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**HEALTH AND AGEING IN THE KNOWLEDGE SOCIETY:  
EMPLOYMENT, SOCIAL COHESION AND E-HEALTH POTENTIAL.**

## **ESDIS WORKING DOCUMENT**

### **HEALTH AND AGEING IN THE KNOWLEDGE SOCIETY: EMPLOYMENT, SOCIAL COHESION AND E-HEALTH POTENTIAL.**

This paper is the result of co-operation between the Commission services, in particular DG Employment, Social Affairs and Equal Opportunities, and ESDIS (the High Level Group on Employment and Social Dimension of the Information Society). Commission coordinators were: Detlef Gerhardt, Lidia Pola and Marc Goffart.

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## EXECUTIVE SUMMARY

In the last decades, the penetration of Information and Communication Technologies (ICT) has had an impact in different ways on our health: at work, in our health behaviour and in health care systems. This working document presents how health is influenced by the use of ICT. In particular on the one side it looks at the ICT impact on occupational health and safety including specific conditions of the health sector. On the other side it focuses on the role technologies can play, both for the well-being of individuals and also on the risks of new forms of exclusion it can cause. The document is based on studies as well as examples and practices provided by Member States. It will raise the awareness of, and propose some solutions for, these crucial issues which will be important also in the future.

The working environment and conditions have changed in particular as the introduction and use of Information and Communication Technologies (ICT) has modified the organisation of work. ICT was expected to bring high returns in terms of new skills and better working conditions. This paper examines to what extent these expectations have been met.

On the one side there is a high potential for improving working and job situations through ICT applications. On the other side the evolution of work in the knowledge society shows that several risks need to be kept under control in order to avoid negative impacts on health, safety and well-being at work as well as on innovation.

When introducing ICT in the workplace and reorganising work it is important not to change only specific elements, often with the aim of achieving short term economic benefits, but to adopt a holistic view taking into account the whole working situation including the social elements and the balance with private life. Good examples exist and research projects provide also a good potential for improvement of working conditions.

Older workers have to tackle the specific situation of changing functional performances and to adapt to new challenges of the knowledge society. The accessibility and usability of ICT as well as the use of potential assistive technologies are important areas for further development.

A sector of particular interest is the health sector which depends more and more on information systems. An essential basis for good working conditions and at the same time for high quality health services is a high qualification of health professionals in the use of new technologies. This knowledge is needed at all levels including less qualified personnel. Due to the rapid organisational and knowledge changes which have taken place, vocational skills now need to be continuously updated.

The health situation of European citizens has constantly improved. ICT has the potential to enable further improvements. Health and health care will be supported more and more by the use of ICT systems which meet the needs of citizens, patients, healthcare professionals, healthcare providers and policy makers ("eHealth").

Modern health care is based on new service models like "seamless care" which puts the patient at the centre of service networks.

eHealth can assist health professionals by providing mechanisms for client case management and efficient sharing of patient information among care professionals. It has the capacity to monitor and protect public health through better health surveillance. Furthermore, citizens can be better informed by high quality health-related information services which can provide online access to health information and support communities concerned with health related services.

Patients can test their specific health conditions, using e-devices in their own home (referred to as patient self-management or telemedicine). Many senior citizens may, if they become housebound, benefit from the new possibilities of medical self-management, as well as continued connection to clinicians and contact with other patients. eHealth can also enhance the social inclusion of disadvantaged persons.

Most EU Member States have recently launched national and regional eHealth programmes. However the impact of eHealth implementation differs across Europe.

Public action aimed at guaranteeing access for all regardless of income and wealth to health information and services will need to ensure accessibility of health resources through multiple channels making infrastructure and digital skills available to all citizens, including those at risk of exclusion, and ensuring compliance of health related sites with eAccessibility standards, as well as supporting control on the quality of information online and to ensuring security, privacy and confidentiality of data.

Moreover, in order to facilitate the free movement of citizens and to give easier access within the EU to the different health care systems, a first European health insurance card has been created which is initially aimed at replacing the paper forms needed for temporary stays. This should also reduce administrative procedures.

# 1 Introduction

## 1.1 Scope

This report presents different aspects of health in the knowledge society focussing on the impact on work and social cohesion.

It will cover in particular the aspects of prevention of work related risks and of access to high quality care systems for both areas of employment and social inclusion.

On the **employment side**:

- Firstly, it will look at the issue of **occupational health and safety in relation to Information and Communication Technologies use**; both opportunities and threats should be considered taking into account in particular issues of accessibility and usability for older workers.
- Secondly, it will examine the specific conditions for work in the healthcare sector, which is a growing sector and one where ICT is increasingly used at all levels supporting the health workers' task and consequently improving health services.

On the **social inclusion side**:

- Firstly, the report will focus on the role **technologies** can play in improving the **well-being of individuals** by improving the dissemination of health information, healthcare at home and in hospitals as well as facilitating **advocacy and support groups** which can bring substantial improvements and relief to people suffering from ill health.
- Secondly, it will consider the risks that ICT might cause **new forms of exclusions** from health and care services and provision. Those already on the margins could be further excluded by the growing use of ICT to (self) diagnose and deliver.

## 1.2. Policy Context

Since the Maastricht treaty (1993) it is fully accepted that public health also needs to be dealt with at the European level. Over the years, strategies and Community actions have been developed (see box).

THE EUROPEAN POLICY AGENDA ON HEALTH – *Synopsis of evolutions 1993- 2005*

*From Maastricht (1993) to the Barcelona Council (2002)*

In the Maastricht Treaty (1993) public health was given a legal base for the first time (Art. 129), encouraging cooperation among Member States, prevention of diseases and incentive measures. At the end of the 1990s the Treaty of Amsterdam expanded the powers of the Community in the public health field. According to Article 152, actions in the public health area should: contribute to the attainment of a high level of health protection; improve health; prevent human illness and disease; prevent sources of danger to health and ensure that all EC policies protect health.

In May 2000 the Commission proposed a new health strategy promoting an integrated approach to health related work at Community level. The 2002 Programme of Community Action in the field of public health focuses on improving health information and knowledge, strengthening the capability for coordinated rapid response to major health threats, targeting actions to promote health and prevent disease through addressing health determinants across all policies and activities. The Sixth Framework Programme for research provides for policy and orientated Research and Development (R&D) research relevant to the area of social policy and to the health sector in particular.

The responsibility for health care provision and funding lies with the Member States; however, this responsibility does not prevent basic freedoms – such as provision of services, circulation of medical

products, movement of workers – or other Community policies from applying in this area. In fact, health is a crosscutting issue in the European Social Agenda and the EU strategy for sustainable development, both of which constitute important elements in the Lisbon strategy

In 1999, the Commission and the Council stressed that ensuring high quality and sustainable health care was one of the key areas of social protection, in which a concerted modernisation effort should be undertaken. At the Gothenburg Council (2001) the Commission was requested to prepare a report on the “consequences of an ageing society in the field of health care and care of the elderly”. The Barcelona Council (2002) fully endorsed the three main challenges identified in the Commission report, namely to guarantee: **access for all regardless of income and wealth; a high level of quality of care; the financial sustainability of care systems.**

Health and Safety at work is one of the most important dimensions in European social policy. A Community Strategy in this area has been developed for the period 2002-2006, taking into account changes in society and in the world of work, and based on preventive measures and building partnership between all players.

#### *Developments after 2002*

Recognising the urgent need to quickly exploit the ICT related opportunities in a knowledge-based economy, the eEurope Action Plans 2002, 2005 and the new Information Society strategy i2010 set out an agenda for supporting the deployment of online applications and services across the EU. In 2004, the Commission published the Communication on “eHealth – making healthcare better for European citizens: an Action Plan for a European eHealth area”, where the potential contribution of eHealth in tackling the core challenges faced by health systems around the world is highlighted.

In the same year, the Commission Communication on “Modernising social protection for the development of high-quality, accessible and sustainable health care and long-term care: support for the national strategies using the "open method of coordination" (OMC) was adopted, which establishes a framework allowing for the exchange of experience and best practice among Member States.

As of 2005, and in order to streamline the OMC process by drawing together work in the areas of social inclusion, pensions and healthcare, an annual Joint Report on Social Protection and Social Inclusion was published. In line with the revised Lisbon strategy, the 2005 report stresses the need to improve EU level coordination mechanisms and to modernise social protection systems; accessible, quality and sustainable health care systems are expected to play a vital role not only in combating disease and vulnerability to social exclusion but also in maintaining a productive workforce.

On 6 April 2005 the Commission adopted a Health and Consumer Protection Strategy and a proposal for a European Parliament and Council Decision creating a new Community Programme for Health and Consumer protection 2007-2013. This new strategy and programme proposal reinforce and extend the EU Public Health Programme and the programme in support of EU consumer policy. In addition to the three existing health strands, three new strands are envisaged: delivery of an efficient response to health threats; preventing of diseases; and fostering of co-operation between health systems.

The Lisbon European Council set the twofold strategic goal of Europe becoming the most competitive and dynamic knowledge economy in the world and to tackle this task in the context of Europe's social model. This means the economy should be capable of sustainability and creating "more and better jobs".

The transition to a “knowledge-based economy” is marked by profound changes affecting society and quality of life, employment and quality of work. Health protection policy is one of the fundamental components to reach the goal set by the Lisbon European Council.

Crucial elements of the health policy are **prevention** of work related diseases and **access** to high quality care systems.

## **- Prevention**

Every year millions of employees have to quit their jobs and step out of their working life before their retirement age due to health problems. There is a dramatic increase in chronic diseases of the musculoskeletal parts of the body as well as psychological diseases. This is not only an economic problem but has also to be seen under the aspect of creating and maintaining a better quality of life with good capacities during the whole life-time, and improving mobility.

Work in the knowledge-based economy presents new challenges and opportunities to this problem. Therefore it is important to track, monitor, anticipate and prevent new diseases or health problems appearing in the knowledge-based society such as increased stress at work even if the trend has probably shifted to less numerous physical strain and diseases than in the industrial working environment. The situation of older workers needs particular attention in this context.

Regarding stress at work, the European Commission has produced guidelines targeted to Member States, employers and trade unions. Employers and trade unions signed an agreement to better prevent stress at work in the EU on 8 October 2004.

The European Agency for Safety and Health in Bilbao organised EU wide campaigns on work-related stress during 2002<sup>1</sup> and on musculoskeletal disorders during 2000 which also included Repetitive Strain Injury often associated with computer use. For both events significant documentation on good practices, facts, reports, figures, etc. were produced<sup>2</sup>. These initiatives show that prevention of work-related diseases is a crucial element contributing to support the Lisbon goals.

## **- Access**

In a recent Commission Communication<sup>3</sup> three main reasons related to employment, social inclusion and cohesion have been given for the importance of high quality access to health care:

- Social cohesion is reinforced by access to quality care and better access to care is acknowledged to be a way of mobilising the potential of the EU's workforce in the context of an ageing and possibly shrinking population. In order to provide high quality health systems, well trained professionals are a necessary condition.
- Health and long-term care represent an important potential for employment. Therefore it is vital to have a sufficient number of trained professionals and for them to have quality jobs. Improving the quality of jobs is essential to ward off early retirement.
- Demographic ageing will imply more age-related illnesses and more people in long-term care. The response to these needs will be a wide range of services including care at home and in specialised institutions and better networking of care providers.

The tools of the information society can be of great help in tackling the problems highlighted in this document.

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<sup>1</sup> <http://osha.eu.int/ew2002/>

<sup>2</sup> <http://osha.eu.int/ew2000/>

<sup>3</sup> Commission Communication 'Modernising social protection for the development of high-quality, accessible and sustainable health care and long-term care: support for the national strategies using the "open method of coordination"' - COM/2004/0304 final of 20.4.2004.



A further Commission Communication highlights the use of information and communication technologies and services for improving many areas of healthcare and making medical systems more effective in providing better health information to everyone (hereafter referred to as eHealth)<sup>4</sup>. The same document defines a framework for coordinated actions towards the development and implementation of a European eHealth Area.

In fact the Information Society offers new possibilities for improving almost every aspect of healthcare, from providing better health information to everyone to making medical systems more effective. eHealth has the potential to improve the lives of all Europeans while simultaneously improving the efficiency of healthcare systems.

#### Recent eHealth Policy Developments

The issue of eHealth is addressed under the eEurope 2005 Action Plan. Soon Europe should have modern **public eHealth services online**. Specific actions are proposed: Health information networks; Electronic health cards (i.e. allowing access to medical records etc.) and health insurance cards (i.e. facilitating patients' file management), and online health services. A number of concrete actions are being implemented at EU and at Member State levels<sup>5</sup>.

A core set of quality criteria for health related websites were already drawn up under the previous eEurope2002 Action Plan, based upon consensus among specialists in the field, health authorities and prospective users<sup>6</sup>. The eEurope 2005 Action Plan confirms that "*it is critical that eHealth content and services are developed efficiently, are available for all and health related web sites comply with established quality criteria*".

At a first eHealth Ministerial Conference in 2003, Ministers recognised<sup>7</sup> the importance of secure shared eHealth applications and reiterated their commitment to developing an information system for the early warning, detection and surveillance of health threats on (non-) communicable diseases. Ministers agreed to implement and share best practices in eHealth and noted the potential for citizen empowerment through widespread availability of appropriate health information on the Internet, with guarantee for high quality standards, i.a. through defining quality criteria<sup>8</sup> or through EU level Quality Seals<sup>9</sup>. The Ministers emphasised that access should be widened through the provision of public access points as well as through compliance with guidelines on Web Accessibility<sup>10</sup>.

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<sup>4</sup> "eHealth refers to the application of information and communication technologies across the whole range of functions that affect the health sector. eHealth tools or solutions include [...] products, systems and services for both health authorities and professionals as well as personalised health systems for patients and citizen." Commission Communication 'e-Health – making healthcare better for European citizens: An action plan for a European e-Health Area'. COM (2004)356 final of 30.4.2004. - [http://europa.eu.int/information\\_society/doc/qualif/health/COM\\_2004\\_0356\\_F\\_EN\\_ACTE.pdf](http://europa.eu.int/information_society/doc/qualif/health/COM_2004_0356_F_EN_ACTE.pdf)

<sup>5</sup> eEurope 2005 Mid-term Review *Background Paper*, Commission Staff Working Paper, SEC (2004) 278 of 3.3.2004.

<sup>6</sup> Commission Communication "Quality Criteria for Health related Websites", COM (2002) 667 final of 29.11.2002 - [http://europa.eu.int/information\\_society/europe/ehealth/doc/communication\\_acte\\_en\\_fin.pdf](http://europa.eu.int/information_society/europe/ehealth/doc/communication_acte_en_fin.pdf)

<sup>7</sup> Ministerial Declaration [http://europa.eu.int/information\\_society/europe/ehealth/conference/2003/doc/min\\_dec\\_22\\_may\\_03.pdf](http://europa.eu.int/information_society/europe/ehealth/conference/2003/doc/min_dec_22_may_03.pdf)

<sup>8</sup> See footnote 7.

<sup>9</sup> Community action programme on public health (2003-08) Decision N° 1786/2002/EC of 23/9/2002.

<sup>10</sup> Commission Communication "Accessibility of Public Web Sites and their Content", COM(2001)529 of 25.09.2001.

During a second<sup>11</sup> and third<sup>12</sup> high-level European eHealth Conferences in 2004 and 2005 stock was taken of further eHealth developments, particularly in support of better health for European citizens. In the Conclusions following the most recent eHealth 2005 Conference, the Ministers committed to raising awareness of the pressing need for a more integrated and interoperable European health information space in a staged and structured approach over the next five-year period<sup>13</sup>. Europe's best eHealth solutions were exhibited at all three eHealth conferences, with the most outstanding receiving the eEurope for eHealth Awards<sup>14</sup> in 2003 and 2004.

As the knowledge society is playing an ever-increasing role, the health aspects will have a substantial impact on a number of key issues pertaining to employment and social inclusion. The high level group for the Employment and Social Dimension of the Information Society (ESDIS) has previously addressed issues of interaction between health and ICT use<sup>15</sup> and health on-line services for disadvantaged groups<sup>16</sup>.

The possibilities offered and the threats posed by ICT for people with disabilities have already been extensively analysed in ESDIS work on eAccessibility<sup>17</sup>.

The current report by ESDIS complements and extends previous work.

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<sup>11</sup> <http://www.ehealthconference2004.ie/> - 'Supporting the European Citizen', 5-6 May 2004 in Cork, Ireland

<sup>12</sup> <http://www.ehealth2005.no/> - eHealth 2005 Conference in Tromsø, Norway on 23-24 May 2005.

<sup>13</sup> See <http://europa.eu.int/idabc/en/document/3205/580> - HEALTHGATE: The EU Health Portal.

<sup>14</sup> <http://www.e-europeawards.org/>

<sup>15</sup> *'Information Society jobs - quality for change – Exploiting the Information Society's contribution to managing change and enhancing quality in employment'* - SEC(2002)372 – and *'Building the Knowledge Society : Social and Human Capital Interactions'* – SEC(2003)652

<sup>16</sup> *'e-Inclusion : The Information Society's potential for social inclusion in Europe'* – SEC(2001)1428; Subsequently it was referred to in a Council Resolution on e-Inclusion adopted in October 2001 [http://europa.eu.int/comm/employment\\_social/knowledge\\_society/background\\_en.htm](http://europa.eu.int/comm/employment_social/knowledge_society/background_en.htm)

<sup>17</sup> [http://europa.eu.int/comm/employment\\_social/knowledge\\_society/eacc\\_en.pdf](http://europa.eu.int/comm/employment_social/knowledge_society/eacc_en.pdf)

## 2 PART I: BETTER JOBS IN THE KNOWLEDGE-BASED SOCIETY

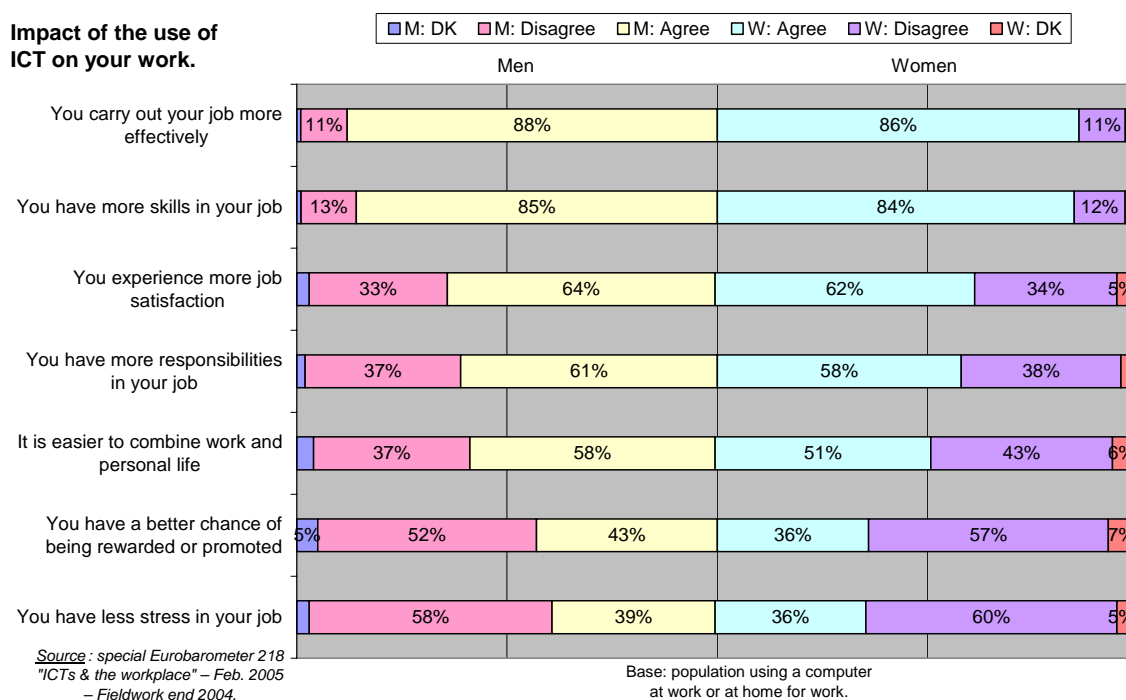
This section outlines some expectations and trends for improving the quality of jobs in the knowledge-based society, but also indicates a number of worrying trends.

### 2.1 Expectations and trends

In the last decades, the working environment and conditions have changed in particular due to the introduction and use of ICT. These transformations were often mainly motivated by a need to increase competitiveness in the short-term and not always to improve the quality of work. This approach has had an important influence on the way **work organisation and working conditions** have evolved.

According to a recent Eurobarometer survey 2005<sup>18</sup> European people using a personal computer at work (or at home for work) appreciate the positive effects of ICT in the workplace: ICT users are of the opinion that they carry out their job more effectively (87% agree), they have more skills in their job (85%) and experience more job satisfaction (63%). A slight majority also feels that ICT make it easier to combine work and personal life: 55% overall agree, but only 51% of women.

A majority of employees does not see any benefit of ICT use for their career prospects: only 36% of women believe ICT improves their chances of being rewarded or promoted. Even though men seem to be in general more positive about the impact of ICT on their work, only 43% of male employees see a positive impact on their career. When asked whether ICT use at work reduces stress in their jobs, 59% disagree and only 38% agree with this statement (For a more in-depth analysis of the stress-related item, see later, under 2.2.1 "New Risks").

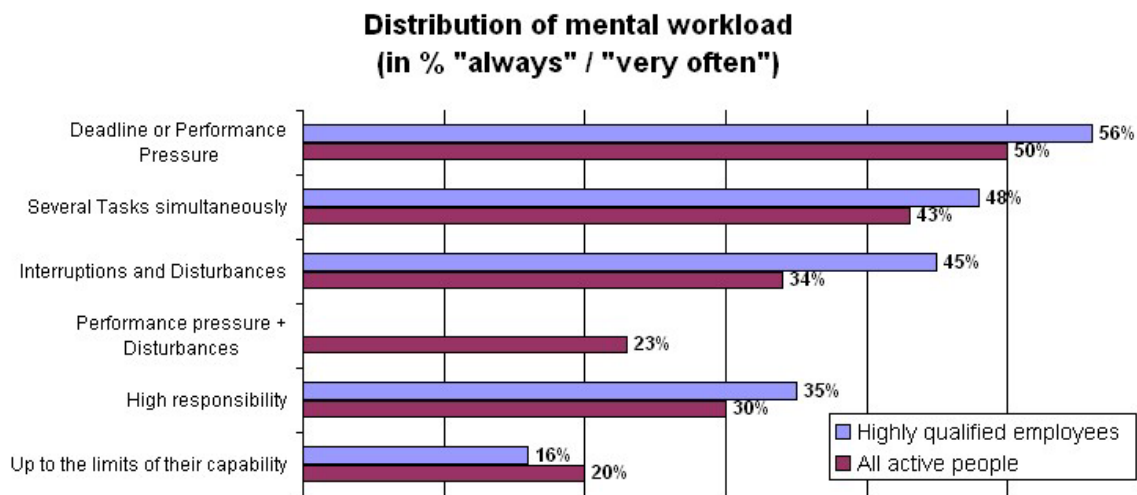


<sup>18</sup> Special Eurobarometer 218 "Information and Communication Technologies and the workplace" – Published February 2005 – Fieldwork November/December 2004.

Initially the introduction of ICT was expected to bring greater opportunities in improving the return on skills. It was also thought to provide more autonomy, bring more responsabilisation, creativity and collaboration between employees, and allow working in a flatter hierarchical model with greater freedom from numerous control mechanisms. However this view has now to be compared to **real trends** in the majority of enterprises.

- As one study shows<sup>19</sup>, work organisation, working conditions and protection can become poorer as shown e.g. by the example of some Internet retailers. The result is that employees encounter working conditions with work overload and working hours and rhythms that are incompatible with private life.

- Teamwork towards common goals has been organised in a motivating way with a good level of autonomy, much responsibility and initiative. However, groups are given very tight objectives often without the necessary resources. This creates tensions between group members e.g. about the organisation of working hours. On an individual level, it brings high time pressure and very long working hours<sup>20</sup> (see figure below on frequency of work under the different types of workload: an example from Germany<sup>21</sup>) shows that this can sometimes lead to burn-out. Often, autonomy increases but control over work and its organisation, as well as private life, can diminish.



Source: Institut für Arbeitsmarkt und Berufsforschung Bundesinstitut für Berufsbildung  
(c) Input Consulting GmbH (2002)  
Jansen 2000

- Another issue is the competence required, but not used. In call centres e.g. communication competences are requested but the work may be so procedure-based and so tightly timed that these competences are not used and no new skills can be developed.

<sup>19</sup> P. Vendramin, G. Valenduc; Technologies de l'information et de la communication, emploi et qualité du travail; Ministère Fédéral de l'Emploi et du Travail, Belgium, 2002

<sup>20</sup> C. Zanker; Neue Massstäbe für humane Arbeit; Ver.di publication, 2002

<sup>21</sup> Jansen, R., Arbeitsbedingungen, Arbeitsbelastungen und –veränderungen auf der betrieblichen Ebene; in Dostal, Jansen, Parmentier: Wandel der Erwerbsarbeit: Arbeitssituation, Informatisierung, berufliche Mobilität und Weiterbildung, Beiträge zur Arbeitsmarkt- und Berufsforschung 231, 2000

Competitiveness and profitability are the driving factors for the adaptation of work organisation. As ICT enables employees to give quicker reactions to client requests and constraints, working hours and rhythms are often adapted to clients' requirements. The just-in-time approach brings more urgent requests and this strong client orientation implies new working rhythms. While work becomes more responsive to customer needs and thus more competitive, this situation also increases the rapidity of intervention and time pressure for employees.

The introduction of ICT is also the basis for the phenomenon of different forms of **flexibility** in terms of working time, localisation, status and contracts, relations of subordination and mobility. It could reinforce the dualisation of the labour market<sup>22</sup> between on the one side a "central" population of stable groups benefiting from the advantages of new work organisation and on the other side "peripheral" groups (like subcontractors) which need to be more available and flexible. Work which is not acceptable to core workers is often carried out and accepted by subcontractors.

All the organisational changes can result in more radical restructuring which become more and more frequent in particular when the enterprise strategy is mainly based on economic and financial market considerations. This brings considerable uncertainties to the employees' population concerned and decreases their corporate spirit for their company.

The intensification of work permits less and less space for developing **social relations and networking** within companies. On the assumption that e.g. corporate identification of workers and time for social relations and networking are important elements to support innovation activities inside a company, these trends show that **innovation** could be put at risk by the development of the knowledge-based society.

As a first conclusion, it can be emphasised that ICT can provide potential benefits to the working environment. Nevertheless work in the knowledge society has evolved in a way that presents risks for the quality of working conditions. If these factors are not kept under control and taken into account in the re-organisation of work and the re-engineering of workplaces, the decrease of quality of work through uncertainties and stronger time pressure at work may generate more work-related stress with increasingly negative impacts on health, safety and well-being at work as well as on innovation.

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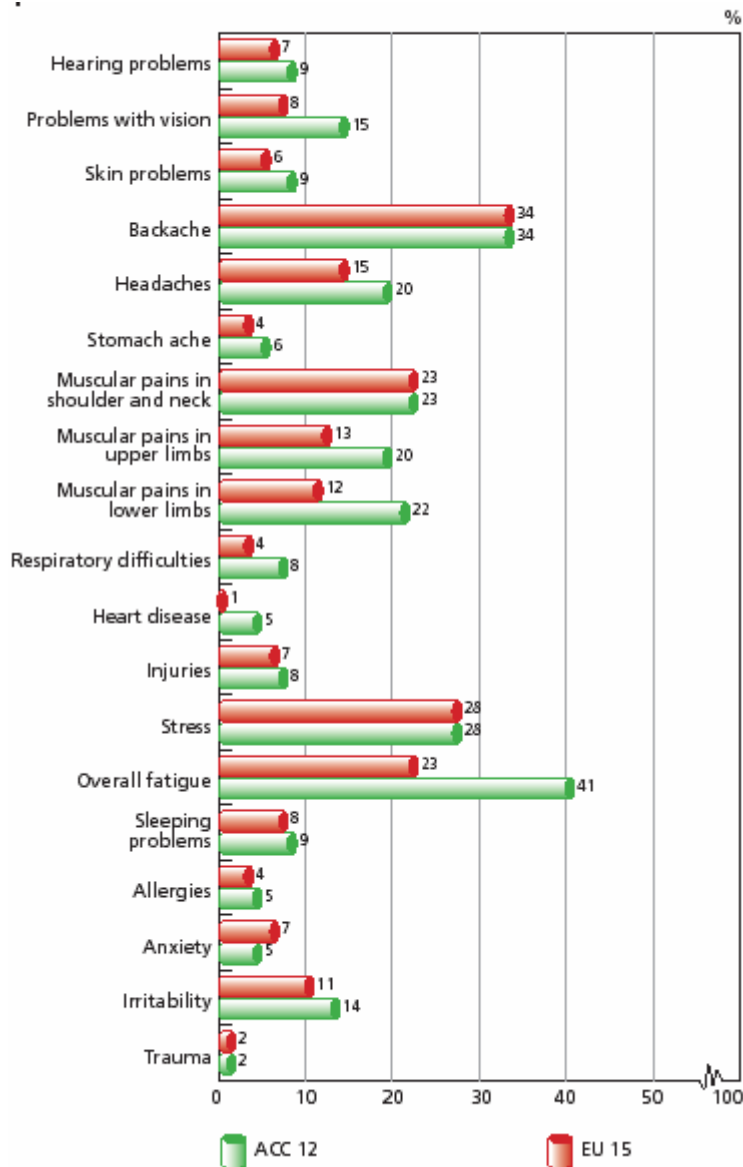
<sup>22</sup> Vendramin, P.; Valenduc, G. - See footnote 16

## 2.2 Occupational health and safety aspects of work in the knowledge society

Better jobs mean mainly healthier and safer jobs. In a previous report<sup>23</sup>, ESDIS identified some main challenges to address effectively new health and safety risks due to the Information Society. These included prevention of physical impairments and psycho-social effects, in particular by

- speeding-up pending **legislation** and reviewing existing legislation concerned with risks, in line with the Community's new health and safety strategy;

### Workers reporting exposure to work-related health problems



- underlining the importance of **corporate social responsibility** to enhance voluntary prevention;

- enhancing the **monitoring, consultation and training** on new health and safety risks.

### 2.2.1 Newer Risks

Numerous studies analyse work related health problems. As it appears from the figure besides<sup>24</sup>, the major work-related health problems are:

- Back pain (reported by 34% of workers)
- Stress (28%)
- Muscular pains - neck and shoulders (23%)
- Overall fatigue (23%).

Two types of risks are associated with working with ICT: physical and psychological risks.

<sup>23</sup> SEC (2002)372 - [http://europa.eu.int/comm/employment\\_social/knowledge\\_society/quality\\_en.pdf](http://europa.eu.int/comm/employment_social/knowledge_society/quality_en.pdf)

<sup>24</sup> Survey on working conditions in the acceding and candidate countries ACC12= New Member States+BG+RO (2001 - <http://www.eurofound.eu.int/publications/EF0306.htm>, complementing the Third European Working Conditions Survey (2000 - <http://www.eurofound.eu.int/publications/files/EF0121EN.pdf>)

**1- Physical** ill health can be linked with inadequate or ergonomically ill-adapted equipment or working positions or the combined effects of both. Repetitive strain injury is one of the major problems arising from ICT work. It describes a range of conditions characterised by pain, numbness or discomfort in different parts of the upper body (head, arm, shoulder, neck). Specific well-known risks come from excessive use of a computer mouse because its use is concentrated on one hand. The other major possible source of physical risk is electromagnetic radiation from the screens or computers or damage to vision from inappropriate conditions of use.

Many ergonomic challenges were identified in the 1980s; therefore most large companies and public sector organisations have a part of their human resource department which acts to inform personnel about these risks and help to avoid these difficulties. Therefore these problems are more and more under control even if they have to be closely monitored. In some countries factories inspectorates have prepared and disseminated guides for dealing with working conditions in front of computer screens (e.g. in Denmark, Spain, UK). Also radiation from screens is now under control in recent computers and is lower than the limit recommended by the World Health Organisation (WHO)<sup>25</sup>.

Nevertheless new surveys of computer work in Denmark such as NUDATA ([www.nudata.dk](http://www.nudata.dk)) show pain and inconvenience related to the time spent at a computer. Some approaches have been developed to prevent pain and troubles in relation to **monotonous work** in front of the computer (e.g. suitable variation of work, breaks, and well suited equipment and furniture as well as the employee being able to influence his/her own working situation).

**Council Directive 90/270/EEC** provides minimum safety and health requirements for work with display screen equipment. All Member States have already transposed this Directive into national legislation. The European Commission is presently assessing the need to update this Directive to take into account musculoskeletal and ergonomic difficulties and plans to launch a consultation with the social partners on this issue.

**2- On the psychological** front, ICT and the knowledge society is more generally associated with increased **stress at work**. One study suggests that between 1988 and 2000 the numbers of workers in France citing work as a source of pressure rose from 12 % to 40 %.

59% of Europeans working with a PC at work (or at home for work) consider that ICT use at work does not reduce stress in their jobs. Moreover, the strongest support with this statement is noted in those countries which have a high ICT use (and speak from experience), whereas countries with lower ICT use seem to feel less affected by stress.

While there is no hard evidence from the EuroBarometer survey, the underlying reasons could be attributed to a higher email intensity, complexity and variety of ICT applications in the countries with intensive ICT use by their employees.

Older age groups (40-51 and 55+) seem to suffer substantially more from ICT-induced stress than younger age groups (63-62% of older age groups respondents disagree with the statement that ICT use at work reduces stress in their jobs). Among the questioned professional and socio-economic categories, managers disagree most with this statement (64%). This could be partially attributed to their age category, but may also have more specific bearings on their professional activities.

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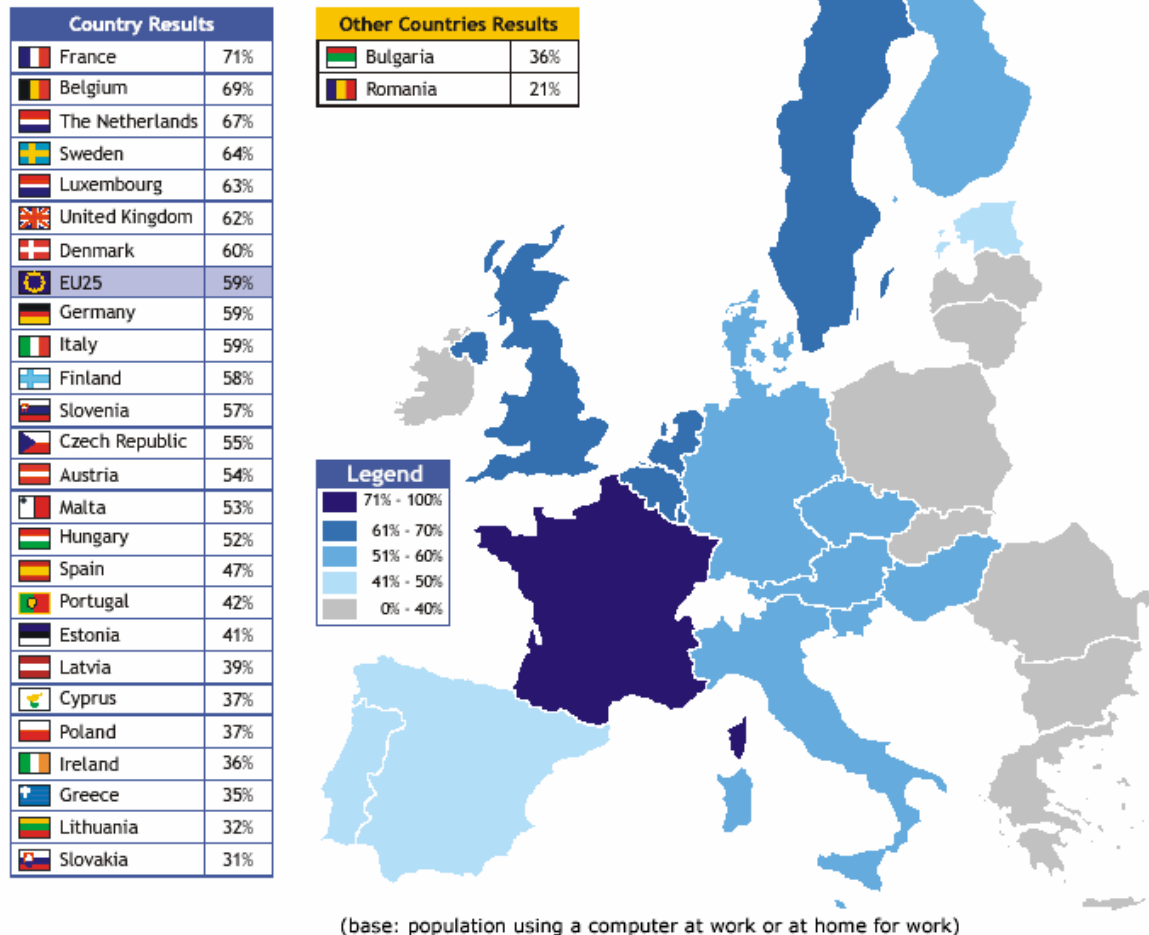
<sup>25</sup> The WHO recommends certain limits for employees exposed to radiation. Those are a starting point for the EU's regulatory framework concerning exposure to electronic fields.

Further indications for trends in particular for France are presented in the annex.

QE8.5 Could you tell me to what extent you agree or disagree with the impact of the use of Information and Communication Technology on your work?

Option: You have less stress in your job

Answers: Disagree



Source: special Eurobarometer 218 "ICT & the workplace" – Feb. 2005 – Fieldwork end 2004.

More specifically, ICT can lead to particular aspects of stress through e.g. increased work complexity and modification of work organisation and working conditions (e.g. with increased time pressure). Moreover, many companies have restructured and downsized their workforce, increasing their reliance on non-traditional employment practices that depend on temporary workers and contractor-supplied labour, and adopting more flexible and 'lean' production technologies.

Stress is in particular often linked to health problems in the cardio-vascular, gastro-intestinal and immune systems. In the 2000 European Working Conditions Survey, work-related stress was found to be the second most common work-related health problem across the EU15 (at 28%; only back pain was more common).

The European Agency for Safety and Health at Work has organised several events on this topic and identified causes of stress linked to the working environment.<sup>26</sup> The

<sup>26</sup> European Agency for Safety and Health at work; How to tackle Psychosocial Issues and Reduce Work-related Stress; Office for Official Publications of the European Communities, 2002



European Foundation for the Improvement of Living and Working Conditions also monitors on a regular basis the trends in the risks and consequences of work-related stress, and identifies how these can be prevented<sup>27</sup>.

Besides that the European Commission has presented a Green Paper "Improving the mental health of the population. Towards a strategy on mental health for the EU"<sup>28</sup>, for which the consultation is open till May 2006.

The EU-level cross-industry social partners aim through the already mentioned [framework agreement on work-related stress](#) to establish a framework within which employers and employee representatives can work together to prevent, identify and combat stress at work.

**Contact or call centres** can serve as a good illustration of stress at work when no reengineering with ergonomics expertise is undertaken. They are being established more and more in Europe and offshore. In 2000 it was estimated that in 2001 in Europe they would employ about 3% of the active population.<sup>29</sup> A 2004 study on the "UK Contact Centre Industry"<sup>30</sup> confirms that almost 3% of UK jobs (500,000 agent positions<sup>31</sup> or 750,000 employees) are in contact centres. In the UK, the contact industry is forecast to grow further to almost 650,000 agent positions by 2007, directly employing over 1 million people.

Some current trends can be identified concerning the situations in these centres. They provide in general services with different levels of added value from simple information, telemarketing to commercial relations and hot-lines and client support.

These centres have a huge turnover of employees (about 70%) during the first 6 months of employment. Due to the work organisation, very tough working conditions and limited professional perspectives, employees consider call centre jobs mostly as a short-term solution in their career development.

Nevertheless there are efficient solutions to improve the situation markedly with good longer-term planning as the following example shows.

**Introduction of a healthy and successful work organisation at a call centre (Stadtsparkasse, Hannover, Germany)<sup>32</sup>**

Psychosocial risk factors are common in call centres, as the work can be monotonous and demanding with little scope for control. The longer the time spent on the telephone, the more likely the occurrence of mental strain and in extreme cases burn-out.

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<sup>27</sup> <http://www.eurofound.eu.int/ewco/reports/NL0502TR01/NL0502TR01.htm> - "Work-related stress", European Foundation for the Improvement of Living and Working Conditions, 2005.

<sup>28</sup> COM (2005) 484 final of 14 October 2005. Further information is available on website: [http://europa.eu.int/comm/health/ph\\_determinants/life\\_style/mental\\_health\\_en.htm](http://europa.eu.int/comm/health/ph_determinants/life_style/mental_health_en.htm)

<sup>29</sup> D. Berard, Des relents de taylorisme; in: Travail et Changement no.260, Oct. 2000, ANACT, France

<sup>30</sup> <http://www.dti.gov.uk/ewt/contactind.pdf> - "The UK Contact Centre Industry: A Study" (May 2004)

<sup>31</sup> An "agent position" is a commonly-used unit of measurement in the contact centre industry, also known as a "seat". It refers to a single workstation, usually comprising of a computer linked via a network to the business's systems, a telephone/headset and the physical furniture required to allow the agent to work at the workstation. An "agent position" differs from a person employed in a contact centre: there may be more than one actual human agent per agent position, due to shift-working, part-time staff, management and support staff, etc.

<sup>32</sup> [http://agency.osha.eu.int/publications/reports/104/en/index\\_3.htm](http://agency.osha.eu.int/publications/reports/104/en/index_3.htm)

## **Solution**

A holistic approach was taken. The planning stage was based on quantitative and qualitative findings of a work assessment. This planning established the frequency and difficulty of various activities. A software tool was used to identify when stress may occur, so as to help plan work in advance. Work would then involve a mixture of easier and more demanding tasks, so as to keep mental demands at an appropriate level. Manufacturers of office hardware and software and furniture producers were consulted, as well as relevant trade associations. Staff was consulted once the call centre was set up.

The following organisational measures were adopted:

Participation: involving staff in decision making is very important. Assigning work resources is harmonised in cooperation with the staff council and workers;

- Job rotation: a system of rotation among staff at the same hierarchical level;
- Task completion: arrangements to ensure that a staff member deals with a case from the time it arrives at the call centre until a decision is taken on it;
- Scope: attempts were made to broaden scope as much as possible so that staff can choose which tasks to do and when, as long as there was an adequate number of staff. Staff were allowed a certain freedom in what they say: there are no scripts on the screen. They can also become product experts.
- Short break system: after every hour worked, staff can take a 10 minute break away from the screen and they are encouraged to leave their desk. This is to help reduce stress on voice and ears as well as giving a change in posture.
- Preventive measures include voice training, stress management and relaxation as well as improvements to the work environment such as air-conditioning, height-adjustable desks.

## **Results**

The preventive measures are considered to have been very effective. Use of the software tool and other prospective analyses did not show any indication of the effects of inappropriate strain or stress. After the call centre was opened, the measures were reviewed after three and then twelve months. No indication of increased stress levels or effects of inappropriate strain were identified. There is a high degree of job satisfaction and motivation. Commitment to the organisation is high. The economic success of the call centre is partly based on good working conditions.

## **Comments**

Stress prevention is 'designed in' at the planning stage in this intervention. This holistic approach tackles stress at work at a number of levels in this growing sector – from the physical environment (chairs, desks etc) to work systems. The results are then monitored to ensure their effectiveness.

There is good involvement from social partners and staff, once they have been recruited. The effort to make tasks more meaningful, for example, by employees following a case from arrival to decision, is commendable. The principles in this intervention can be transferred to other enterprises, and not just to call centres.

The example of the German Stadtsparkasse shows a potential direction for avoiding important risks due to the integration of ICT on workplaces and due to the resulting changes in work organisation. A further step has been taken by the German project Soziale Gestaltung der Arbeit in Call Centers (Social design of work in call centers) in preparing a social benchmarking tool.<sup>33</sup>

The International Labour Organisation (ILO) has also carried out work in this area<sup>34</sup>, looking at the impact of the introduction of ICT, including in countries outside the EU. It notes that changes in economic structures and technologies have created new hazards and

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<sup>33</sup> [www.soca-online.de](http://www.soca-online.de)

<sup>34</sup> <http://www.ilo.org/public/english/protection/safework/gender/womenwk.htm>

needs for different working populations. In industrial work, a large number of comparatively well-paid manual jobs held by men in industrialised countries have become low-paid, exploitative jobs for women in developing countries. This is particularly evident in the case of the micro-electronics industry where women are over-represented. These female employees are exposed to hazardous chemicals which have carcinogenic and mutagenic effects in the semi-conductor manufacture; many electronic assembly processes involve rapid, repetitive motions of the wrist, hand and arms which can provoke repetitive trauma disorders and other musculoskeletal health impairments<sup>35</sup>.

### 2.2.2 New opportunities for job quality

This section explores opportunities for improved job quality, in particular for the elder work force.

On the positive side, ICT can make work much safer by automating noisy or vibration prone workstations. As machines and computers take over, physical strength is less and less demanding for many so-called manual jobs, ranging from coal mining to steel production.

Among its main findings, the report '*Work organisation, technology and working conditions*'<sup>36</sup> states that the use of "new" technologies (in contrast to "machine technologies") is associated with fewer physical health problems, such as allergies/asthma, along with more skill demands and higher satisfaction with working conditions.

However the potential of ICT use goes far beyond these elements. Innovative ICT applications can considerably modernise the working environment.

In the EU Research and Technological Development programme on Information Society Technologies, the subprogramme "New working environments" conducts projects which contribute to developments in working environment design and organisation of work in the networked knowledge-based economy using ICT applications. The aim is to improve working conditions by facilitating creativity and collaboration and extended work opportunities for all. The focus is on the following areas:

- **eProfessions and eIndividual in work:** The accent is put on supporting the roles of e-workers (skilled and unskilled users ), e-professionals and knowledge workers aiming at a wide participation of all in the e-economy.
- **Collaborative eWork and work organisation:** The research focuses on the efficient use of ICT for organising and managing collaborative working environments, supporting knowledge work and decision making. This includes subjects like distance management, use of common virtual workspaces, communities of practice, and centreless work organisations.
- **Knowledge and capability management:** The research focuses on acquisition, sharing and retaining of knowledge and capabilities in multimodal and media-rich mobile working environments and networking of competencies to enhance the value of collaborative workspaces and multidisciplinary work.

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<sup>35</sup> Musculoskeletal disorders are health impairments caused by repetitive movements and inadequate work, force requirements, awkward and extreme postures, static positions or holding. Some of these ailments can result from an overuse or over exertion, such as in the case of a continuous exposure to vibrations or on the frequent use of typing or calculation machines. For a discussion on these disorders and an integrated approach to their control in the workplace, see: Cumulative Trauma Disorders, Current issues and Ergonomic solutions: A systems approach. K.G. Parker, H:R: Imbus. Lewis Publishers, USA, 1992.

<sup>36</sup> <http://www.eurofound.eu.int/publications/files/EF0205EN.pdf>

- **New work spaces:** The work concentrates on improving the user-friendliness of working environments improving the communication tools and the design of workplaces.
- **New organisation and methods of work in sectoral and regional settings:** The focus is on development, integration and demonstration of specific ICT solutions structured around either sectoral (e.g. health, customer relation, construction) or regional clusters.

Working situations can be improved with the high potential ICT applications represent. Nevertheless it is of utmost importance that the applications are well designed in an ergonomically sensible way, and that they are fully integrated into the working processes while taking full account of the way employees work (e.g. respecting their operational stereotypes).

A good practice example is presented in the following box.

#### **The positive experience of the enterprise Gabilly, France.<sup>37</sup>**

This very small enterprise (11 people), which is a producer of orthopaedic shoes introduced ICT in 1999 to increase its reactivity and productivity. The production of the Gabilly factory has to meet to high quality criteria and strict deadlines. The goals of the implementation were to facilitate enterprise organisation, to control better the costs and basic prices, to increase productivity, to adapt to new rules on working time, to reduce delays and stress suffered by the employees as well as to improve their skills.

#### **Approach**

Four new tools were implemented: an electronic data exchange system for order and payment management, an extranet for data and image exchange with subcontractors, an extranet between company and points of sale, and an integrated information management system in order to better track the product.

#### **Results**

Information exchange between employees, between the enterprise and the selling points and between the enterprise and the clients have been considerably improved with more comprehensive information. The execution times for payments (from 90 to 4 days) and production (from 6 to 2 months) have been considerably reduced as well as the responsiveness to demands. The clients are better informed about the status of the product in the production chain. The implementation of this system needed a redefinition of each post and adequate training. Through this approach each employee understood the importance and usefulness of the virtual data exchange and was motivated to use it in daily working life. The knowledge and skills related to production remained unchanged. For the employees there were less repetition, errors and time loss to find the right data and therefore stress was seriously reduced. Skills have been improved, the information is more complete and better shared. Each worker has a clear understanding of his role.

Productivity has been increased and emergency situations have been much better handled. Overall, the company has improved considerably its competitiveness.

These French and German examples show that a well conducted approach to **adapting workplaces** through the efficient use of ICT must be based on a thorough multidisciplinary diagnosis of the initial working situation and conditions, and the **analysis of user needs and the requirements of the enterprise**. In the planning phase, a **holistic view** helped to foresee changes in the workflow and their consequences to the initial situation, taking into account the changes on all levels (new competences needed, modified working procedures, new necessary assistance systems, and optimisation of the

<sup>37</sup> M. Denis-Gray Un grand pas du traditionnel à l'immatériel, in: Travail&Changement no. 260, Oct.2000, Agence National pour l'Amélioration du Travail, France

human-machine interface). The implementation and evaluation has been carried out in close interaction with the personnel concerned. In this way a sustainable solution has been found **improving the motivation and competencies of the employees** as a major factor for the productivity of the company. At the same time a considerable amount of stress has been prevented, with all its consequences for workers health and economic balance of the enterprise.

A specific way of reorganising work using the potential of ICT is **telework**. Its use and effects have been investigated in numerous research projects.

Telework offers many opportunities to improve the working conditions. The role of policy makers is to exploit this aspect of the information society, and to encourage this form of work organisation in such a way that flexibility and security go together and the quality of jobs is enhanced, and that also the opportunities for older and disabled workers on the labour market are increased.

As teleworkers are often working in places which are not tailor-made as workplaces a telework agreement has been reached on EU-level between Social Partners establishing a general framework to be implemented by its members in accordance with the national procedures and practices.<sup>38</sup> Still, the employer is also responsible for the protection of the occupational health and safety of the teleworker in accordance with Directives 90/270/EEC and 89/391/EEC and other relevant directives, national legislation and collective agreements.

In particular workplace health issues are clearly defined. The employer should inform the teleworker of the company's policy on occupational health and safety, in particular requirements on visual display units, while the teleworker should apply these safety policies correctly. The teleworker is entitled to request inspection visits.

Also the employer, workers' representatives and/or relevant authorities should have access to the teleworker's (tele)work-place, in order to verify that the applicable health and safety provisions are correctly applied, within the limits of national legislation and collective agreements, as well as the teleworker's agreement (if working at home).

In conclusion, when introducing ICT in the workplace and reorganising work it is important not to change only specific elements often conducted by a view of short term economic benefit but to adopt a holistic view that takes into account the whole working situation including the social elements and the balance with private life. Good examples exist and the elements which are transferable could be copied. Research and development projects have examined also the possibilities for improvement of working conditions.

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<sup>38</sup> [http://europa.eu.int/comm/employment\\_social/news/2002/oct/teleworking\\_agreement\\_en.pdf](http://europa.eu.int/comm/employment_social/news/2002/oct/teleworking_agreement_en.pdf)

### 2.2.3 Elderly workers and ICT use at work

The demographic developments highlighted in the 2005 Green paper on demographic change<sup>39</sup> reveals the potential of a more active and healthier older population in Europe. This has consequences for the ageing workforce. To keep older workers in work is not only important for employees and employers but also of benefit for the economy and society as a whole. Therefore, raising labour market participation has become a priority. To promote **active ageing** requires knowledge about the characteristics and requirements of older workers in order to rethink the way work is organised. This implies adapting work processes and tools to the changing age structure of the workforce as well as making working arrangements more flexible as the quality of jobs has an influence on the decision to stay in a job and in the labour market. For example the employment rate among older workers (aged 55-64) in Finland has increased rapidly in recent years (from 35% in 1995 to 50.9% in 2005). This rapid increase has been brought about in particular by paying attention to older workers' well-being in the workplace.

A particularly important issue in relation to technological change is the extent to which ICT used in the workplace are designed in ways that take into account the changes that occur with ageing. Both employers and the suppliers of workplace ICT have key roles to play in this. These issues are currently under investigation in EU research projects.<sup>40 41</sup>

#### 2.2.3.1 Characteristics of older workers' performance

One of the recent research projects for the EU Commission (empirica et al., 2005) shows that there has been a great deal of research on the issue of the relative decline of human performance with age (see for example, Griffiths, 1997),<sup>42</sup> but to date there has been insufficient attention given to the particular needs of older workers in relation to work design and organisation.

#### **Technology for adaptive ageing**

Topics that have been addressed in research on human performance include both physical performance indicators such as strength, speed, stamina and accuracy, and cognitive performance indicators such as memory, information processing, and ability to learn. It is important that many changes in functional capacity due to age can be accommodated in the workplace through redesign of jobs. Many are preventable and some are reversible. For example with increasing age people may experience declining short-term memory and a slower pace but, in an appropriate work environment and with a flexible workload and adapted tools they can maintain high productivity.

On the other side, older workers possess many strengths (like good cumulative long-term memory, long experience, good ability to perform accurate control tasks, a high level of dedication and well-developed abilities to evaluate issues and problems). Many types of work performance, especially in relation to more complex cognitive tasks and tasks that require complex social skills, may improve with age. As regards performance to learn, the available evidence suggests that older workers are well capable of learning new skills, including ICT skills, but they tend to learn differently and prefer different types of training and learning context compared to younger workers. In addition, they may sometimes be slower to learn but this may be compensated by ultimately learning better and making fewer mistakes (Czaja and Moen, 2004).<sup>43</sup>

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39 Green Paper "Confronting demographic change: a new solidarity between the generations" COM(2005)94 final

40 empirica et al., The Demographic Change - Impacts of new Technologies and Information Society. Final Report, 2005 – See: [http://europa.eu.int/comm/employment\\_social/social\\_situation/studies\\_en.htm](http://europa.eu.int/comm/employment_social/social_situation/studies_en.htm)

41 Active@work: [www.iccrs-international.org](http://www.iccrs-international.org)

42 Griffiths, A. (1997): Ageing, health and productivity: A challenge for the new millennium. *Work and Stress* 11(3), pp. 197-214.

43 Czaja, S. and P. Moen (2004) Technology and employment. In: *Technology for adaptive ageing*. National Academies. Online available at: <http://www.nap.edu/catalog/10857.htm>.

### 2.2.3.2 *The older worker in the knowledge society and support by ICT*

In the perspective of work-related trends in the knowledge society presented above workers as they grow older may find their working conditions worsening (about 20% of computer users at work in the EU are aged 50 and above). Especially long hours of work, the intensification of work, time pressure and information overload are less compatible with their needs and lifestyle (EWON, 2001)<sup>44</sup> and are likely to have negative implications (empirica et al., 2005).

Consequently in order to keep older workers in employment it is crucial to design and adapt ICT tools at the workplace to the workers' requirements. The 2005 research study by empirica specifies that in particular the following aspects need to be considered:

- **Accessibility and usability** of ICT for older workers
- **ICT-based assistive technologies** to support the ability of the older worker to carry out particular work task.

#### - Accessibility and usability of ICT for older workers

The interactions between age-related changes in physical and cognitive functions and more specific characteristics of ICT and ICT-based work are a central issue for the maintenance of the working capacity of older workers. This is an area that needs more research attention in the future.

ICT and ICT-based work have some specific ergonomic characteristics, including the use of visual displays and particular types of input device (keyboard, mouse, stylus and so on). Comfortable and effective use of ICT therefore requires adequate vision and dexterity as well as hearing when audio signals are important. The table below identifies a range of potential implications of changes associated with increasing age.

#### **Potential implications associated with increasing age related change**

Change / Impairment	Activity that may be impacted
Visual impairment	Reading of text, instructional manuals, computer screens Locate information on complex displays Perform tasks that involve fine visual discrimination Lighting requirements
Auditory impairment	Comprehension of synthetic speech Detection of audio signals or alerting sounds Speech communication (telephone or face to face)
Changes in motor skills	Tasks that require small manipulations (e.g. fine assembly work) Use of computer input devices (mouse, keyboard, etc.)
Changes in cognitive abilities	Learning new skills or procedures Recall of complex operating procedures or instructions Time-sharing; performance of concurrent activities Locating information on complex displays Performance of paced tasks

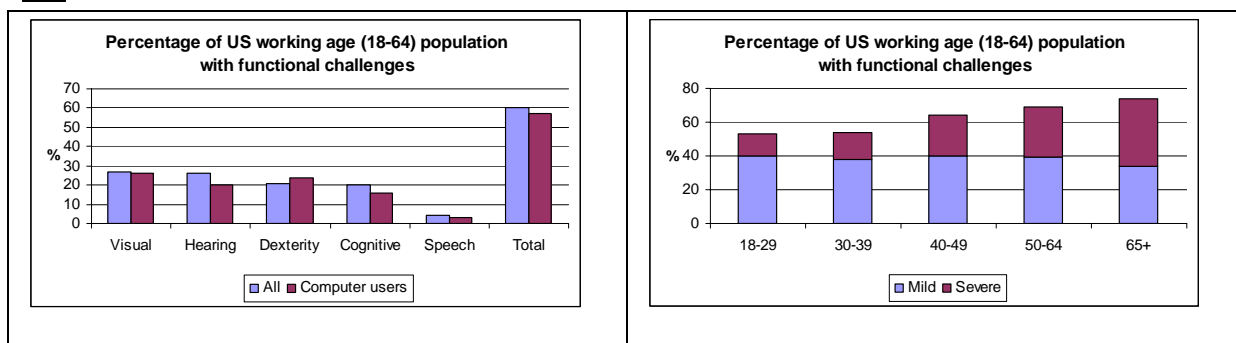
Source: Czaja and Moen, 2004<sup>45</sup>

<sup>44</sup> EWON (2001): Integration of the ageing workforce. Thematic paper presented to DG Employment and Social Affairs. European Work Organisation Network, November 2001. Online available at: <http://www.dwp.gov.uk/asd/asd5/rports2003-2004/rrep200.asp> (accessed August 2005)

<sup>45</sup> Czaja, S. and P. Moen (2004) Technology and employment. In: Technology for adaptive ageing. National Academies. Online available at: <http://www.nap.edu/catalog/10857.html>.

Available evidence on the prevalence of physical and cognitive difficulties among the population aged 50-64 years with respect to the overall population of working age in the US underlines the importance of this issue:

**Prevalence of difficulties with accessibility and usability implications in the US**



Source: Forrester Research / Microsoft Corporation 2003<sup>46</sup>

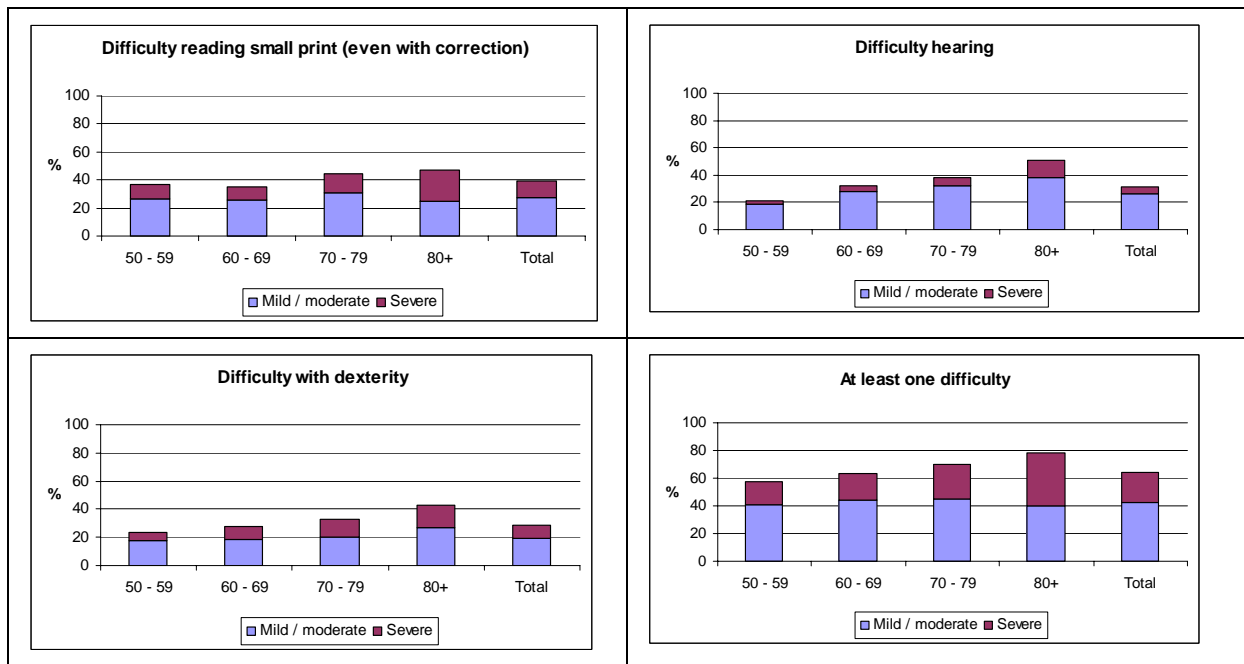
The prevalence of severe challenges increases significantly among older workers but many workers of all ages have at least slight difficulties. They would also benefit from more accessible and usable ICT designs. This indicates that important improvements of the working conditions could be obtained through a Design-for-All approach that aim to ensure that ICT is as accessible and usable as possible for the widest possible range of users in the widest possible range for contexts.

A survey undertaken by the EU R&D project SENIORWATCH that concentrated on the population aged 50-plus underlined the importance of giving focused attention to the accessibility needs of older workers. SENIORWATCH analysed the prevalence of different types of difficulties and found a prevalence rate of about 60% for physical functional difficulties among those in the 50-69 year age ranges.

<sup>46</sup> Forrester Research / Microsoft Corporation (2003) The wide range of abilities and its impact on computer technology. Online available at: <http://download.microsoft.com/download/0/1/f/01f506eb-2d1e-42a6-bc7b-1f33d25fd40f/ResearchReport.doc>.



## Prevalence of difficulties with accessibility and usability implications (EU15)



Source: SENIORWATCH 2002<sup>47</sup>

SENIORWATCH (empirica et al., 2005) concludes that there are significant age-related changes in physical and cognitive functions that can affect the accessibility and usability of ICT for older workers. However, not enough attention has been given to this issue in Europe, both by employers (in their purchase of ICT) and by the ICT industry (in the design and marketing of ICT).

An orientation to overcome this deficiency is provided by the Commission's eAccessibility Communication<sup>48</sup>, proposing the introduction of accessibility requirements for ICT in public procurement as a clear commitment to an inclusion policy that makes the products and services available to more users, citizens and employees.

### - Assistive technologies

Finally, in addition to new accessibility challenges, ICT also presents new opportunities. Assistive technologies, ranging from low- to high-tech devices and systems can both help to make ICT more accessible and provide supports for workers with physical or cognitive challenges in the wider aspects of their jobs. This is another area that has not yet received sufficient attention in research, policy or practice.

Data from the United States suggests that between 25% and 30% of workers with a functional difficulty need or would benefit from assistive technology in the workplace (Stoddard et al., 1998)<sup>49</sup>. However, levels of awareness and use of assistive technology solutions seem to be generally low:

<sup>47</sup> SENIORWATCH (2002): Older People and the Information Society.

<sup>48</sup> COM(2005) 425 of 13.09.2005 - [http://europa.eu.int/information\\_society/policy/accessibility/com\\_ea\\_2005/a\\_documents/cec\\_com\\_eacc\\_2005.html](http://europa.eu.int/information_society/policy/accessibility/com_ea_2005/a_documents/cec_com_eacc_2005.html)

<sup>49</sup> Stoddard, S., Jans, L., Ripple, J.M. and L. Kraus (1998): Chart Book on Work and Disability in the United States. An InfoUse Report. Berkeley, CA.

**Awareness and work use of assistive technologies by people with functional difficulties likely to affect accessibility (adults in the United States, aged 18-64)**

	Awareness %	Work use %
Alternative keyboards	31	1
Augmentative communication devices	14	<1
Braille embosser / printer	13	<1
Electronic pointing devices	32	1
On-screen keyboards	21	1
Reading tools	17	<1
Refreshable Braille display	8	<1
Screen magnifier	36	3
Screen readers	16	1
Sip-and-puff switches	10	<1
Speech-training software	16	1
Talking word processor	24	1
Touch screen/monitor	64	4
Trackball	46	4
Text telephone	24	<1
Voice recognition products	56	1
Word prediction programs	11	1

Source: Forrester Research / Microsoft Corporation 2003

The study by empirica concludes that assistive technologies, ranging from low- to high-tech devices and systems can help both to make ICT more accessible and to provide support 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 this is generally a very underdeveloped area.

The following key aspects should be addressed to optimise the opportunities and minimise the risks for older workers:

- Organisation of ICT-related work to suit the needs of older workers (“calmer” technologies and “calmer” work)
- Equality of opportunities in access to age-friendly ICT work
- Exploitation of ICT-supported opportunities for age-friendly flexibility in work
- Design of ICT to cater for age-related changes in perception, dexterity and cognition
- Exploitation of assistive technologies to support working capacity of older workers
- Equality of opportunities to acquire and maintain ICT-related skills and competencies.

## 2.3 Aspects of high quality jobs and services in the health sector

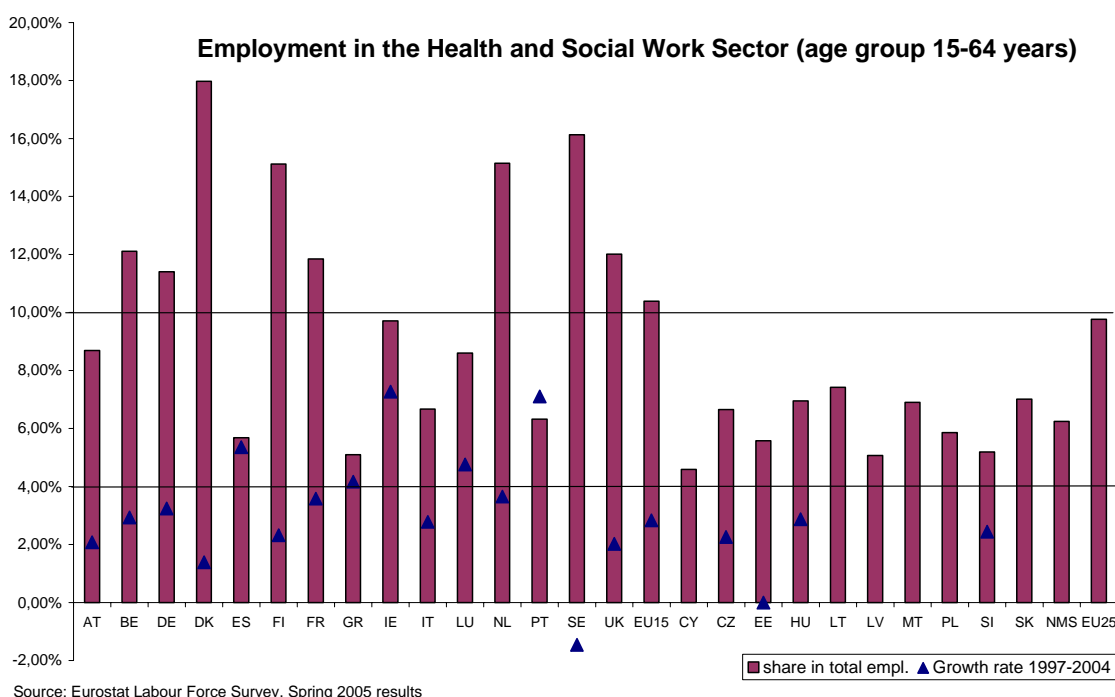
The health sector is an area with rapid employment growth which depends heavily on information systems opening up new opportunities. High qualifications among health professionals are an essential basis for good working conditions and at the same time for high quality health services. To obtain these qualifications, new skills are necessary essentially due to the use of new technologies.

### 2.3.1 Employment Growth

The healthcare sector has seen substantial growth in the past five years and is set to continue to expand as Europe's population ages. For example, the National Health Service (NHS) of the United Kingdom is the third largest employer in the world: in England and Wales around 1.3 million people are employed. This is around 2.5% of the population, working for the NHS.

Generally speaking<sup>50</sup>, health care and long-term care is **labour-intensive in skilled human resources**.

Health an important sector in employment terms within the overall economy. In 2004 it accounted for just under 10 % of all employment in the EU25. Wide differences exist between Member States: only 4.6 % of Cypriot employment is in health and social work; it represents 16.1 % in Sweden at the other extreme. In the new Member States the share of health and social work in total employment ranges between 4.6% (Cyprus) and 7.4 % (Latvia) of the total workforce (see table). The EU-15 saw employment in the "health and social work" sector<sup>51</sup> increase at an average annual rate of 2.8 % between 1997 and 2004. All Member States saw an increase, with Ireland experiencing the largest increase at 9,7 % per year.



<sup>50</sup> Communication from the Commission - *The future of health care and care for the elderly: guaranteeing accessibility, quality and financial viability*, COM(2001) 723 final

<sup>51</sup> Source: Eurostat Labour Force Survey, Spring results – latest available data: 2004.

Employment in the Health and Social Work sector (age group 15-64 years)					
Country	1997 (thousands )	2001 (thousands )	2004 (thousands )	Annual growth rates 1997-2004	Share in total employment in 2004
AT	:	301	323	2,08%	8,69%
BE	414	477	499	2,93%	12,11%
DE	3258	3654	3996	3,24%	11,41%
DK	443	466	486	1,39%	17,97%
ES	733	818	1008	5,36%	5,68%
FI	308	348	358	2,32%	15,12%
FR	2301	:	2878	3,58%	11,85%
GR	168	183	217	4,17%	5,10%
IE	116	143	175	7,27%	9,71%
IT	1232	1290	1472	2,78%	6,67%
LU	12	15	16	4,76%	8,60%
NL	966	1128	1213	3,65%	15,15%
PT	203	256	304	7,11%	6,32%
SE	762	782	684	-1,46%	16,13%
UK	2882	3022	3290	2,02%	12,01%
EU15	14079	15354	16871	2,83%	<b>10,39%</b>
CY	:	12	15		4,59%
CZ	266	291	308	2,26%	6,65%
EE	32	32	32	0,00%	5,58%
HU	224	239	269	2,87%	6,95%
LT	:	103	105		7,42%
LV	:	47	50		5,07%
MT	:	10	10		6,90%
PL	:	908	786		5,86%
SI	41	47	48	2,44%	5,19%
SK	:	146	150		7,01%
NMS		1834	1773		<b>6,24%</b>
EU25	:	17188	18644		<b>9,77%</b>

Source: Eurostat Labour Force Survey, Spring results.  
Last update: Wed Jul 27 09:01:17 MEST 2005  
Date of extraction: Fri, 5 Aug 05 05:41:34

### 2.3.2 ICT use in healthcare and skills needed

Healthcare is a **knowledge intensive sector**. Health professionals, from doctors to administrative managers, spend a large part of their time sorting through patient records, pharmaceutical registers, research publications and rules and regulations. Computers have greatly facilitated the retrieval and processing of such information but without high-powered digital skills these professionals cannot do their jobs efficiently. The effects which ICT has had in simplifying work routines are offset, in part, by the increase in the time spent on documentation, which involves a higher degree of standardisation.

82% of EU15 general practitioners (GPs) reported in July 2002<sup>52</sup> that they had at least one personal computer (PC) in their surgeries; 80% of GPs possessing a PC also had it connected to the Internet or to a dedicated medical network. When doctors used the

<sup>52</sup> EC, FLASH EuroBarometer 126 (June 2002)

Internet, this was mostly done in order to retrieve information for their continuing education (72%). More interactive services (exchange of opinions or patient data) were less popular (32% and 27% respectively).

ICT is also often related to specialisation of tasks and replacement of manpower by machines. Another aspect of ICT use in healthcare is **reordering of tasks**, whereby it is possible to bundle certain less complicated tasks to form a new job on a lower level. For example, certain tasks normally executed by a dentist can be done by an assistant. This can relieve the pressure on high-level workers in the health sector, so it is of great potential.

Entire areas of "traditional" healthcare have changed due to the use of information systems. Two examples illustrate this:

- Hospital laboratories are heavily computerised. Many forms of analysis, especially in biochemistry and haematology, are now fully automated. The sample is placed in the analyser and the result entered automatically into the laboratory information system. Nevertheless great differences exist in relation to the implementation of new technology: basic care often lags behind, for example.
- Prescription of medicines increasingly uses computer assistance for customised dosage and to avoid unwanted medical interactions. Computer aided diagnosis began 40 years ago and is especially useful when applied to rare diseases.

**Telemedicine** can make an essential contribution to **employability** as it helps to provide more and better health services and people to benefit from the new opportunities offered by ICT for traditional medical jobs, self-employment and new health professions (e.g. modern imaging techniques depend on information systems). Awareness and literacy in ICT are an essential form of training in this regard.<sup>53</sup>.

#### **Appropriateness of "teletriage" nursing advice**

Teletriage services are telephone help services operated by qualified nurses who provide health advice, self-care instructions and recommendations as to which types of health care should be accessed. Such teletriage services are often intended to enhance access to care, to help reduce unnecessary use of more costly services and to encourage self-care and informal care, especially where health care resources are scarce and access to care is inadequate. Thus teletriage services can be very useful for offering alternative or additional health services in remote or scarcely populated regions, where access to a doctor or a hospital nearby is often not guaranteed.

An audit of the appropriateness of "teletriage" nursing advice (based on tapes and records of 73 calls) assessed the appropriateness of the advice given by teletriage nurses in northern Ontario<sup>54</sup>. The service advised people with non-urgent problems. Callers spoke with a registered nurse, who provided recommendations for self-care or informal care or suggested to visit a family doctor, a walk-in clinic, or the nearest emergency department. Nurses also provided basic health information and information about prescriptions and over-the-counter medicines.

The audits were conducted independently by one family physician, one nurse practitioner and one registered nurse with teletriage experience. In 56% of the 73 calls, all three auditors judged the teletriage nurse's advices as "appropriate", and in 92% of the cases at least two of the three auditors agreed on the appropriateness of the advice. If the auditors did not rate the teletriage nurse's advice as appropriate, then they were about three times more likely to rate it as "overly cautious" (23 calls) rather than "insufficient" or "inappropriate" (8 calls).

There appears to be some tendency for teletriage nurses to err on the the side of caution when in doubt. The services was not acting as a "gatekeeper" and there was no pressure on the

<sup>53</sup> Final Report 01.04.2003 - [http://europa.eu.int/comm/health/ph\\_overview/Documents/hlch\\_health\\_telematics\\_final\\_report\\_en.pdf](http://europa.eu.int/comm/health/ph_overview/Documents/hlch_health_telematics_final_report_en.pdf)

<sup>54</sup> "An Audit of the Appropriateness of Teletriage Nursing Advice", John C. Hogenbrirk, Rammond W. Pong, Telemedicine Journal and eHealth, Volume 10, Number 1, 2004.

teletriage nurses to direct patients away from more costly services such as physicians or emergency services. The audit concludes that the teletriage service was providing appropriate advice in the majority of the cases, but the general validity of the results may be limited because of the small number of calls analysed.

The complex transition process of the health sector in the knowledge-based society requires rapid organisational changes (restructuring) and consequently continued updating of vocational skills (lifelong learning). eLearning will constitute a key aspect of obtaining skills in the sector and training will increasingly be delivered via on-line methods.

#### **2.4 Key messages by ESDIS**

- (1) Certain trends in new working methods and organisation using ICT show that there is a risk of negative consequences on job quality in particular in creating new work-related stress. Further investigations are needed in order to obtain a more precise picture and to advise on orientations to be taken.
- (2) ICT can have a high potential to improve working conditions. It is important to establish the link between policy requirements and research solutions.
- (3) The accessibility and usability of ICT at work for older workers need to be improved. Also the potential of assistive technologies should be better exploited.
- (4) In order to keep a high level of health care provision, personnel in organisations needs to be acquainted with and to master the appropriate ICT tools.

### 3 PART II. IMPROVED SOCIAL COHESION AND SOCIAL INCLUSION AND GREATER SOCIAL PROTECTION THROUGH EHEALTH

#### 3.1 Health in the EU and its determinants

##### 3.1.1 Health status of EU citizens

Life expectancy has been constantly increasing in the twentieth century. In particular, when the average life expectancy is calculated for the current 25 countries of the EU over the period 1970-2000, we see a steady increase for both men and women. Still, a broad bandwidth exists.<sup>55</sup> In all countries, women live longer than men. Variations in life expectancy exist between Member States. Especially if “healthy life expectancy” is considered, it is substantially lower in the New Member States (who joined the EU in May 2005). As people are living longer, mortality and morbidity are shifting towards increasingly older ages. Population ageing will impact on the morbidity pattern and needs for health care. Future trends in age-specific risks will be a key factor in the number of elderly people who will be in need of assistance and care.

##### 3.1.2 The social determinants of health and consequences for policy

Health developments are to a large extent determined by environmental as well as socio-economic conditions. In fact, **health is clearly related to socio-economic status**, and these are usually defined using a number of interrelated indicators, such as levels of education, occupational status, income and wealth.<sup>56</sup>

At the individual level, **education** appears to enhance social capacities, expand individual opportunities, build self-confidence and promote a healthier lifestyle, by increasing the awareness of risk. **Employment and unemployment** as well as levels of income are both important to health status; high employment rates, together with high average national wealth, are related to lower mortality rates. **Social support** is important for health and particularly crucial for good health at both ends of the lifecycle. Participation in formal and informal social networks (often used as an indicator of "social capital") contributes to protect and enhance the health of individuals. A number of serious and growing health problems relate to poor **lifestyles** in relation to nutrition, lack of exercise, abuse of tobacco, alcohol and illegal drugs.

The health status of citizens is an important factor determining the productive capacity of society. Health improvements can thus increase the potential for economic growth. However, as shown above, **inequality in health status is linked to wider inequalities in society**. Poor and excluded people are particularly affected by poor health. In policy terms, this means that **fighting poverty and removing barriers to access to health care systems are major health issues**.<sup>57</sup>

Health care systems play a crucial role in combating and preventing ill health. However, other policies, which affect the environmental and socio-economic determinants of good

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<sup>55</sup> See "How do we do; Health in the EU from a Dutch perspective" Van der Wilk EA, Achterberg PW, Mac Gillavry E, Zwakhals L, Van Linden F. - VWS, The Hague, 2004. See also the "Statistical Portariat: Demography, households & families" in "The social Situation in the European Union – 2003", publication by the European Commission.

<sup>56</sup> See "The social Situation in the European Union – 2003", publication by the European Commission

<sup>57</sup> ibidem

health, like employment, working conditions, and the promotion of higher levels of social inclusion, also impact significantly on the present and future health status of citizens. Only **a holistic approach, encompassing all health determinants as well as health care provision and modernisation of social protection systems can be effective** in guaranteeing the future well being of all EU citizens.

## **3.2 Challenges to Health and Health care provision in the Knowledge Society**

### **3.2.1 Health determinants in the Knowledge Society**

Social determinants of health can be directly or indirectly affected by changes brought about by the penetration of ICT use in a vast array of human activities, including modalities for establishing and entertaining relationships, for networking within local and virtual communities, for providing and receiving social support. The impact of ICT on **social capital**, a crucial health determinant, has been explored in previous work by the ESDIS Group<sup>58</sup> and is currently the focus of empirical research. The further link with quality of life, well being and ultimately citizen's health is open to dedicated analysis by the scientific community. Moreover, the **evolution towards a more cohesive or more polarised knowledge society** – also recently focused on by ESDIS – can influence the degree of inequalities and exclusion, which in turn has an impact on the health status of the population.

### **3.2.2 The demographic trends and their consequences**

The increased number of older people in the EU may increase the prevalence of morbidity patterns (relative incidence of disease) and long-term impairment. Moreover, according to Eurostat's forecasts for the EU25 the dependence ratio of older people (i.e. those aged 65 and over as a proportion of those aged 20-64) will rise from the current figure of 25% to 53% in 2050.<sup>59</sup>

**The ageing society brings major challenges for our society and public policies.** Increased threats associated with age are to be dealt with: physical and mental dependence, poverty, chronic and acute health problems, all conditions requiring a stepping-up in the provision of social and health care. At the same time, family and local community links are weakening and, in case of need, more people have to rely on professional support. In this context, the financial sustainability of public care systems is clearly at stake.

In an overall approach to the consequences of such demographic changes, it has to be borne in mind, though, that real solutions have to come from a holistic approach to ageing, which takes into account more elements than simply medical care and acute health/social care in the knowledge society.

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<sup>58</sup> “Building the Knowledge Society: Social and Human capital Interactions” - Commission Staff Working Document - SEC(2003)652

<sup>59</sup> Eurostat: Current and projected old age dependency ratio – See <http://epp.eurostat.cec.eu.int/>



### 3.2.3 Global and societal changes

Social demands have become more sophisticated and diversified in modern societies<sup>60</sup> and there is a growing concern for quality of life and the work-leisure balance. Individual choice has gained importance. The increased feminisation of the labour force is reflected in new social demands (e.g., for care facilities for children, elder adults and dependent people).

The mobility of both patients and health professionals has increased, challenging traditional models of health care provision. The management of large amounts of health information has become a crucial prerequisite for the well functioning of the sector. The increasing investment in technology is to be matched with wide-ranging organisational changes.

### 3.3 Facing the challenges: the role of eHealth

Modern health care is not provided by one single institution or by a single group of healthcare professionals.<sup>61</sup> New service models all put the patient at the centre of a network of service providers, forming “pathways of care” as the patient moves among institutions and care providers (“seamless care”, “shared care”, “tailored care”, “integrated care” “mobile care”, “home hospitals” and “customer centred care”). Such models all require access to patients’ health histories from any place and at any time, especially in emergency situations.

Modern information and communication technologies have a crucial role to play in enhancing the efficiency, quality and cost-effectiveness of the highly information-intensive health sector in the knowledge society. **The use of ICT to meet the needs of citizens, patients, healthcare professionals, healthcare providers and policy makers is referred to as eHealth.**<sup>62</sup>

#### 3.3.1 Information and Health

Three areas of eHealth which are deemed crucial for their potential impact in improving access and quality of healthcare, as well as sustainability of health care systems, have been selected here for a more in-depth analysis. These areas are: **eHealth home care and telemedicine tools and services for citizens, Electronic Health Records and online information services.**

#### 3.3.2 eHealth homecare and telemedicine

Many senior citizens become housebound and need services as well as support for medical self-management. eHealth can establish a continued connection to clinicians and contact with other patients.

eHealth can enhance the social inclusion of disadvantaged persons. It has the capacity to contribute to public health through better health surveillance. Moreover, eHealth applications allow patients to test specific conditions, such as blood glucose levels and respiratory rates or for using ECG e-devices in their own home. These applications can be referred to as patient self-management or telemedicine.

Homecare applications allow citizens who are receiving healthcare to be supported in their personal environment outside traditional healthcare facilities. Such telemedicine

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<sup>60</sup> See Joint Report on Social Protection and Social Inclusion SEC(2005)69

<sup>61</sup> See “Health Telematics Working group of the High Level Committee on Health: Final Report”- April 2003.

<sup>62</sup> See eHealth- making healthcare better for European citizens: an Action Plan for a European eHealth area COM (2004) 356 final

applications might include eHealth tools for the monitoring of conditions and treatments outside the traditional healthcare setting (e.g. pacemaker monitoring, remote ECG); eHealth tools for interactive diagnosis and support of citizens outside the traditional healthcare setting (e.g. dermatology, wound management) and eHealth for emergency and risk management (e.g. triage, accident and emergency management).<sup>63</sup> These tools and services can play a crucial role in **improving access and quality of care** for the increasing number of citizens affected by chronic and/or impairing diseases as well as for populations living in peripheral and remote areas.

ICT plays an important role in the development of home care for older persons and other target groups in the Nordic countries. In **Denmark**, the CareMobil project is aimed at supporting this development by creating new concepts and demonstrating the use and potential of ICT in caring for the elderly. In **Finland**, the ITSE project aims to improve independent living and communication among elderly and disabled persons by utilising assistive technology. (see Annex with good practices for further details)

### 3.3.3 Electronic Health Records

Integrated patient management aims to provide mechanisms for client case management and efficient sharing of information between care professionals, as well as with patients, such as the exchange of data (medical, administrative or financial) which is today a critical issue in healthcare.<sup>64</sup>

The cornerstone of a system for sharing information about patients between care providers is the electronic health record. Electronic health records open up new options for healthcare delivery: **better access** to relevant information, consultation and cooperation between healthcare providers, and monitoring and **care delivery** at the patient's home.<sup>65</sup>

In their simplest form, electronic health records are hospital records for a single inpatient stay or social insurance account records. However, in the future, they could also contain the entire history of an individual's interactions with the healthcare system. The electronic health record is widely cited as a critical key to modernising healthcare in the EU. It may save resources and effort by eliminating duplicate testing and the need for doctors to take down notes on a patient's history repeatedly.

The added advantage - since the advent of mobile communications - is that the data can be stored in one place (helping to ensure data integrity) but be accessed via wireless networks at another and thus cater to the needs of **mobile carers** (nurses and doctors making house calls) or telemedicine applications.

Ideally these electronic health records will be easy to use by different specialists, **easily accessible** (for example, via mobile devices and terminals) and ensure secure transmission of personal data. It is very clear, however, that technology is only part of the story: successful implementation of electronic health records also depends on the acceptance of the stakeholders involved and their willingness to alter their traditional way of working.

The Nordic countries are at the forefront of eHealth applications. The share of general practitioners using electronic health records is among the highest in Europe, and applications are generally well above the European average. Around 90 percent of

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<sup>63</sup> See "Health Telematics Working group of the High Level Committee on Health: Final Report" - April 2003

<sup>64</sup> See IPTS/JRC "eHealth in 2010: Realising a Knowledge-based Approach to Healthcare in the EU" Technical Report EUR 21486 EN – April 2004.

<sup>65</sup> See "Health Telematics Working group of the High Level Committee on Health: Final Report"- April 2003.

physicians in Denmark use electronic health records, and the use of ePrescriptions is well established.

**SPAIN:** "Health-Intercom, Definition, Development and Implementation of an Electronic Transmission System of Clinical Records between Health Information Systems" aims to define, develop and implement a system for the easy, rapid and reliable transfer of relevant clinical patient information between the different suppliers of health services. The project will define an electronic clinical summary record, as subset of the electronic clinical record - suitable for communication and use among the different professionals that take part in the care of a patient.

**BELGIUM (Flanders):** Kind en Gezin (children and health), a healthcare agency responsible for the health of children under 5 years old, organises a regional vaccination network, so as to increase the percentage of children vaccinated to 95% of all children. The Vaccination Database enables relevant professionals to access reliable data rapidly. The eHealth system was introduced in 1999 and resulted in a dramatic increase in the number of children vaccinated from 2000 to 2003. This developed into the Vaccinet system, which adds online vaccine ordering and stock control. Future plans include giving citizens online access to their records, using secure electronic identity cards. Apart from the clear benefits for children, their families and the health system, this also results in impressive economic benefits.

### 3.3.4 Electronic European health (insurance) card<sup>66</sup>

The Barcelona European Council of March 2002 approved the idea of creating a European health insurance card to replace all the paper forms needed for the reimbursement of health treatment while on a temporary stay in another Member State. This should facilitate the access to health services in the EU Member States. The card is not strictly speaking an electronic card but the decisions passed on June 18, 2003, include common specifications, in particular on the data set (information to be carried on the card, definitions of the fields), which will facilitate the phasing-in of an e-card. Furthermore, the Regulation aligning the rights and entitlements to healthcare includes a recital committing the EU to deploying an e-card on the basis of these technical specifications.

The first European health insurance card is initially aimed at replacing all the forms needed for temporary stays (travel, employees posted to another country (E128 form), international road transport personnel (E110 form), people studying in another Member State (E128 form), and people staying temporarily and seeking work in another Member State). It should facilitate the free movement and mobility of workers through the reduction of administrative procedures and easier access to health services. The card was launched in June 2004.<sup>67</sup> Twelve Member States deployed the card on the set date.

Additional functionalities may also be included on such cards e.g. medical emergency data and secure access to personal medical records.<sup>68</sup> Furthermore, the transition to electronic health cards including electronic services continues through pilot projects such as Netc@rds<sup>69</sup> with EU support (through the eTEN Community action programme) and in co-ordination with national initiatives.

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<sup>66</sup> See [http://europa.eu.int/comm/employment\\_social/healthcard/index\\_en.htm](http://europa.eu.int/comm/employment_social/healthcard/index_en.htm) for details

<sup>67</sup> [http://europa.eu.int/servlet/portail/RenderServlet?search=RefPub&lg=en&nb\\_docs=25&domain=Legislation&in\\_force=NO&year=2003&month=10&day=27&coll=JO&nu\\_jo=&page](http://europa.eu.int/servlet/portail/RenderServlet?search=RefPub&lg=en&nb_docs=25&domain=Legislation&in_force=NO&year=2003&month=10&day=27&coll=JO&nu_jo=&page)

<sup>68</sup> "Resolution of the Council (of the European Communities) and of the Representatives of the Governments of the Member States, meeting within the Council concerning the adoption of a European Emergency Health Card" of 29 May 1986 and the 13 May 1996 "Resolution of the European Parliament on the European health card" have as objective to protect the health of European citizens and to enhance their freedom of movement by providing a means whereby in an emergency their former and present health problems can be identified.

<sup>69</sup> This project involves Greece, Germany, Austria and France replacing the paper E111 and E128 forms by the electronic transfer of data. - <http://www.netcards-project.com/>

The European health insurance card is an important step forward in improving citizens' living and working conditions in the internal market. There are, however, further benefits that could be provided through electronic cards depending notably on technological possibilities, legal and political considerations and citizen acceptance.

### 3.3.5 Online information services and citizen empowerment

Citizens can be better informed by high quality health-related information services which can provide online access to health information and support communities on health-related services.

A promotional, cross-sectoral health and welfare policy can be effective in the long-term for promoting the **health potential of the population**. Prevention and early detection of disease are becoming an increasingly important aspect of health care delivery. In addition, individual citizens are expecting, and being expected, to play a greater role in ensuring their own well-being and are looking for high quality and reliable information on how to stay healthy, thus also contributing to the **sustainability of health care systems**.

This development can be supported by increased availability of reliable information online and through new types of interactive telematics services. Non-governmental organizations and the activities of self-help groups are important for this development. For citizens to be able to influence developments at the local, national and European level, solid information concerning health determinants and other health policy issues is needed.<sup>70</sup>

Official eHealth portals provided by national, regional or local health administrations can provide structured and quality-controlled access to a wide variety of health information and services. However, there are examples of so-called 'pseudo-official' portals, which can be financed by the government or national health system, but run by expert, non-governmental organisations.

The portals that are set up and run by private companies can be more or less open to the general public (i.e. some services being restricted to subscribers only). The main emphasis there tends to be placed on commercial, eCommerce applications and/or business-to-business eHealth content, rather than on population oriented eHealth services and tools. It is important to be careful, however, that patient empowerment does not contribute to encouraging overconsumption or inappropriate use of medicines or of medical services.<sup>71</sup>

According to a 2005 survey in Europe and the United States by the Health On the Net Foundation<sup>72</sup>, most non-professional and professional users of healthcare information favour academic/university sites (89.4% n=1403) and sites sponsored by medical journals (88.9%, n=1394), closely followed by government agencies (86.1%, n=1395). About 25% of a sample of 1,386 people from all over the world lack confidence in sites sponsored by pharmaceutical manufacturers and commercial, mainstream media organisations.

In terms of the actual content, while the first generation of eHealth websites primarily offered information and support, the next generation is offering more interactive features, **increased access to medical practitioners and direct service delivery**. Another relevant issue is the integration of telehealth and the Internet: the ubiquity of the latter

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<sup>70</sup> ibidem

<sup>71</sup> ibidem

<sup>72</sup> 9<sup>th</sup> "Health on the Net Survey of Health and Medical Internet Use" - <http://www.hon.ch/Survey/Survey2005/res.html>

has opened up new options for the former, not only concerning applications for professional users but also for the general public.<sup>73</sup>

Some concrete examples of implementation in Member States are presented in the Annex. The issue of accessibility, quality and reliability of online health information is crucial in this context.

*Web-based health information* has increased significantly in recent years. Many counties in **Sweden**, e.g. Stockholm and Östergötland, provide web-based information which is expanding rapidly. Through these websites, patients can contact health care providers, e.g. to renew prescriptions and make appointments. Another example of a website for health information is “Infomedica.se”, which is not driven by commercial interests, but by the county councils’ responsibility to provide citizens with reliable information about health and medical services.

### **3.3.6 .Empowering patients online**

Medical knowledge is becoming increasingly specialised and there is an inevitable ‘competence gap’ between medical doctors and their patients. Through online information sources, citizens can to some extent bridge this ‘competence gap’ by informing themselves about disease prevention and healthy lifestyles, various health problems and treatment options. This can have an empowering effect and allow patients to exercise a certain degree of choice.

Health-care related interactive groups - supported by ICT – can also alleviate the feelings of social isolation affecting many categories of patients and family carers. Not only do patients benefit from communicating and supporting each other, but they can also rely on the Internet as a means of exerting pressure on the authorities to take action about a particular situation.

## **3.4 State of play – enablers, barriers and risks**

### **3.4.1 State of play**

Over seventeen years of regional, national, an international research and development and funding for eHealth in Europe have resulted in a wide number of applications that have been implemented in several Member States. There are many good examples of eHealth initiatives at regional and national level across the EU (see Annex). They provide convincing evidence for the potential of eHealth in improving quality of healthcare, access for all and financial sustainability of health care systems.<sup>74</sup>

Most EU Member States have recently launched national and/or regional eHealth programmes, implementing eHealth as part of their general Information Society strategy. National Health related Internet Portals are currently offered by most national governments, smart cards for patients are being implemented by a number of Member States and the development of electronic health records, telemedicine applications, as well as the interoperability of digital health systems are focused on by certain Member States in specific projects.<sup>75</sup>

However, the degree, modalities, and therefore impact of eHealth implementation differ across Europe. For instance, only a few countries have a dedicated national electronic health network, connecting hospitals and general practitioners. Trustworthiness of information is a

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<sup>73</sup> See “eUser – Workpackage 1: Conceptual and Analytical Framework – part B”, by Kevin Cullen and Ivica Milicevic – Final draft, peer reviewed - June 2004

<sup>74</sup> See eHealth- making healthcare better for European citizens: an Action Plan for a European eHealth area COM (2004) 356 final

<sup>75</sup> See “eUser – Workpackage 1: Conceptual and Analytical Framework – part B”, by Kevin Cullen and Ivica Milicevic – Final draft, peer reviewed - June 2004

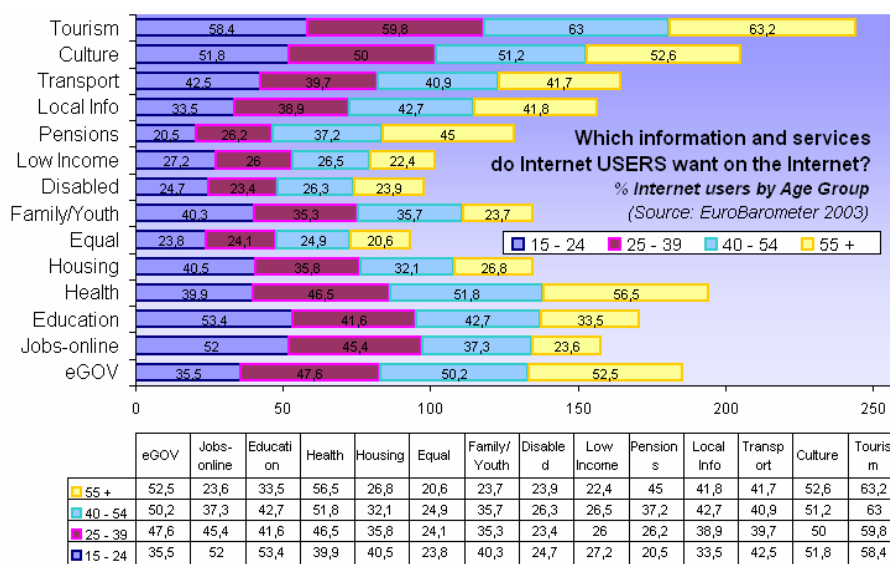
challenge, as are privacy and confidentiality issues. The general public tends to be sceptical about using smart cards, while healthcare professionals are hesitant about disclosing information on their activities. There is little involvement of patients organisations in eHealth (most developments are introduced via technology push) and there has been little research on the efficiency and effectiveness of ICT investment in healthcare.<sup>76</sup>

The eHealth impact study which is due to appear in early 2006 is a counterbalance to this, and a study on boosting and trusting in education in Europe is due to be provided in 2006. Various recent surveys have provided data on the use of the Internet to find health-related information and advice in EU countries.

Table 3-12. Results from surveys of eHealth activity in old EU 15 Member States

Source	Indicator	Question	Population	EU 15 Internet users %	EU 15 Pop. %
SIBIS GPS (Apr-May 02)	Usage of internet (for private purposes) to search for health-related information – last 12 months	...For your private purposes, have you used it [the Internet] in the last 12 months...to search for any health-related information?	Europeans aged 15+; Internet users are those who used Internet in last 12 months	36.4	19.8
Flash EB 112 (Nov 01)	Usage of internet (for private use) to seek health-related advice or information (no reference to time / ref. period)	For your private use, do you also use the internet to...seek health-related advice or information?	Europeans aged 15+; Internet users are those who personally use the Internet	33.2	15.9
EB 53.0 (Apr-May 00)	Usage of the Internet at home to search for information which concerns one's health - last three months	Used the Internet at home in the past 3 months...Searched for information which concerns my health	Europeans aged 15+; Internet users are those with an internet connection at home who use the connection	23	3.5

The use of Internet for Health related activities has been increasing over the last decade both as a percentage of Internet users and as a percentage of the whole population, while Internet use is growing as well.<sup>77</sup> EuroBarometer data from 2003 offer an insight on which information and services **users want** on the Internet. Health related contents seem to be one of the most popular topics in all age groups and especially for the 55+ (see table below).<sup>78</sup>



<sup>76</sup> See “Prisma Strategic Guideline 2 – eHealth”, by Andreas Ligtoet, Rand Europe – 2003

<sup>77</sup> See “eUser – Workpackage 1: Conceptual and Analytical Framework – part B”, by Kevin Cullen and Ivica Milicevic – Final draft, peer reviewed - June 2004

<sup>78</sup> See “eInclusion revisited: the Local Dimension” – Commission Staff Working Document, SEC(2005)206.

The 2003 BISER survey<sup>79</sup> shows that searching for information about specific medical matters was the most prevalent activity among Internet users in 28 regions of EU15. However, only over 6% of the same population reported having had an e-mail interaction with health professionals. The same survey indicates that usage of the Internet to order medications from online pharmacies was very low, with fewer than 1 in 10 users (0,8%).

Generally speaking, survey data offer a picture of **eHealth as a still emerging and growing service in Europe**. There are **barriers** and pitfalls to eHealth; implementation of new technologies must be accompanied by organisational change, and cross-organisational cooperation; internationally recognised technical, medical, ethical and legal standards must be adhered to and the systems must be reliable and interoperable, with transparent workflows.

### 3.4.2 Factors affecting usage of eHealth services

A number of **enablers** may facilitate the take-up of the new services by European citizens. Multiple factors can affect demand/usage of health care services, including the user's health status, the characteristics of the health system, psychosocial, socio-economic and socio-demographic factors.<sup>80</sup>

Attitudes, orientations, skills and knowledge (*psychosocial factors*) can strongly determine the usage of eHealth services. The individual's belief about their health and about who is responsible for maintaining it, a preventive orientation in terms of finding out about - and adopting - a healthy lifestyle, a reactive or proactive approach to health matters, are among the factors shaping eHealth usage patterns.

More importantly, levels of health literacy, general knowledge and skills (including digital skills) can have a determining impact on the decision to engage in the search for health information online - as well as on the degree of success of such activity, as it takes place. The ESDIS group has often – and also recently – focused on the digital divide issue and its consequences on social inclusion and cohesion. New technologies provide new opportunities for access to information, services and people around the world. Health information and services online can facilitate access to prevention and healthcare, and potentially extend it to disadvantaged and/or excluded groups. However, if exactly those groups are deprived of Internet access (over 50 % of the EU population still is; see figures here below<sup>81</sup>), do not possess the basic skills for information seeking on the Net, do not have a sufficient level of general and health literacy to be able to select or make use of the information available online, inequalities among citizens in the health care sector may be even deepened – the digital divide becoming a new form of “health divide”.

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<sup>79</sup> See BISER (IST-2000-30187) Domain Report No. 3 - Healthcare in the Information Society – the Regional Dimension

<sup>80</sup> “eUser – Workpackage 1: Conceptual and Analytical Framework – part B”, by Kevin Cullen and Ivica Milicevic – Final draft, peer reviewed - June 2004

<sup>81</sup> Source: Eurostat - Statistics in focus 18/2005 – "Internet usage by individuals and enterprises 2004"

Figure 3 - Use of Internet by sex and educational level, 2004 – EU 25\*, 2004 (%)

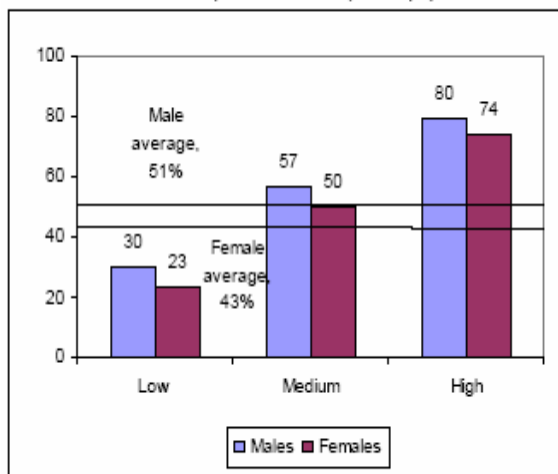
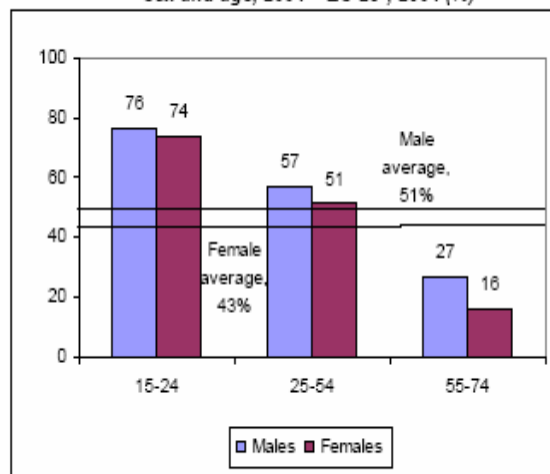


Figure 4 - Use of Internet by sex and age, 2004 – EU 25\*, 2004 (%)



Excluding BE, CZ, FR, IE, MT, NL, SK

Source: Eurostat - Statistics in focus 18/2005

*Demographic* (age and gender), as well as *socio-economic factors* such as education and income are recognised as extremely important in determining health related activities. People with higher levels of education are more likely to adopt proactive approaches to health management. People with lower levels of income experience health disadvantages throughout the lifecycle, including higher levels of morbidity and mortality at all ages (see also section 2.2 above). As such, lower income people might be expected to make greater use of the health services. However, this tends not to be the case, especially in relation to utilisation of specialist services. Despite their lower needs for such care, wealthier and higher educated people appear to be much more likely to see a specialist than the less well off.<sup>82</sup>

“Two possible hypotheses can be postulated in relation to the possible implications for propensity to engage in health-related activity online. On the one hand, lower income people, if they have Internet access, might be expected, all things being equal, to be more likely to seek information or advice online if there are barriers to specialist consultation and advice within the traditional health system. On the other hand, higher income people might have greater expectations and experience in relation to such information seeking and this might encourage more utilisation of the Internet for health-related matters on their part.”<sup>83</sup>

Public action - which aims at guaranteeing **access for all regardless of income and wealth** to health information and services, online and offline – should therefore concentrate on the following priorities in the knowledge society:

- ensuring accessibility of health resources through multiple channels, including the ones provided by new technologies; promoting health literacy across society; making available infrastructure and digital skills to all citizens, especially to the ones at risk of exclusion; ensuring compliance of health related sites with eAccessibility standards;

<sup>82</sup> See “eUser – Workpackage 1: Conceptual and Analytical Framework – part B”, by Kevin Cullen and Ivica Milicevic – Final draft, peer reviewed - June 2004

<sup>83</sup> Quoted from “eUser – Workpackage 1” - ibidem



- supporting control on the quality of information online; this can be achieved in different ways, such as setting quality criteria for web sites and promoting their application, as well as providing different forms of quality evaluation assistance for consumers.

### **3.4.3 Overcoming the barriers**

More generally, the challenges to a full implementation of *eHealth* can be classified as technical, social, economic and political. Not only are there many hurdles, but the players who must overcome them are also numerous. An effective *eHealth* strategy requires a coordinated political leadership, coupled with a commitment to making the financial investments needed.<sup>84</sup>

#### **3.4.3.1 Leadership**

*eHealth* investment is not at an optimal level, because the key players still need to be convinced about the cost benefits of the systems. Substantially higher investment is required if the real benefits of *eHealth* are to be reaped.

Until now *eHealth* applications have not been implemented on a large scale. Coordinated *eHealth* investment across regions and countries could achieve economies of scale and demonstrate the real benefits of *eHealth* investments.

A political and strategic leadership should :

- provide human, organisational and financial incentives for change
- establish effective partnerships with industry and cross agency policy collaboration
- commit adequate funds.

#### **3.4.3.2 Quality and Safety**

The consequences of poor quality *eHealth* applications are potentially lethal: a defective or poorly calibrated telemedicine tool, a wrongly executed decision support programme, and even inaccurate advice on a website, could all lead to serious injury or death. Quality and safety are as important in the *eHealth* sector as in any other sector of healthcare. To address the quality needs of *eHealth*, the European Union promotes:

- Commonly understandable quality compliance standards for health information
- Commonly accepted systems of accreditation and certification for devices and procedures<sup>85</sup>
- Interoperability standards, especially important for data sharing (e.g. electronic health records)

#### **3.4.3.3 Security**

In addition to the quality and safety of medical information, it is essential to guarantee data security, privacy and confidentiality. Health is one of the most data-intensive enterprises in the sphere of human interaction. Every medical interaction generates data which are stored in medical records and which must be treated as confidential. One of the great promises of *eHealth* is the fully shared and accessible *eHealth* record, shared within the limits of patient confidentiality. EC legislation on data protection paves the way towards harmonised privacy regulation across the Union. Efforts should now be made to ensure that medical privacy is interpreted and implemented in a consistent way across the Union.

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<sup>84</sup> See for this section “Mapping the potential of *eHealth* – Empowering the citizen through *eHealth* tools and services, by Petra Wilson”, Christine Leitner and Antoinette Moussalli (EIPA) – 2004

<sup>85</sup> Under the Programme of Community action in the field of public health (2003-2008) the Commission is also co-funding the development of a set of quality criteria for health related websites (‘webseals’), in order to increase transparency among health-related websites.

#### **3.4.3.4 Access**

Every effort must continue to be made to give as many European citizens as possible access to *eHealth* services. Access to web-based information must be made available in public spaces such as libraries, post offices and shopping centres, with respect for the privacy requirements inherent to sensitive information.

Having no personal Internet access should not preclude a European citizen from health-related information on the Internet. The content of Internet based information should be developed with accessibility in mind. There should be suitably adapted sites that provide for differing intellectual and physical capacities as well as particular community needs.

### 3.5 Key messages by ESDIS

- The overall health status of citizens is significantly shaped by socio-economic, lifestyle and environmental conditions. Inequality in health status is linked to wider inequalities in society. Only a holistic approach, encompassing health determinants as well as health care provision and modernisation of social protection systems can be effective in guaranteeing the future well being of all EU citizens in the knowledge society.
- Social determinants of health can be directly or indirectly affected by changes brought about by the penetration of ICT use in everyday life; dedicated research is needed to explore this specific link and analyze the impact of ICT related societal changes on the health of citizens in the knowledge society.
- Ageing leads to new challenges for public policies. Increased mobility of patients and health professionals, more diversified social demands, the weakening of traditional support networks, the need of managing larger amount of health related information, are factors requiring the development of new models of health and care (including informal care) provision in the knowledge society, putting the patient at the center of a network of service providers.
- Modern information and communication technologies have a large potential for enhancing the efficiency, quality and cost-effectiveness of health systems. This potential must be fully harnessed and barriers to its deployment removed. Online information services, homecare and telemedicine applications, as well as Electronic Health Records are considered crucial enablers for empowering citizens and supporting new models in healthcare provision.
- Different aspects of the electronic health card could be useful for citizen mobility. These functions should be thoroughly investigated and designed.
- eHealth is a still emerging, growing service in Europe. On one side, there are barriers and pitfalls to be overcome. On the other side, a number of enablers may facilitate the take-up of the new services by European citizens. Public action should aim at guaranteeing **access for all regardless of income and wealth** to health information and services, online and offline. ICT supported services should contribute to lessen existing inequalities in health and healthcare provision, offering new opportunities to disadvantaged groups and avoiding the risk of creating new exclusions.
- An effective eHealth strategy requires a coordinated **political leadership**, coupled with a strong commitment to the financial investments needed. Efforts in facilitating access and ensuring quality should be accompanied by strategies for removing barriers to data sharing, implementing interoperability, security, privacy and confidentiality.
- Finally, it is important to monitor the efficiency and effectiveness of ICT investment in healthcare.

#### 4 PART III: CONCLUSIONS BY ESDIS

- (1) Certain trends in new working methods and organisation using ICT show important opportunities but also some risks of negative consequences on job quality in particular in creating new work-related stress.

Therefore it is important to investigate further the exact reasons, interrelation between different factors, the situations, contexts and conditions of **ICT impact on job quality and working conditions**. This work could be carried out by the European Foundation for the Improvement of Living and Working Conditions taking into account the expertise of the European Agency for Safety and Health at Work.

- (2) The **potential** of ICT to improve the working conditions should be further investigated by:

- Defining policy requirements for further initiatives in Research and Development, application of the results and implementation activities
- Assessing and implementing of relevant R&D research results and testing of the most promising in regional and sectoral settings
- Analysing good practice examples in terms of their transferability to other contexts
- Identifying of missing tools for improvement of working conditions

Developing innovative applications combining technological and social innovations well adapted to the requirements and problems identified.

- (3) In order to maximise the opportunities and minimise the risks for **older workers** key aspects should be addressed concerning organisation of work and adaptation of the working environment:

- Organisation of ICT-related work to suit the needs of older workers (“calmer” technologies and “calmer” work);
- Improved opportunities in access to age-friendly ICT work;
- Exploitation of ICT-supported opportunities for age-friendly flexibility in work;
- Equality of opportunities to acquire and maintain ICT-related skills and competencies;
- The accessibility et usability of ICT at work for older workers need to be improved and the potential of assistive technologies should be better exploited. In particular;
- Design of ICT to cater for age-related changes in perception, dexterity and cognition;
- Exploitation of assistive technologies to support the older worker.

- (4) As healthcare providers depend more and more on information systems there is a need for **digital literacy** at all levels and in particular for the lower qualified personnel. Due to the rapid organisational and knowledge changes vocational skills need to be continuously updated. Well designed e-learning programmes could be an efficient tool to provide these skills.
- (5) Both the new characteristics of the ageing society and the development of the knowledge society create constraints and new possibilities for health services. **Public policy** needs to adapt models of health provision putting the patient in the center of a network of service providers.
- (6) Dedicated **research** is needed to explore further the impact of the Information and Communication Technologies use in every day life on social determinants of health.
- (7) Relevant actors should carefully investigate the different aspects (technological, legal, political, citizen acceptance etc...) for further improvements of **electronic cards** in the health sector.
- (8) Information and Communication Technologies have the potential for enhancing the efficiency, quality and cost effectiveness of health systems. The **barriers** for its efficient deployment need to be removed. The new services (like online information services, homecare, telemedicine applications and electronic health records) will then empower citizen and will support new models in health provision. This requires coordinated political leadership which should in particular for disadvantaged groups both
  - ensure access for all offering new opportunities
  - avoid the risk of new exclusions.

**ANNEX**  
**GOOD PRACTICES AND NATIONAL SURVEYS,**  
**PROVIDED BY ESDIS DELEGATIONS**

**I. NATIONAL EXAMPLES OF R&D OR GOOD PRACTICE PROJECTS**

**-Belgium**

- Telecare for elderly persons: Socio-economic analysis of the use of the videotelephony in the care for elderly people.
- Optimisation of the care mechanism for the patients of at home care with telematics application support

**-Germany:** the Electronic Health Card

**-Italy:** Advanced Health Process Management

**-United Kingdom:** The National Programme for IT in the NHS in England

**-Spain**

- -Promotion programme of technical research (profit) national information society programme
- -National Technology Programme of the Information Society 2004-2007 - Strategic Action Lines *eInclusión* and *eAsistance*
- -Projects PISTA-SANIDAD (Promotion and Identification of Emerging Health Services in the area of advanced Telecommunications)

**II. IT IN HEALTH CARE AND SOCIAL SERVICES IN THE NORDIC COUNTRIES (DENMARK, FINLAND, SWEDEN)**

- -IT strategies for health and social care
- -IT for specific groups
- -IT for communication in health and social care
- -Nordic co-operation in health care services

**III. OCCUPATIONAL HEALTH AND SAFETY ASPECTS OF WORKING IN THE KNOWLEDGE SOCIETY (SPAIN)**

**IV. NATIONAL SURVEY RESULTS**

- - on working conditions in France
- - on ICT use by practitioners in Belgium

## **I. NATIONAL EXAMPLES FOR R&D OR GOOD PRACTICE PROJECTS**

### **-Belgium**

The federal Services of Scientific, Technical and Cultural Affairs (SSTC) adopted a multi-annual programme of support for the development of the information society which covers the period 2001-2006 and which aims, through implementing projects, to stimulate the use of the ICT in targeted sectors.

Two projects financed under this programme concern the field of Health:

#### **1. Telecare for elderly persons: Socio-economic analysis of the use of the videotelephony in the care for elderly people.**

Society is confronted with the increasing ageing of its population, and consequently with the increase in public health expenditure. Bringing into play the new technologies connected with the information society within the framework of the care to the elderly people can at the same time optimise the organisation of the health care system and enable better management of expenditure.

During the first phase of the project, a test bench will be set up within the framework of the care area covered by the OCMW Kortrijk<sup>86</sup>, on the basis of the experience gained under the European technological research project "HAS Video". Within the framework of this test bench, several tens of users will be equipped with the devices necessary for a high quality video communication linked to the service centre, via a T.V. image. The principal objectives of the first phase are the setting up of the test bench, its operation and the study concerning the development of the care model.

The following questions will be considered: What is the place of the Telecare concept within the current system of care to the elderly people? What are the contents of the care which can be given? How to define the target group during the test phase and how to carry out the selection of the Telecare offer? Relevant is also the question of the efficiency - "outcome" - of this care system, i.e. of its contribution to better quality of life of persons requiring aid and care services, and the question of its cost.

The scientific support of the testbed will be ensured by HIVA (Hoger Instituut van de Arbeid) and will cover mainly the impact of these technological aids on the organisation and employment within the health care system. Other subjects of study will also be tackled:

- study of the report on effectiveness-costs of Telecare,
- feasibility study of its extension in the remainder of Flanders/Belgium,
- economic validation of the new financing mechanisms,
- decision variables and necessary conclusions for a large scale implementation scenario.

The final aim is to achieve a validated and reliable decision model, in order to be able to evaluate better the adequacy of these new technologies within the current health care system, and, more specifically, their financial impact under the currently recognised care classification.

The principal objective of the second phase is the consolidation of this concept to offer innovative services and the continuation of the development of the technology within the framework of first and second line care. The accent will be put on the refinement of the already made choices, according to the potential of transferability of the video telephony

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<sup>86</sup> OCMW = CPAS = Centres Publics d'Aide Sociale



in the sphere of the health care. Close attention will also be paid to the provision of "business flat", with the aim of proposing a new classification to the INAMI (national Institute of sickness insurance disability).

## **2. Optimisation of the care mechanism for the patients of at-home care with telematics application support**

This project pursues the following objectives:

- Development of telematic application for care at home. During the first phase, a telematic application is worked out around the monitoring of a therapy by infusions and by feeding via gastric tube at home, accompanied by the remote measure of the vital parameters. During a second phase, an application will be developed for the monitoring of the glycaemia and the automatic transfer of these parameters towards the electronic care file which can be consulted by the general practitioner.
- The development of the application goes together with a "research-action" on the question of knowing if telematics applications can constitute a relevant tool for the optimisation of the care of the patient. It will call upon a methodology of "constructive technology assessment" based on a right balance between technology and the user context representing the focal point. One aim is to study how to insert the use of technology in the context of care at home.

The target groups of the project are equally the patients, the at-home nursing services, the general practitioners and the technology developers. If necessary, the hospitals from which the patients come will also be taken into account.

The technological characteristics – the opportunities and constraints - will be analysed and will be described. An evaluation of the application will be carried out on the basis

- a) of the characteristics of the organisation of nurse work,
- b) of the possibility of mobilising the care personnel,
- c) of the attitude of the doctors and of the hospitals,
- d) of the organisation of at-home care in the region,
- e) of the quality of the care and
- f) of the attitude of the end-users (potential).

On the basis of the evaluation and of the analysis of the project, recommendations will be made concerning the introduction and the use of telematic application referred to above in at-home care in general. A list of criteria will be drawn up for the development of the project; it could be used for the introduction of the telemonitoring projects in at-home care. Among those, recommendations will be made for the deployment of an interactive evaluation process at the time of development and of the implementation of technology.

## **-Germany: the Electronic Health Card**

The future electronic health card can be considered as a perspective for good practice. The **electronic health card** of which the introduction is planned for 2006 is to replace the previous patient insurance card and should provide new patient-oriented electronic services of the health system: beside administrative functions health data of the card owner will be made available. The functions of the card are to be realised gradually. The **administrative part** of the applications of the card are the paperless transmission of a prescription and insurance specifications including data for additional payment status ; there will be a "European back" (their electronic version is already prepared) of the electronic health card, which facilitates the use of medical services in the other EU Member States. Besides that the **medical part** of the electronic health card offers auxiliary functions, which the card owner can determine. These are e.g. documentations of the medicinal products taken and emergency information such as blood group, chronic diseases, allergies etc. A usable electronic patient file can be constructed gradually through the functions of the electronic health card. The **advantages for the patients** are a better availability of important health data, so in many cases a qualitatively better treatment can be achieved. Besides that the patients receive a better overview on their own health status, as they have the possibility of reading and of printing the stored data themselves. Therefore, also the responsibility and the active participation of the patients are strengthened. **Advantages for the doctors** are in particular a quicker overview of the health status of the patient, the optimisation of working processes by avoidance of double investigations and the automatic transmission of data from and into own files as well as the improvement of communication and the easier use of special data banks and medical product information systems.

The introduction of the electronic health card is an important step on the way to the modernisation of the health service in Germany. The German working results can be a basis for Europe-wide arrangements for setting up interoperable services, applications and infrastructures. From the point of view of European integration considerations the mobility of citizens are supported, cross-border eHealth services are made possible and a common European eHealth-market will be created. Beyond that the project stimulates growth and job-creation in the health system and in the information technology industry and is suitable to contribute to the strengthening the knowledge-based society.

## **-Italy: Advanced Health Process Management**

At the Villa Beretta Hospital, an independent section of the Valduce Hospital (in the province of Lecco, North Italy) which is specialised in rehabilitation, a project called "Advanced Health Process Management" uses ICT for the assistance to disabled people.

Rehabilitation and monitoring technologies are more and more important for patient's care, in hospitals as well as at home. The project aims to introduce medical and managerial efficiency and effectiveness criteria in the field of rehabilitation.

The pilot project focuses on two distinct but interdependent phases:

- Firstly, of mostly technological nature, the devices and algorithms were elaborated and tested which allow the objective measurement of the contribution offered by the sanitary and non-sanitary staff on the individual rehabilitation tracks. The technology has to be simple and not intrusive, but precise -both quantitatively and qualitatively- with respect to data management, so as to allow for an adequate service of assistance.

The technology must also enable the collection of information from (even large) groups of people, as people with disabilities, in the hospital but also outside, can need

the assistance of more people, at the same time or at different times. The development needs to be towards the interaction with and integration within structures, within and outside the hospital, of integrated homecare, of personalised assistance.

- Secondly, at a more operational level, a Cost Management system was developed through
  - (a) Activity & Process Map: the mapping of macro- and micro-activities and the relative systemic relations within the rehabilitation track;
  - (b) Hospital Costing-Based System: the collection and elaboration of the information on the costs of the resources absorbed by the activities and on the value of the contribution to the rehabilitation track;
  - (c) Measurement Performance: the definition of the main performance indicators for each of the activities and of the individual processes.

## - **United Kingdom**

### The National Programme for IT in the NHS in England

The National Programme aims to improve patient choice and the quality and convenience of care by ensuring that those who give and receive care have the right information at the right time. It will help increase the efficiency, effectiveness and job satisfaction of staff who will be able to deliver higher quality, more timely, more convenient care to thousands of patients every day of the year.

A comprehensive review concluded that information systems to support the improvement of service quality must be a major feature of the changing health service over the next 10 years. Improving the quality of information and use of ICT is fundamental to the concept of integrated care, considering the needs of patients rather than institutions, introducing a ‘whole system’ approach to break down traditional care boundaries and delivering an integrated system.

Only when such an infrastructure is in place is it possible to invest fully in applications with the potential to improve the quality, safety and efficiency of the service. The National Programme for IT was established as a direct response to this review, and to establish an ICT infrastructure that aims to:

- provide a higher quality service for patients with better coordination of care;
- enable health care professionals to spend more of their time directly with patients by reducing the time spent on administrative tasks and record keeping and helping them to work from various locations;
- ensure more efficient use of resources, including better coordination between primary and secondary care, electronic booking of treatment and savings in transaction costs;
- improve clinical governance and safety through access to medical records from all locations, ‘real time’ sharing of medical information, keeping medical staff up-to-date with latest developments, prompting recommended care paths and safer prescribing; and

The key elements of the National Programme for IT comprise:

- **The NHS Care Records Service (NHS CRS)**, providing an individual electronic NHS Care Record for all England's 50+ million patients, securely accessible by the patient and those caring for them. The Care Records Service will be the lynchpin of the new systems and services.
- **Choose and Book**, an electronic booking service offering patients greater choice of hospital or clinic and more convenience in the date and time of their appointment.
- **Electronic Transmission of Prescriptions (ETP)**, will allow prescriptions generated by GPs to be transferred electronically from their surgeries to their local pharmacies, thus making prescribing and dispensing safer, easier and more convenient for patients.
- **A new National Network for the NHS (N3)**, providing reliable supporting IT infrastructure and broadband connectivity to meet NHS needs and to provide networking services.
- **Picture Archiving and Communications Systems (PACS)** to capture, store and distribute static and moving digital medical images (such as electronic x-rays or scans), allowing for a near filmless operation, enabling clinicians and care teams to view common information.
- **QMAS – the Quality Management and Analysis System** is a web based tool that provides GP practices and primary care trusts objective evidence and feedback on their quality of patient care.
- **Contact** – a centrally managed, secure, clinical email and directory service provided free of charge to NHS Organisations in England, secure enough to allow patient information to be transmitted through electronic means.

Once installed, the new IT infrastructure and systems will connect more than 100,000 doctors, 380,000 nurses and 50,000 other healthcare professionals; benefiting more than 50 million patients in England.

For further information see the 'Connecting for Health' website: [www.connectingforhealth.nhs.uk](http://www.connectingforhealth.nhs.uk)

## **-Spain**

### **Promotion programme of technical research (profit) national information society programme**

Projects related to the area of Health supported in the call of 2003 of the National Programme of the information Society, managed by the Secretary of State of Telecommunications and of the Information Society.

#### **1. Development of a system for the integral management of requests of reports in health networks**

The project will offer a management system for the realisation of requests (diagnostic and clinical) and distribution of reports within the health networks, that is going to allow interconnecting medical services for autonomous communities or given geographic areas.

#### **2. Development of software and integration of hardware into a system of virtual reality applied to the diagnosis and treatment of the chronic upheavals of agoraphobics**

The aim of the Project is to use new IS Technologies in the field of Mental Health, in such a way that Virtual Reality (Therapy of Exhibition of Virtual Reality: TERV) contributes to the recovery of the most complex and incapacitating Phobic pathology (Agoraphobia) in lesser time, and with the less possible emotional and economic cost.

#### **3. Telemedicine for centralised multidisciplinary public health management**

Preparation of a Platform of Information and Follow-up Systems that manages the Social welfare Process and Telemedicine applied to Multidisciplinary Public health Residences for a correct follow-up and prevention of the patient that includes the collection, preparation, analysis and transmission of the information necessary to organise health services and make them work in an efficient and effective way.

#### **4. Information system for a digital social welfare network (RAD)**

The purpose of this project is to create a digital social welfare network (RAD) that provides advanced services, based on Information Systems to the health centres. Services will pay special attention to the chronic patients including transplantation activities.

#### **5. SISTAO : development of a system of information and telecommunications for the management of oral anticoagulant therapy**

The development of an advanced ICT system tackles the management of the health monitoring process of patients receiving treatment of Oral Anticoagulant Therapy, using the last Internet and mobile communications technologies.

#### **6. AZAHAR : technological environment of support integrated to the social assistance infirmary process under conditions of intra and extra hospital continuity, through wifi accessibility and digital coding of the care plans**

The development of a pilot experience, based on the use of wireless communication systems of last generation (e.g. WI-FI), applied to the hospital environment, for the online management of the clinical patient information by the health personnel.

#### **7. System based on neural networks and advanced information technologies for follow-up of the change in transplanting of osea marrow**

Its aim is to implement different intelligent models that permit identifying different types of treatments for haematological cancer according to the psychosomatic type of each patient.

## **8. Management of safety in the access to clinical information through the use of smart cards**

The project aims to define and implement a scheme of access control to clinical information based on the use of smart card.

## **9. Management of the mobility of the health personnel in assistance processes in hospitals**

The project confronts the problem of the mobility of the health personnel of the hospital to the automation of the assistance processes through an information system.

## **10. Prototype of increased reality vision in operating theatre**

The aim of the project is the development of a prototype of Increased Vision of Reality in the Operating theatre to help effectively in the planning and realisation of operations.

## **11. SIGSS**

The aim of this project is the development of a system for management assistance aiming at the daily management of information on the patients, resources, personnel and fleet of cars and/or ambulances of a company or organisation of public health assistance, based on a Geographic Information System personalised for the area of action and fed with data coming from GPS and a GSM communication system for the two-way exchange of information through SMS messages.

## **National Technology Programme of the Information Society 2004-2007**

### **Strategic Action Lines *e*Inclusión and *e*Asistance**

The strategic action lines "e-inclusion and e-assistance" aim to promote the creation of ICT solutions aimed at less-favoured groups and with specific needs of permanent, chronic or temporary character, in order to reach maximum social and geographic cohesion. Among the projects supported in 2005:

#### **– Telematics Social Welfare Service for Health (Elder & Life):**

Project begun in 2004 for the development of a prototype for location and transmission of vital signals intended for greater groups of people. The project Elder & Life has been final of the prizes IGC 2005 that took place in Barcelona June last 9 2005.

#### **– Advanced Integral Assistance System for Independent Living**

The aim of this project is the creation of a new generation of tele-support systems allowing residents of sheltered housing units a greater autonomy in the activities of their daily life. The system has a clear vision of integration of different types of services that are considered of high interest to reach that aim (Tele-help 24h/24h, telemonitoring, videoconference, user information, occupational therapy and information to relatives).

#### **– Health-Intercom, Definition, Development and Implementation of an Electronic Transmission System of Clinical Records between Health Information Systems**

Its aim is to define, develop and implement a system for the easy, rapid and reliable transfer of relevant clinical patient information between the different suppliers of health services. The project will define an electronic clinical summary record, as sub-set of the electronic clinical record - suitable for communication and use among the different professionals that take part in the care of a patient.

## **1. Electronic prescription**

Pilot project for for the introduction of the electronic prescription in different Health Services, as prescription document, dispensation, control and exchange of information among the Health Systems and the pharmacies. Medical follow-up - health of the patient.

The aim of this project is the start-up of a System of electronic prescription and pharmaceutical management allowing for programming the process prescription-dispensation.

This project finished in a very satisfactory way in 2002, with the collaboration of the Council of Health of the Community of Madrid, Council of Health of the Government of the Canaries, Council of Health of the Basque Government, and Catalan Health Institute of the Catalan Government; as well as other organisations like the Council of Colleges of Pharmacy and the College of Pharmacy of the Community of Madrid.

## **2. Electronic prescription II (currently in procedure phase)**

This initiative complements the project of Electronic Prescription finished in 2002, promoted by the Ministry of Science and Technology and the Ministry of Health and Consumer Affairs. It implements of the Electronic Prescription II project in the Autonomous Communities, to integrate all the agents of the Social welfare Health Network, Doctors, Pharmacists, Inspectors Visitors, Central Services etc with the aim to give a better service to the citizen.

Taking as a basis the developed implementation, various applications are going to be integrated, following the different aspects of the Network of Assistance: primary attention, specialised attention, pharmacies, central services, health card that will give new functionalities to the system and will rectify the errors detected in the initial phase.

The objective is to constitute a true health network in which all the agents involved will be able to interact in the processes previously mentioned. The content of the prescription should adapt to the pathology to which it is addressed, thus promoting quality in the prescription. The final aim is to obtain that the dispensation of the medicine is made in the surest and most effective way.

The project has a special impact on the population, by the facility and comfort it provides to all those implied: doctor, patient, pharmacist, as well as by the control of the pharmaceutical expenditure.

The Autonomous Communities that are going to take part in this project are: The Balears, La Rioja, Murcia, Catalunya and the Independent Cities of Ceuta and Melilla, through its Councils of Health and the Pharmaceutical Colleges.

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<sup>87</sup> PISTA = Promoción e Identificación de Servicios emergentes de Telecomunicaciones Avanzadas - Sanidad = Health. PISTA-Sanidad = Promotion and Identification of Emerging Health Services in the area of advanced Telecommunications.

## **II. IT IN HEALTH CARE AND SOCIAL SERVICES IN THE NORDIC COUNTRIES (DENMARK, FINLAND, SWEDEN)**

This chapter is mainly an extract of the report “Health and social Sectors with an "e", a study of the Nordic Countries”<sup>88</sup>. From an international perspective, the Nordic countries are at the forefront regarding the use of IT and the Internet.

### **IT strategies for health and social care**

Strategic plans and proposed activities for IT development in the Nordic health sectors have many components in common. Increasing shared information is an overall goal, which implies activities related to electronic patient records (EPR)/electronic health records (EHR), security, telemedical consultations, classification and standardisation, regulation, and web-based services. Strategies at the national level are developed and implemented in different contexts within the Nordic countries since the countries differ in terms of their responsibilities at the state, regional, and local levels.

**In Sweden** the counties are relatively independent and have developed strategies for their IT work and co-operate on a voluntary basis. The counties, municipalities and the private caregivers also co-operate on a voluntary basis through Carelink, a national network organisation established to develop the use of IT in health care. Activities within this co-operation are for example further development of Sjunet, the national communication network for health care, and development of common IT solutions. Focus in the counties is also the development and use of telemedicine<sup>89</sup>.

**In Denmark**, MedCom was initiated in 1994 by the Ministry of Health to increase electronic communication. In 2003, the current strategy was launched, i.e. “National Strategy for Information Technology in the Health Care System 2003-2007”. The overriding aim of this strategy is to assure that shared information becomes the foundation for seamless care and patient involvement. A Basic EHR structure has been agreed upon as the common national information structure for all future IT systems holding clinical data in the Danish healthcare sector. Major initiatives for the next years include a national terminology server and organisation, further development of the Public Health Portal, and a registry based on 'Clinical Process' and continuity of care.

### **IT for specific groups**

IT can benefit citizens with specific needs. Examples of where these needs have been the starting point for reforming work processes and developing new, IT-based services are: IT to enable care in the home, IT to improve services for children and adolescents at risk, and IT to improve e-inclusion of socially excluded groups.

#### **- Home care**

Home care for the elderly and other target groups is undergoing further development in all Nordic countries, and IT plays an important role. In **Denmark**, the CareMobil project

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<sup>88</sup> <http://www.norden.org/pub/sk/showpub.asp?pubnr=2005:531> - TemaNord 2005:531

<sup>89</sup> Telemedicine : "The practice of health care using interactive audio, visual and data communications. This includes health care delivery, diagnosis, consultation and treatment as well as education and transfer of medical data" (WHO)



is aimed at supporting this development by creating new concepts and demonstrating the use and potential of IT in caring for the elderly. In **Finland**, the ITSE project aims to improve independent living and communication among the elderly and disabled by utilising assistive technology.

In **Sweden**, home care for the elderly and others dependent on care in the home is an important field that receives growing attention. Several projects have been initiated in recent years aimed at developing models and work processes for elderly care, where securing seamless care and co-ordination between organisations are essential. The ACTION project is an example of a project that focuses on support for patients' families.

#### - Children and adolescents at risk

Children and adolescents at risk are the focus of an eGovernment project in **Denmark**. The background is that expenses for prevention and the placing of children have increased substantially in recent years. However, there is insufficient information about causes and about the results of interventions. The aim is to improve management and case processing via, e.g. more systematic processing routines, better matching between the needs of the children and the interventions used, a better management information system, and easier inter-agency co-operation among public authorities.

#### - Groups at risk of social exclusion

In **Denmark** all home pages of public organisations undergo an annual quality check to ensure that public electronic information is easily accessible in terms of both form and content. One example of a project is the "Solicom IT project" aimed at giving "socially excluded" groups, including refugees and immigrants, a chance to submit proposals for initiatives and explore the possible use of IT. The project surveyed socially excluded individuals and groups, and their responses provided the basis for activities. The project has been widely disseminated in Denmark and was also diffused in Germany and Italy.

In **Sweden**, a major information campaign has been carried out for promoting an information society for all. Responsible actors are the Swedish Handicap Institute and the major user organisations for people with disabilities. The focus of the campaign is Accessible Internet. Campaign activities are directed towards Information Technology designers, but also towards politicians and the general public.

Many project in **Sweden**, within different research programmes, focus on people with special needs, such as elderly, mentally and physically disabled and chronically ill. One example from the county of Västerbotten is the TILLIT project (Taking care of Life situation and Life quality of the individual through information exchange and quality – social technology for an independent life of elderly and disabled). The purpose of this project is to increase safety and quality of life for people who need support from both municipality and county, through improved communication between the caregivers. The project has developed a database, which functions as an information forum where different caregivers can communicate.

#### **IT for communication in health and social care**

The Nordic countries are at the forefront in eHealth applications. The share of general practitioners using Electronic Health Records (EHR) is among the highest in Europe, and applications are generally well above the European average.

In **Sweden**, Sjunet is used for healthcare communication across organisational boundaries, for example between counties or between different caregivers within a

county – such as between a hospital and a municipality or between a caregiver and a pharmacy. Through Sjunet separate organisations can communicate across administrative borders. Services can be found within the field of telemedicine, including the secure transmission of patient information, clinical rounds and collaboration between hospitals. Many prescriptions are being transmitted electronically to pharmacies, through Sjunet.

In Sweden the share of e-prescriptions of first-time prescriptions was 27 percent in May 2004, but there are large regional differences. Some counties report only a few percent while others report over 90 percent. In addition, Sjunet is also used for IP telephony, file and media transmissions, and access to knowledge databases. Another application involves quality registers, for example, RIKS-HIA (Register of Information and Knowledge about Swedish Heart Intensive care Admissions), a register that includes data on patients in cardiac intensive care.

**In Denmark** e-prescriptions and communication between municipalities and countries in the healthcare process are common. Around 90 percent of the physicians in Denmark use electronic health records, and the use of e-prescriptions is well established. Nearly all hospitals use the national health data net, and four counties use web-based x-rays in communication between general practitioners and specialists. Six counties have teleconsultations between general practitioners and specialists in dermatology. A national web-based service has been established where general practitioners can order test results from laboratories throughout the country.

Four project areas are further developed under MedCom IV:

- The Internet Strategy, the purpose of which is to introduce a nation-wide, Internet-based health care data network and achieve large-scale use of web lookup, telemedicine, and other Internet-based forms of communication in the health care sector.
- The Local-Authority project, the purpose of which is to achieve large-scale use of MedCom's standards for communication between hospitals and home care provided by local authorities.
- The XML-EPR Communication project, the purpose of which is to achieve large-scale, nation-wide use of all relevant MedCom messages for communication internally in hospitals and between hospitals.
- MedCom's SUP project, the purpose of which is to achieve Internet access to Patient Administrative Systems (PAS) and EPR patient records both within a county and across county boundaries.

In **Finland**, a decision was made in 2002 that electronic health records should be used throughout the country by 2007, through compatibility among existing systems. Most Finnish hospitals have limited functionality in EHR. Based on the results of a pilot project, the use of electronic prescriptions should be extended to other regions. Teleconsultation is widely used between hospitals and healthcare centres in the regions. Many applications are in use (e.g. teleradiology, telepsychiatry, teledermatology, teleophthalmology). A new application is the consultative and interactive referral between GPs and specialists.

### **Nordic co-operation in health care services**

The level of co-operation in the Nordic countries is important to the development of health care services in these countries, and they benefit from collaboration and the exchange of experiences. Some examples of Nordic co-operation include:

- the KITH project, where MedCom and Carelink work on connecting the three national networks and thereby create a Nordic Healthcare Net (NHN).

- the Nordic Centre for Classifications in Health Care which was established by the Nordic Council of Ministers, and is responsible for collaboration between the Nordic countries and international representation of these countries in the field of healthcare classifications;
- the Harmonisation of EHR Architecture (HC Interest) which develops the basis for a common Electronic Health Care Record in the Nordic countries;
- the Collaborative Network of Nordic eHealth Competence Centres with participation from Carelink (S), MedCom (DK), KITH (N), STAKES (SF) and Ministry of Health/University Hospital of Reykjavik (ISL) which meets twice per year to exchange lessons and experiences within this field

Nordic co-operation is expected to increase in the future as regards IT in health services. The Nordic countries have reached a stage where the national level of development in this field has extended to a Nordic level. The Nordic health care network opens new opportunities for a Nordic market of health services, which will further enhance the need for Nordic collaboration. Therefore a suitable organisational structure with the appropriate resources, legal foundation, skills, and capacity may be needed.

### **III. OCCUPATIONAL HEALTH AND SAFETY ASPECTS OF WORKING IN THE KNOWLEDGE SOCIETY (EXAMPLE FROM SPAIN)**

Most of the Member States have already prepared activities in this area. The work done in Spain is a good illustration of the various initiatives taken.

In Spain, the Law 54/2003, of 12 December, on reform of the regulatory framework of the prevention of occupational risks (BOE 13 December 2003) is the result of the social concertation of the social agents, business actors and the government and the Autonomous Communities, through the Board of the Social Dialogue. This law has 4 objectives:

- combat the labour accident rate,
- promote the culture of prevention of risks,
- include the prevention of risks in management systems of the company and
- improve the information and the systems about vigilance and control of the Labour inspectorate, as well as the sanction system.

Some of the aspects considered in this law have been developed by Royal Decree of 30 January 2004.

On the other hand, the National Institute of Safety and Health at Work (INSHT) related to the prevention of labour risks induced by the use of information and communication technologies has developed various activities in the following fields: a) the prevention of risks related to ergonomics and the psychosocial factors in the workplace and b) activities of prevention of physical resources.

#### **a) Activities related to the prevention of risks of an ergonomic and psychosocial nature**

Concerning the Royal Decree 488/1997, about posts with visual displays screens, the INSHT has developed a Technical Guide, intended to facilitate the interpretation and technical implementation of the latter and in which methods for the evaluation of the risks corresponding to the posts with visual display screens is contained.

To facilitate the evaluation of risks in the field of Ergonomics and the labour Psychosociology, a set of documents has been published, that can be applied also to the prevention of labour risks derived from information technologies:

- "Manual for the evaluation and prevention of ergonomic and psychosocial risks in the small and medium-sized business". Edit. INSHT.
- "Questionnaire for the evaluation & preparation of the lighting at work". Edit. INSHT.
- "Method for the evaluation and prevention of labour stress" (in printing). Edit. INSHT.

The following Informatics Applications for Prevention (IAP) have been developed :

- IAP for the evaluation of posts with visual display screens (PVCHECK). Edit. INSHT.
- IAP for the evaluation of labour stress. Edit. INSHT.

Other publications of the INSHT are relevant to the field of the prevention of risks in the use of information technologies such as:

- "Telework. New prospects in the organisation of work ". Edit. INSHT.
- "Introduction to the prevention of labour risks of psychosocial origin". Edit. INSHT.

- "Labour Stress". Edit. INSHT.
- "Ergonomics". Edit. INSHT.
- "Effects of the physical atmosphere of work on the people.
- Subjective and behaviour psychophysiological answers ". Edit. INSHT.
- "The mental load of work". Edit. INSHT.
- "Basic Instruction for workers at posts with visual display screens of data". Edit. INSHT.

The INSHT has published two courses in CD-ROM format, intended to facilitate the training for the technicians of Superior and Intermediate level in Prevention of Labour Risks.

The INSHT has also taken part in the Interministerial Commission, for the development of the project CIABSI, intended to establish the ergonomic guidelines to take into account in the acquisition and use of computer technology services.

#### **b) Activities related to the prevention of physical risks**

- Measuring procedures of electromagnetic field of frequencies between 9 kHz and 300 GHz (frequencies used in of radio communications, including for mobile telephony and other data transmission systems by radio).
- Advice to different companies and organisations on labour exposure to electromagnetic fields.
- Participation in AENOR Standardisation Committees: AEN/ctn 209/SC76, and follow-up of the following technical committees: CEN7TC and 123"Lasers related laser equipment, IEC/tc 76 and "CLC/tc 76 "optical radiation safety and equipment laser".
- "Lasers: new classification of the risk European Standard UNE EN 60825-1/A2: 2002". Technical note of Prevention NTP-654, INSHT 2004.

#### **c) Impetus for the adoption of standards**

The Technical Committees of AENOR, Spanish Organisation entrusted with the task of standardisation in all the industrial and services sectors including the ones referring to the adaptability needs for disabled people, are working intensely in the preparation of Technical Regulations in the field of health and ICT. It has published the Spanish Standard UNE 139803:2004 - Computer science for health. Computer applications for people with disabilities. Accessibility requirements for contents on the Web.

#### IV. NATIONAL SURVEY RESULTS

##### **- on working conditions in France**

According to the 3<sup>rd</sup> European survey on the working conditions 2000, 28% of European employees declare that their work causes them stress. The results of the two previous surveys (conducted in 1990 and 1995<sup>90</sup>), show some stability of this percentage since 1995.

Apart from the French part of the European surveys, there are no specific national French studies on stress at work. However, the periodic surveys "Working conditions"<sup>91</sup>, carried out by the ministry of Work to a representative sample of the French working population, make it possible to identify restrictive work characteristics and their development over time.

One can thus observe, from the last three surveys, the following developments. Certain constraints connected with work worsen gradually over time:

- Thus, more than one worker out of two works in urgency; more than one in three says to apply strictly the instructions or receives contradictory orders.
- For one employee in three, the relations in work are a frequent source of tensions.
- Lastly, the feeling of responsibility, with respect to his work, concerns increasingly more workers.

Intensification of work		
<i>Proportion of employees who declare ...</i>	In 1991	In 1998
... they frequently have to stop a task that they are doing to carry out another one, non envisaged:	48	56
... they have often or always to hurry:	-	52
... they do not to have enough colleagues:	27	30
... they lack time to correctly carry out their work:	23	25

These figures have been reflecting an increasing intensification of work since the nineties. Thus, more than half of the French employees state to work in urgency.

Constraints of work rhythm			
<i>Proportion of employees who declare ...</i>	In 1984	In 1991	In 1998
... their rate of work imposes rhythm constraints	5	8	10
... their rate of work is imposed by standards or deadlines lower than the hour	7	16	23
... their rate of work is imposed by a request to be satisfied immediately	28	46	54

An increasing number of employees perceive their work rhythm as stressful. Moreover, in 1998, one person out of three, said to be unable to vary oneself the deadlines fixed for carrying out his/her task.

Degree of autonomy/of control
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<sup>90</sup> The European Foundation for the Improvement of Living and Working Conditions periodically carries out a broad survey to a representative sample of the whole European working population. In 2000, 21.703 workers (1500 by Member State) were questioned in private interviews, apart from their workplace.

<sup>91</sup> "Working conditions" surveys of the Directorate of the Animation of the Research of Studies and of the Statistics (DARES) of 1978, 1984, 1991, and 1998.

In 1998, one person in three states to have to apply strictly the work specifications, even if, between 1991 and 1998, the development seems to head towards more room for manoeuvre.

Employment relationships		
<i>Proportion of employees who declare to ...</i>	In 1991	In 1998
often live situations of tensions in their relations to:		
their colleagues	-	21
their immediate superiors	-	30
the public	22	30
often be forced to manage on their own in difficult situations	-	24
have no possibility to cooperate	13	14

In 1998, situations of tension with the immediate superiors are more frequently reported than such situations of tension with the colleagues. One employee in three complains about tension with the public (users, patients, travelers, customers, etc).

Contradictory orders
More than one third (35 %) of the French working population state, in 1998, to receive contradictory orders or indications, which is recognised as a stressful factor.

Feeling of responsibility		
<i>Proportion of employees who declare that an error in their work can or could involve:</i>	In 1991	In 1998
Serious consequences for the quality of the product or of the service	60	65
High financial costs for the company	44	50
Dangerous consequences for their safety or that of other persons	31	38
Sanctions in this connection (risk for employment, major reduction in remuneration)	46	60

Between 1991 and 98, the responsibility feeling tends to increase: more and more employees believe that an error in their work can or could have important consequences for themselves, and/or for the others, and/or for the company.

### **- on ICT use by practitioners in Belgium**

The Walloon Region carries out periodically surveys on the use of ICT in the health care sector. Two particular fields are analysed: the uses of the ICT by care providers having a "private" practice, i.e. practising at least partially in their own cabinet or making visits to the patients at home and the uses of ICT by the hospitals.

The results and principal lesson of these surveys can be downloaded from the following links:

- uses of ICT by the care providers  
<http://www.awt.be/web/dem/?page=dem,fr,040,000,000>
- uses of the TIC by the hospitals  
<http://www.awt.be/web/dem/?page=dem,fr,050,000,000>