.

#### Four key Independent Living Technology (ILT) fields

##### *Assistive Technology (AT)*

- Assistive Technologies (ATs) are products that are designed to compensate for motor, sensory and cognitive difficulties frequently experienced by older adults.
- The range of ICT-related Assistive Technologies and potential applications is very wide; just a few examples are speech technology (speech recognition, synthesis, coding and analysis), portable devices to help find lost objects and the emerging development of more powerful devices such as robots designed to support dependent people in carrying out a variety of tasks.

##### *Smart homes*

- Opportunities to support the independence of older people are being provided by adding “intelligence” to the immediate home environment through the networking of ICTs.
- Here, ICTs are utilized to integrate various appliances, devices, and services within the home, to ultimately enable a resident to control and monitor his entire living space from any location within the home; technology can range from relatively simple home automation functions such as turning lights on/off, smoke alarms or access control to fully automated home systems and networks.

#### Four key Independent Living Technology (ILT) fields (continued)

Remote social and medical support

- ICTs can also enable remote provision of medical and social care.
- In principle there are a very wide range of applications including, for example, alarm systems addressing security related needs, remote monitoring of vital data for medical purposes and provision of social support and reassurance by videotelephony.

*Ambient intelligence*

- This is an emerging RTD domain that can be expected to deliver independent living solutions addressing the wider living environment (e.g. the street, public transport, public buildings, shops and so on).
- Examples include intelligent self-service terminals, information kiosks and transport systems as well as mobile communication devices providing tracking/alarm services or other location-based services, all flexibly adapting to the specific communicational, functional and cognitive needs of older people.

### Improving the quality of life of care recipients

The ILT domain offers a lot of potential for improving the quality of life of older people with functional limitations or ill health.

#### Potential for improved quality of life

- Evaluations suggest that ILTs have significant potential to improve the quality of life of older people who need support in their everyday lives; case studies suggest that ILTs can support significant gains in Quality Adjusted Life Years (QUALYs) although there has yet to be enough research of this nature to allow wide-scale generalisations.
- Examples of benefits include more independence and possibilities to live an active life, greater confidence felt by ILT users and immediate availability of help in emergency situations, and faster discharge of older people from hospital and delayed admission to institutional care.

### Empowering older people, including those who are carers

ILTs also have the potential to contribute in various ways to the empowerment of older people.

#### Empowering older people, including those who are carers

- ILTs offer the potential to empower older people to participate in social and economic life in a wider sense; this applies not only to those with functional imitations or ill health, but also to the many older people who themselves provide informal care to others.
- ILTs enabling older carers to provide care from the workplace (e.g. by remote monitoring of the well being of the person cared for) may help older family carers to more fully participate in economic and social life, although a lot more research is needed on the risks and opportunities that may be presented.
- The issue of how ILTs could be harnessed to enable older people to take a more active role in making care and treatment choices and to participate in the management of the care process has also been highlighted by some analysts; however, we currently do not have a very good understanding of these processes and there is a need for research on the particular role that ILTs could play.



## Cost-effectiveness of care service provision

Consideration also needs to be given to the relative merits of investing in ICT-based solutions as opposed to paying for other forms of support, including more labour-intensive service models.

### Cost effectiveness of ILTs in care service provision

- For relatively simple solutions, such as item locators and medication dispensers, costs do not seem to be a major issue when compared with benefits experienced by older people and by their carers.
- For more complex (and expensive) ILT systems it is difficult to make generalised cost benefit assessments; depending on structural peculiarities of national welfare and health systems, costs as well as benefits may accrue a various levels and to a various actors (e.g. care recipients and their families, municipalities, charity organisations, public and private funding organisations, and commercial service and technology providers).
- Apart from cost-benefits in “front office” aspects of care services, consideration also needs to be given to the “back office”; here, productivity gains may become possible through ICT, for example, through more efficient coordination of the various actors involved throughout the entire service chain.
- Overall, many case studies suggest that there is clear potential for cost-benefits to be achieved from many ILTs; however, a lot more research is needed if we are to fully understand where these benefits are most likely to be found and how they can best be achieved within complex social/medical care supply systems.

## Ethical considerations

There are various ethical issues that also need to be considered, including the possibility that the cost-saving potential of ICT may become the main driving force to the neglect of service quality and the possible emergence of a creeping de-humanisation of care and the everyday lives of those needing care. We must avoid the emergence of inequitable scenarios in this regard. One such scenario would be where ILTs were provided as an “extra” in addition to good quality human care for some (those who can afford it) but as a substitute for quality human care for others (those who cannot afford it). Another would be where, irrespective of the human care aspect, helpful ILTs were only available to those who could afford to pay for them themselves.

### Ethical considerations

- One important issue concerns the respective merits of human care and of ILTs; the theoretical discourse in this regard has reflected a continuum of opinion, ranging from views that technology-based care is inevitably de-humanising to uncritical (“technology-push”) championing of technology for care.
- In fact, the levels of utilisation of ICTs in care are not yet sufficient to draw any robust conclusions on what the overall social implications might be, positive or negative; a possible exception to this are the now quite widespread social alarm systems for older people in many countries – in this regard, the benefits for all seem well proven and it is instructive that there has been little if any voicing of concerns about negative social impacts by older people’s organisations.

**Ethical considerations (continued)**

- Use of ICTs to support people with dementia and their carers is one area where considerable attention has been given to ethical issues, prompted by the difficulties of informed consent from people with dementia and the possibility of conflicts of interest between those receiving and providing care; in this field expert guidelines have been developed to support ethically and socially appropriate usage of ICTs.
- More macro-ethical issues also arise in relation to ILTs, particularly as regards equality of access to quality and preferred forms of care; this will be an important issue on the future, as existing disparities in access to care between rich and poor older people may well widen in many countries.

## Insufficient market response and a need for public policy intervention

### Diverse market structures and maturity levels

The ILT domain has not yet matured in terms of well-established products that are widely available. Only social alarms and a variety of AT devices are widely available today. Many ILT implementations exist only in experimental settings and levels of awareness what is possible tend to be low among potential target groups.

**Market structure and maturity***Assistive Technology (AT)*

- It has been estimated that there are currently more than 20,000 Assistive Technology (AT) products available in Europe; however, although there is no reliable estimate of the numbers of people actually using AT, it is widely accepted that there are significant market and supply failures in Europe in this domain.
- In most countries the public sector plays an important intermediary role, sourcing AT and supplying it to those who need it who meet define eligibility criteria; rules about what AT is provided and who can avail of public support vary widely across Europe.
- The market strongly lacks transparency due to the complexity of current delivery systems and processes, and lack of awareness of what's available restricts the expression of demand.
- On the production side, most AT products are produced in small series, resulting in high price levels; in addition, complex distribution channels and the large number of very small manufacturers tend to hamper technology transfer from the research domain to the market.

### Market structure and maturity (continued)

#### *Smart homes*

- Despite considerable research effort to exploit smart home technology for the benefit of older people and people with disabilities, actual implementation is still largely confined to experimental settings and demonstrators; technologies and standards seem to have failed to create the right conditions for a mass market for smart home applications.
- The first Code of Practice expected to be available by the end of 2005 as part of the eEurope 2005 initiative may give the smart home domain a critical push towards the development of marketable products; also, more recent activities of large players from the consumer electronics industry may contribute to the emergence of a commercial value chain along which home networking products and services may soon flow to the consumer.
- Without public intervention, however, it seems unlikely that older people and people with disabilities will be targeted by these commercial developments for the foreseeable future.

#### *Telecare / telemedicine*

- Social alarms are the most widely available ILT application today, although actual take-up varies considerably across countries; overall some 4% of the 50+ population in the EU15 use such alarms, with the highest levels in the UK (16%).
- Despite extensive piloting in Europe and beyond, more advanced ILT implementations such as dwelling-based health monitoring have yet to become mainstreamed within health care services; both technical challenges and lack of appropriate business models present barriers.
- Nevertheless, there have been some successful examples of integration of well established ILT components into day-to-day community care practices and this shows that ICT-mediated provision of social and medical care can be viable and sustainable.

#### *Ambient intelligence*

- This is an emerging RTD domain that has yet to develop into a coherent market; public encouragement of RTD and deployment would help to accelerate its development and to leverage the undoubted potential to support independent living for older people.

### **Huge (unmet) potential demand for ILTs**

Although assessment of demand is difficult because markets and supply are not yet well developed it is nevertheless clear that there is huge potential demand given the number of older people for which the various ILT domains are ostensibly of relevance.

#### **Huge (unmet) potential demand**

- Even at the current relatively early stage of demographic ageing, each of the ILT domains already has relevance for tens of millions of older people in Europe.
- This potential market will double or even triple by 2050, in line with the large projected increase in the numbers aged 80 years and older.

## Policy and research priorities

Given the current market failures in the ILT domain, a number of policy and research priorities can be identified.

### Policy and research priorities

#### *Improving uptake of useful technologies that already exist*

- EU-driven support for large-scale real-world trials (e.g. under the eTEN and RTD programmes or Articles 169/171 of the European Treaty), with an emphasis on needs-driven integration of ICT-mediated health/care processes.
- Increased attention to the potential offered by ICTs in relevant policy coordination processes (e.g. the OMC process in the fields of health care and social inclusion)
- Promotion of technical standardisation and interoperability in key areas, including health care, smart homes and assistive technology.
- ICT-related awareness raising in the care and independent living domain; identification and exchange of good practice, promotion of both “high-tech” and “low-tech” solutions.
- Continued and reinforced efforts to overcome market fragmentation in the assistive technology domain.
- Socio-economic research enabling policy and public/private market actors to better understand market dynamics and potentials.
- Continued applied RTD in relation to the care and independent living domain under the Framework Programmes.

#### *Avoiding undesirable impacts of ILT uptake*

- Establishment of an EU network to address ethical issues.
- Promotion of quality standards or codes of good practice in relation to social and medical telecare.
- Socio-economic research to enable a better understanding of micro-ethical (e.g. potential threats to privacy and dignity of the dependent individual) and macro-ethical impacts (e.g. possibility of widening income-related divides in access to quality of care and quality of life).
- Socio-economic research to enable a comprehensive understanding of costs and benefits that may come with increasing technology application in the care and independent living domain.

#### *Harnessing the potential offered by emerging technologies*

- Increased emphasis on the importance of attention to this field in all of the main fields of technological innovation (including basic research, technology watch and technology transfer to support this field).
- Continued RTD efforts to exploit emerging technologies for care and independent living purposes under the framework of relevant RTD programmes (e.g. the IST programme) or under articles 168/171 of the European treaty.
- Socio economic research to better understand in which way needs that come with the ageing process threaten independence and the benefits ICTs may hold in this regard.
- Continued emphasis on the involvement of key actors groupings (e.g. ICT industry, formal/informal carers, financing/reimbursement bodies, older end users) in the RTD process.