# Innovation 4 Welfare

# Practical guide for regional policy actions

European Union
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INNOVATION 4 WELFARE

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# EXECUTIVE SUMMARY

The benefits of innovation have become well understood in Europe. When true innovation occurs, society benefits in a number of different ways: creative solutions to difficult and often complex problems are found, economies are improved and jobs created. When applied to human welfare, innovation can have an especially beneficial impact; human suffering can be alleviated, health outcomes improved and lives made better.

Although innovation cannot be 'created' by public institutions, it can be promoted or fostered by those interested in doing so. However this requires political will to invest the appropriate human and financial resources, education, planning, public policy that lowers barriers to innovative actions and especially in Europe a willingness to collaborate between different sectors, industries and regions.
As a result of these factors, regional development policies can play a central role in either stimulating or hindering innovation. The Innovation for Welfare (I4W, **http://www.innovation4welfare.eu** ) project funded under the 1st call of Interreg IVC was created specifically to improve the effectiveness of regional development policies by stimulating innovation in the field of welfare. I4W is doing this by focusing its activities on 6 participating EU regions (Catalonia, Estonia, Lombardy, Noord-Brabant, South West Bohemia and Upper Austria). In addition to having an impact within the participating regions, important questions in general pertaining to the stimulation of innovation are being addressed, such as: what are effective methods for transferring innovation between communities and sectors and how to build sustainability into innovation promotion systems.

To understand I4W's efforts in achieving this, the current document provides a detailed description and analysis of a number of topics, together these descriptions and analyses provide practical guidance for regional policy makers and for participants in the Innovation 4 Welfare subprojects.

- *European Context for Innovation and Welfare* – Beginning with the 2000 Lisbon strategy, the EU has devoted a great deal of attention to integrating innovation promotion into its policies. Since this time, the Commission has issued dozens of

communications, policy statements on the topic and several important white papers. It also has created programmes that have funded innovation projects (i.e. the Competitiveness and Innovation Programme) and has promoted collaboration within projects (requiring multiple partners for applications). The Commission is furthermore engaged in benchmarking and dissemination activities, funding of training and education and the promotion of initiatives to spread the availability and use of ICT and other technologies. Innovation directed towards human welfare in particular has become especially important as a result of changes in the European economy and society. European efforts to promote innovation will continue and have been made a key part of the 2020 strategy in which 'European Innovation Partnerships' between the EU and national governments will be established to speed up the development and deployment of innovative technologies. This European context is described in section II of this document.

- *Regional Context for Innovation* – The six participating regions of I4W share many similar demographic factors and public sector priorities related to innovation and welfare. They all have aging populations and, on some level, are pursing 'internationalisation' which can lead to additional financial and human resources from outside of the region. All participating regions have regional governments active in the promotion of innovation in different ways. All of them also have a particular interest in improving health care systems and nearly all have targeted the elderly and/or chronically ill as key beneficiaries. Despite these similarities, the six regions of I4W have important differences in the specifics of their innovation policies, how they have supported innovation and how the region's approaches to health and welfare connect to I4W. These points are summarized for each of the partner regions in section III of this document.

- *Identifying innovation 'Good Practices' in each region* – After a review of various policies and practices in each of the six I4W regions, 12 were selected as Good Practices (2 per region). Good practices were selected based upon several criteria:
  - Innovativeness – new ways to address problems and use technology
  - Impact on human welfare – in terms of applications and target beneficiaries
  - Success – in actually meeting specific objectives

- Connection to regional priorities – in terms of regional policy and needs
- Sustainability – not only starting but also maintaining the good practice
- Transferability – (potential for) replication in other situations and/or environments

- *Subprojects for Innovation for Welfare* – The aim of I4W subprojects is to analyse, develop and transfer good practice methodologies addressing specific topics earmarked as key policy issues in partner regions.

  The subprojects are expected to not just execute joint activities such as events and studies to exchange experience, but also to:
  - share and transfer existing good practice methodologies and policy instruments,
  - analyse and develop new approaches and methodologies based on these, and execute regional pilots that test these approaches and methodologies,
  - transfer and implement these in the regions involved.

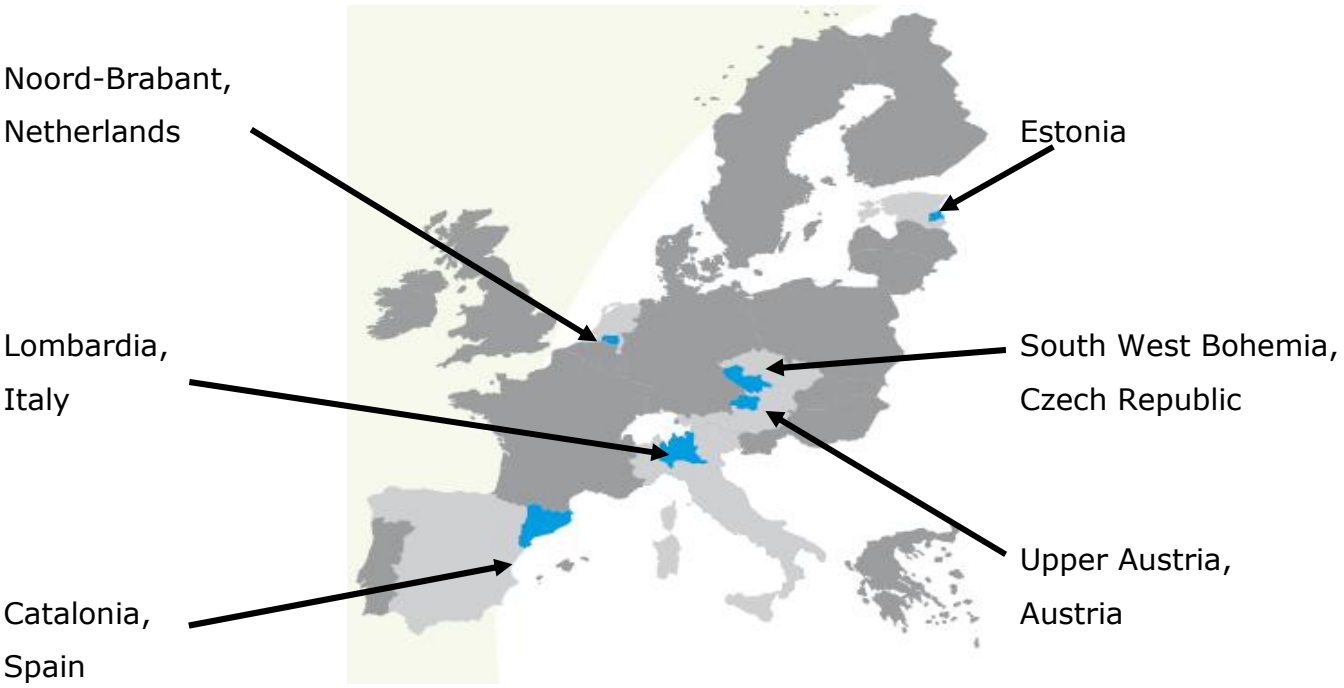
  As the result of the open call for subprojects, 18 proposals were submitted and 8 proposals selected for funding to implement innovation for welfare related activities. Individual subprojects fall into one of *four policy area groups* that directly bridge innovation and welfare: *Food Policy, Rehabilitation, Telemedicine, and Benchmarking/Workplace Safety.* The selected subprojects are expected to produce improvements in at least 8 existing methodologies and strategies for welfare-related innovation policy. Through support by project partners and the Advisory Group this will lead to at least 6 good practices being transferred between regions in the project.

- *I4W Policy Development Framework* – The I4W project has deliberately chosen not to pursue a 'one size fits all" approach. Instead of this the project uses a methodology embracing diverse and customized solutions to problems that affect the health and safety of citizens. This is partially the reason that emphasis has been placed on the identification of specific circumstances in each region, including the demographic, social, political and policy frameworks that currently exist. However, this project was also designed with the belief that, despite these acknowledged differences between regions, there are some overarching issues

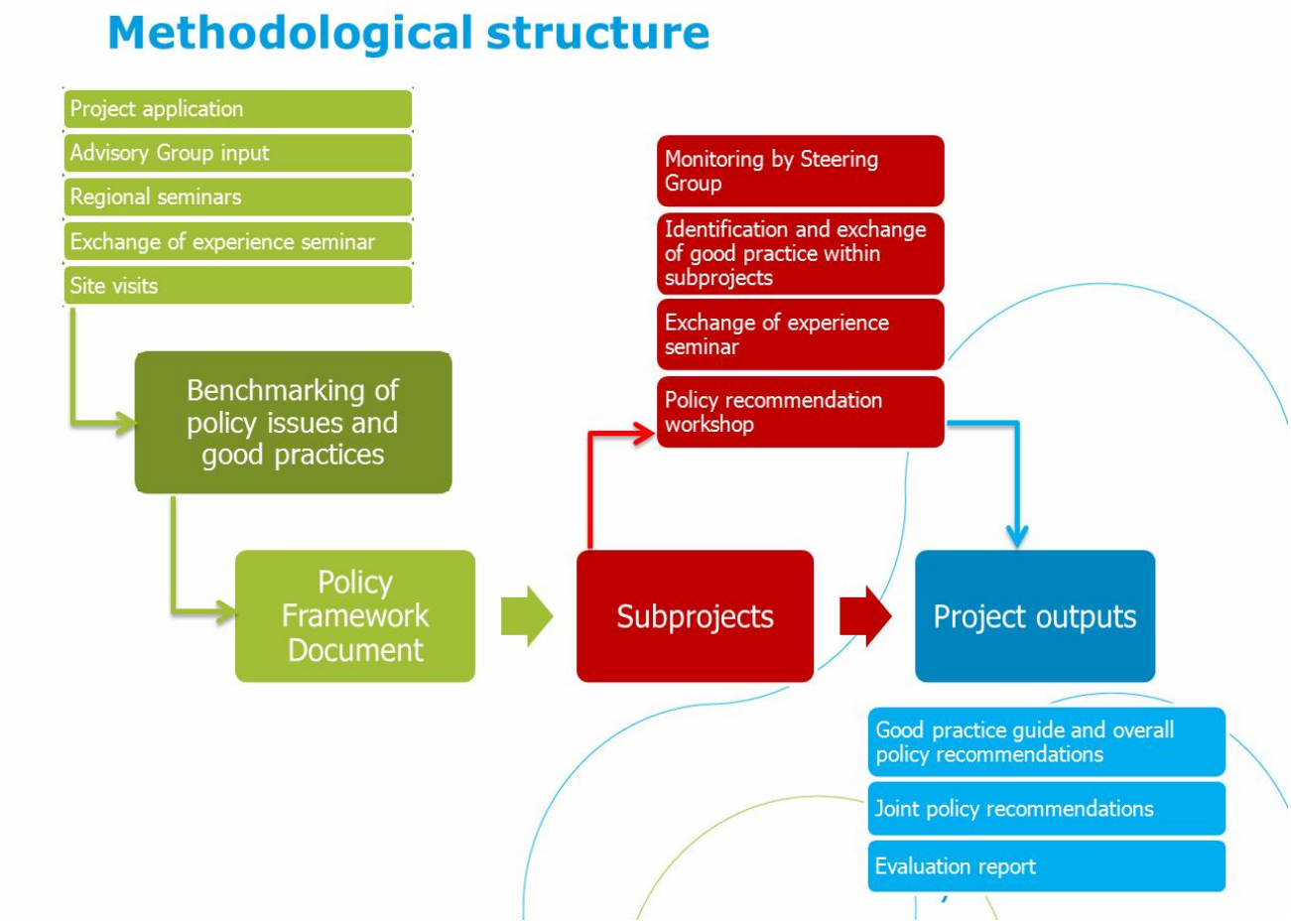
that face all (or most) European regions. Furthermore, there are also initiatives that have been shown to be successful, producing tangible and measurable results in relation to specific objectives. It is therefore believed that the I4W approach will have a real impact on policy development in the partner regions and beyond. The results of the subprojects in particular and the I4W project in general will serve as an effective model for interregional cooperation in Europe.

# I INTRODUCTION

This Practical Guide for Regional Policy Actions is part of the Innovation 4 Welfare project (I4W, http://www.innovation4welfare.eu), which is an interregional cooperation project funded under the 1st call for proposals of INTERREG IVC Programme. I4W has 6 project partners representing the following regions of the European Union:




The primary objective of the I4W project is to improve the effectiveness of regional development policies stimulating innovation in the field of welfare. The following graph presents the overall methodological structure of the I4W project:


Methodological structure
Project application
Advisory Group input
Regional seminars
Exchange of experience seminar
Site visits
Benchmarking of policy issues and good practices
Policy Framework Document
Subprojects
Monitoring by Steering Group
Identification and exchange of good practice within subprojects
Exchange of experience seminar
Policy recommendation workshop
Project outputs
Good practice guide and overall policy recommendations
Joint policy recommendations
Evaluation report

This document describes the steps necessary to reach this objective. It can be used as a guide for policy makers and practitioners who desire to promote innovation, within the participating regions but also throughout all of Europe. This guide consists of the following main parts:

1 *The European Context for Innovation* – As Europe has become more closely integrated, it is now understood that regional efforts of all kinds should consider the broader European context. By doing so, contradictions can be minimized and regional efforts augmented when they are in line with European priorities.

2 *The Regional Context for Innovation* – Although many important characteristics are shared, the six regions participating in I4W are distinct with different demographic, economic and political situations and priorities. Thus, an important step taken by the I4W partners was to examine the circumstances in each region to best understand what implications they might have on innovation promotion.

3 *Identification of Good Innovation Practices* – In order to understand how to promote innovation effectively, we must have an understanding of existing good practices. To gain this understanding, the project partners identified good practices related to innovation and welfare in each participating region and analysed them based upon:

a The technologies utilized and/or promoted and how they were applied
b The beneficiaries and targets of the practice
c The regional impact and consistency with regional/EU policies
d The conditions needed to successfully implement and sustain the practice
e The transferability of the practice to other regions

4 *Subprojects for Innovation for Welfare* – To better understand how to implement and transfer these practices between regions, 8 subprojects are funded through I4W and it is expected that at least 6 existing good practice methodologies and policies are transferred between partner regions. The subprojects are described in more detail, including the composition of the partnerships, their objectives and how they are related to European, Regional and Best Practice policies identified in the previous sections.

5 *I4W Policy Development Framework* – A key component of the I4W project will be to synthesize and interpret the expected result from subprojects in order to gain a better understanding of the connections between regional contexts, best practices and the elements most important for implementing and replicating them. The result of this effort will be a policy framework that will be of use to practitioners within the participating regions and throughout Europe. This framework and the experiences gained through I4W will also be widely disseminated via various approaches to other regions in Europe.

# II I4W PROJECT IN THE EUROPEAN INNOVATION POLICY CONTEXT

## *Introduction to EU Context*

The objective of Innovation4Welfare (I4W) is to improve, through interregional cooperation, the effectiveness of regional development policies that stimulate technology-driven innovation in the field of health and safety ('welfare'). In this way I4W directly addresses EU policy objectives in two areas: it stimulates innovation with the aim of improving economic competitiveness as defined in the Lisbon agenda, and in this way drives the creation of new products and services that support policy initiatives addressing the key societal issue of public health, outlined in the recently adopted EU Health Strategy.

Across Europe, economic and demographic developments pose new challenges in public health: general tendencies to prioritise health and safety, the strong increase in welfare-related diseases and the increased need for home and health care for the ageing population are causing health care costs to increase rapidly. Innovative solutions are necessary to meet these challenges and avoid health care becoming unaffordable. The challenges posed by the changing health needs of Europeans are however also an opportunity: because of the scope of the public health issue, and the enormous implications in terms of the increasing need for products and services in this area, it is an attractive target area for developing innovative new technologies and applications.

Through one integrated (cross-cutting) approach, I4W aims to achieve three main goals:

1 To stimulate regional economic activity by better use of innovative processes and technologies in the field of health and safety, especially by SME's and start-ups as important drivers for economic growth and jobs,

2 To forge new (inter)regional coalitions between the business community (principally entrepreneurs and SME's), knowledge institutes and public welfare organisations that currently do not work together sufficiently, to stimulate the uptake of these innovations.

3 To contribute to welfare as a societal objective through the uptake of these innovations

In this way the I4W project will contribute both to increasing regional competitiveness while at the same time actively addressing the key societal issue of public health.

## *European Innovation Policy*

According to the September 2nd 2009 European Commission Communication "Reviewing Community innovation policy in a changing world"[1] innovation is described as *"the ability to take new ideas and translate them into commercial outcomes by using new processes, products or services in a way that is better and faster than the competition."* It also indicates that innovation must come from people such as scientists, researchers, entrepreneurs and their employees, investors, consumers and public authorities acting with a mindset and in a framework which incites them to enter unknown territories. Innovation helps to create a knowledge-based economy that is crucial to remain competitive in the globalised world and to achieve wider societal goals in a sustainable way.

### A Short History of EU Innovation Policy

The need to support and promote innovation was incorporated into the Lisbon strategy for growth and jobs that was launched originally in 2000. The European Council defined the objective of the strategy for the EU "to become the most dynamic and competitive knowledge-based economy in the world by 2010 capable of sustainable economic growth with more and better jobs and greater social cohesion and respect for the environment." Underlying this was the realisation that the agenda could not be pursued at the EU level alone: close co-operation between the EU and amongst Member States would be necessary as well.

[1] http://ec.europa.eu/enterprise/policies/innovation/files/com(2009)442final_en.pdf

After a mid-term review, the Lisbon Strategy was re-launched in 2005. To ensure a more successful effort, the re-launched version defined four priority areas (research and innovation, investing in people/modernizing labour markets, unlocking business potential - particularly of SMEs - and energy/climate change).

In response to the re-launched agenda, the Commission issued a communication "More Research and Innovation – Investing for Growth and Employment: A Common Approach (2005-2007)"[2] The Communication presented 19 points for action around research and innovation, many of which relate to the I4W project (described in more details below).

Ongoing analysis of Europe's global standing, such as the Aho Report[3] published in February 2006 at the request of the European Council, has continued to put innovation at the top of the policy agenda. In particular, the report described the need to make Europe more innovation friendly. The Commission's response to the Aho Report was the Communication about the broad-based innovation strategy adopted in September 2006. It was conceived as a combination of new and up-dated policy instruments.

In 2008 the Commission released 3 Communications on innovation topics including *"The contribution from standardisation to innovation"*[4] which outlined the policies to be implemented to improve the contribution made by standardisation to innovation in Europe; *"An Action Plan on Sustainable Production and Consumption and Sustainable Industrial Policy"*[5] and *"An Industrial Property Rights Strategy for Europe."*[6] Two documents were also issued by the Commission to set up the European Cluster Policy Group and describe how clusters could be useful in innovation policy: *"Towards world-class clusters in the European Union: implementing the broad-based innovation*

2 http://www.eua.be/eua/jsp/en/upload/COM2005_488MoreResearch_and_Innovation.1151581639960.pdf

3 http://ec.europa.eu/invest-in-research/pdf/download_en/aho_report.pdf

4 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0133:FIN:en:PDF

5 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0397:FIN:en:PDF

6 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0465:FIN:en:PDF

*strategy"*[7] and *"Design as a driver of user-centred innovation."*[8] In the same year, the Council released a conclusion in May on *"Promoting creativity and innovation through education and training"*[9]

Innovation will continue to play an integral part of European policy in the coming years, which is demonstrated by the Europe 2020 strategy[10]. Innovation is at the forefront of the strategy, identified first amongst the three priorities of the strategy: "Smart growth: developing an economy based on knowledge and innovation.' Innovation is also identified first amongst the seven flagship initiatives put forth by the EU, to create an "Innovation Union", the goal of which is to improve framework conditions and access to finance for research and innovation across Europe, so that innovative ideas are turned into products and services that create growth and jobs.

**General Approaches to Innovation Promotion**

During the past ten years, the numerous Commission and Council directives have led to the development of a number of different policy tools to promote innovation that spans across seven different Commission Directorates, various sub and independent agencies and over 20 committees with representatives from the Member States.

In developing a framework for innovation, the EU has stressed several overlapping themes:

- *Increased resources available for innovation* – Innovation activities are by their very nature time and resource consumptive and often come with great risk of failure. One way the EU has attempted to deal with this has been to redeploy EU and State aid towards the support of research and innovation. This includes over 50 billion Euros for the FP7 and its related funding instruments. The EU has also promoted the use of Structural Funds and the Rural Fund to stimulate innovation. In addition to money, the EU has developed various activities to increase the skills

7 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0652:REV1:en:PDF

8 http://ec.europa.eu/enterprise/policies/innovation/files/design_swd_sec501_en.pdf

9 http://www.eu2008.si/en/News_and_Documents/Council_Conclusions/May/0521_EYC-creativity.pdf

10 http://ec.europa.eu/eu2020/index_en.htm

and training of potential participants in innovation. In recognition of the often time consumptive nature of innovation, funding has been offered through multiple year contracts that enables recipients to focus on research and experimentation as opposed to fundraising. Examples of this funding include:

- 7th Framework Programme for research and technological development
- Competitiveness and Innovation Programme (CIP)
- Trans-European Networks (TENs)
- Lifelong Learning Programme
- Galileo Programme
- European Institute of Technology (EIT)
- European Territorial Cooperation

- *Improved Coordination of EU/member state innovation policies* – Like any effort undertaken by government, overlapping or contradictory actions can severely limit effectiveness. This is especially true of innovation, considering the high risk and resource intensity that is typically required. This is even more relevant in the EU, where a multitude of different governmental jurisdictions can result in uncoordinated activity. The EU has attempted to address this by engaging in dialogue with stakeholders to identify regulatory barriers to research and innovation, particularly using European technology platforms and sectorial innovation to facilitate more coherent development of technology and of the regulatory environment. Particular agencies and EU entities have been tasked with the responsibility of ensuring coordination within its particular segment of innovation. For example, research policies have been coordinated in part under the auspices of the Council's Scientific and Technical Research Committee (CREST). Several other agencies are described in more detail below.

- *Provide guidance to national governments* – Individual states cannot 'force' innovation – it must come from people and organizations. However, governments can create favourable conditions that foster innovation. These conditions include spending above the average for education, training and lifelong learning; a high share of R&D spending in GDP and instruments to support the uptake of new technologies and products in the public and private sectors. Stimulation of the exchange of best practices is also important. The EU has also sought to motivate

public authorities to promote innovation through the use of public procurement methods to stimulate demand for new technologies including transport, energy, environment, health, education and information and communications

- *Stimulate transnational cooperation and coordination supporting research and innovation* – by creating the European Research Area (ERA) in 2000, which has enabled researchers to move and interact between countries more freely. The goal was to share, teach, value and use knowledge effectively for social, business and policy purposes. The ERA would also enable better coordination of European research to address major challenges together. The effort has also resulted in stronger links with partners around the world so that Europe benefits from the worldwide progress of knowledge and is better able to take an active and/or leading role in international initiatives to solve global issues.

- *Promote cooperation amongst and within different sectors* - by defining EU guidelines to give incentives for research collaboration and knowledge transfer between public research organizations such as universities and industry (including SMEs). Within specific industries, EU policy has sought to promote the development of clusters – groups of similar firms who by sharing information, working together and focusing on specific competency areas can create synergies that benefit the efforts of all. Cooperation has been a key element in nearly all EU funding schemes.

- *Identification, Benchmarking and Dissemination of Best Practices* – one of the key results of these knowledge sharing activities is that they have enabled the identification of effective approaches towards the promotion and the actual undertaking of research and innovation at all levels (i.e. amongst firms, clusters of industries, local and member state governments). Information relating to innovation is collected by the EU at various levels and benchmarked, to provide a way for member states, regions and others to measure their level of innovation and the degree to which public policies currently in place in different locations promote or hinder innovation.

- *Improve the Quality and Availability of Information and Communication Technology (ICT)* – ICTs have become key technologies in all aspects of modern life. They are used at work, in day-to-day relationships, in dealing with public services as well as in culture, entertainment, leisure and for community and political participation. This is especially true for innovation in Europe – which requires communication amongst researchers, entrepreneurs, administrators and others at all levels, often over great distances. ICT also provides access to the large amounts of data and information that can useful when engaging in research and experimentation. ICT can also be incredibly useful in terms of disseminating best practices and other information. In recognition of this, the EU has sought to facilitate easier access to ICT by removing barriers, making ICT tools easier for everyone to use, and encouraging people to use them by raising awareness of their economic and social benefits.

- *Support of Short Uptake and Long Term Innovation* – A great deal of support from the EU has been to longer-term research based initiatives that have a great potential for economic and social progress in European society. But, by their very nature, these efforts have a relatively high risk of failure. While vitally important, there is also a need to promote innovation that results in the direct uptake of new technologies, so that the results of innovation can be commercialized at the present moment.

## *EU Innovation Policy and Welfare*

As described above, it is believed that the promotion of innovation at the EU level is valuable because it can benefit European society in multiple ways. In particular, innovation is seen as having important economic benefits such as making European business and industry more competitive globally, producing jobs and creating wealth. All of these improvements obviously can have a significant impact on the well-being of European citizens. However, the I4W project focuses on promoting specific kinds of innovation – those directly related to human health and welfare. Through the development of technology and innovative approaches to solving problems, important demographic changes that could affect the health of Europeans can be addressed to improve the future welfare of Europeans.

Based upon this more specific view of innovation, *four focus areas t*hat lie on the interface between innovation and human welfare were identified as especially important in the I4W project. These are: *Food, Teleservices, Rehabilitation and Workplace Safety/Benchmarking*. These areas are of particular importance because they share several important common characteristics:

- Each has the ability to address important aspects of human health
- Each can benefit greatly from the implementation and integration of emerging technologies, meaning that benefits can be realized in the short term future (while still holding promise for even greater benefits in the long term)
- Each responds to particularly important issues that will affect Europeans in the coming years (such as the ageing population, specific diseases and chronic conditions).
- Each of these areas corresponds to priorities identified by one or more of the participating regions of the I4W project (which is described in more detail in section 3 of this report).
- All of the subprojects selected for the I4W project fall under one or more of these categories.

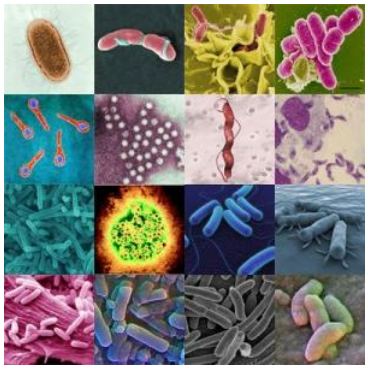
We will describe below the European context for each of these identified focus areas.

## Innovation Focus Area: Food Policy

*EU Food Policy Context and its Relevance to I4W Subprojects*

The central importance of food to human welfare is obvious, but perhaps for this reason it is sometimes overlooked when it comes to the application of innovation. The two I4W subprojects in this area focus on this issue by seeking to make food 'better' in two distinct ways: by reducing the contaminants in food such as food-borne pathogens and by improving the nutritional value of food (such as in fighting obesity) via the creation of new and/or enhanced foods and food fibers. The EU has recognized the importance of both approaches, which is reflected in the policies it has enacted in recent years.

### EU Policy on Food Safety



The consequences of food-borne diseases are evident for all people, but especially for the weakest amongst us, including infants, the elderly and chronically ill. Acute intestinal diseases account for an estimated 2.5 million childhood deaths annually worldwide. Most of them are caused by food-borne pathogens. Moreover, once affected, they are more likely to be hospitalized, and the mortality rate climbs up to 10 times higher than amongst the general population affected by the same diseases. Many elderly people suffer from clinical complications, and it is believed that 2-3% of food borne diseases eventually lead to chronic conditions. Although it is more prevalent in developing countries, the impact of food-borne pathogens on human health can be substantial in more developed countries as well. Just as an example, in the Netherlands there are an estimated 80 000 cases of Campylobacteriosis per year.

Although the risk of food-borne diseases may be in some way reduced by careful food handling procedures in child and elder clinical care facilities, the most successful strategy would be to ensure outstanding food quality and safety along the complete food chain, literally "from farm to fork". An important starting point for this is being

able to conduct food analysis that identifies food-borne pathogens. However, standard operational procedures (SOP) for many of these food-borne pathogens are still lacking and a common procedure for identifying and classifying pathogens has not been developed. Therefore there is a clear need for cheap, fast and reliable diagnostic protocols to detect major food-borne pathogens and trace back their origin, whilst avoiding the long incubation times of traditional microbiological identification methods. Molecular methods of food analysis and identification of food-borne pathogens are perhaps the best candidates for fixing this. However, at least so far, these techniques are available only for each single bacterium. There is no high throughput protocol suitable for a simultaneous identification of different families of food-borne pathogens that allows in the same analysis both identification and stereotyping.

A safe food supply is a major public health and economic issue in Europe, both for foods consumed within the EU area and those produced there and exported. EU policy has reflected this importance, since 2000 the Commission, Council and Parliament have issued hundreds of pieces of legislation relating to food safety issues such as food hygiene and food-borne diseases. Current European food policy has its origins in the General Principles of Food Law (Articles 5 to 10) that entered into force on 21 February 2002 in the joint Council/Parliament Regulation EC/178/2002. It is from this that the EU's integrated "farm to fork" approach was developed as the overriding principle for EU food safety policy.

Relevant to the subprojects of I4W is that the EU regulation established the principles of risk analysis in relation to food and establishes the structures and mechanisms for the scientific and technical evaluations which are undertaken by the European Food Safety Authority (EFSA). Food law, and in particular measures relating to food safety has been connected by the EU to strong scientific base. The EU has been at the forefront of the development of the risk analysis principles and their subsequent international acceptance. Regulation EC 178/2002 establishes in EU law that the three inter-related components of risk analysis (risk assessment, risk management and risk communication) provide the basis for food law as appropriate to the measure under consideration. One of the subprojects would help expand upon the tools and techniques available to conducting this analysis by being able to better identify food borne pathogens.

*EU Policy on Novel Foods*

In addition to reducing contaminants, EU food policy has also sought to regulate the development of better food via the development of new or improved food types also called 'novel' food types. Novel food types have been described as those that:

- present a primary molecular structure;
- consist of micro-organisms, fungi or algae;
- consist of or are isolated from plants or isolated from animals;
- have had their nutritional value, metabolism or level of undesirable substances been significantly changed by production process.

EU oversight of novel foods is based upon two main premises. The first is that, while they have the potential to offer many benefits, they also pose unforeseen risks and unintended consequences as well. Like food analysis, novel food development should adhere to rigorous scientific standards. Secondly, due to the potential health and quality of life benefits presented by novel foods, it also represents a significant potential economic sector that ties into the EU's desire to develop high skilled employment sectors while preserving the agricultural heritage of the continent.

For this reason, the Regulation EC 258/97 of 27 January 1997 of the European Parliament and the Council presented detailed rules for the authorisation of novel foods and novel food ingredients. The regulation was amended twice in 2003 to cover amongst other things genetically modified organism s GMOs and products derived from GMOs.

Based upon this legislation, 'novel' foods/ingredients include any that have not been used for human consumption to a significant degree within the Community before 15 May 1997. For foods commercialised in at least one Member State before the entry into force of the Regulation on Novel Foods on 15 May 1997, the EU has observed the "principle of mutual recognition". In order to ensure the highest level of protection of human health, novel foods must undergo a safety assessment before being placed on

the EU market. Only those products considered to be safe for human consumption are authorised for marketing.

Companies that want to place a novel food on the EU market need to submit their application in accordance with *Commission Recommendation 97/618/EC* that concerns the scientific information and the safety assessment report required. 45 novel foods have been approved by the Commission since 1997. It is important to note that the number of approved foods has increased dramatically – more were approved in the past 2 years than in the entire period between 1997 and 2004. Since 2007, the placing of 3 products on the market has been refused.

**Innovation Focus Area: Rehabilitation**

*Need for Innovation in Rehabilitation*

Physical medicine and rehabilitation involves the management of disorders that alter the function and performance of the patient. Emphasis is placed on the optimization of function through the combined use of medications, physical modalities, physical training with therapeutic exercise, movement & activities modification, adaptive equipment's and assistive device, orthotics (braces), prosthesis, and experiential training approaches. The ultimate goal is to enhance and/or restore functional ability and quality of life to those with physical impairments or disabilities. Thus, in terms of the health and well-being of individual patients and their families, the quality of rehabilitative services can be vitally important.

Technological innovations in rehabilitation sometimes referred to as Technically Assisted Rehabilitation (TAR) offer promising therapeutic approaches for numerous applications in rehabilitation. Brief lists of these include:

- *Musculoskeletal System* – Innovative assistive technologies such as prosthetics with functional electrical stimulation and innovative fluid actors to support patients suffering from neuroparalysis and rehabilitation robotics for stroke therapy.
- *Vision* – Recent years have seen impressive developments in this field such as retina implants.

- *Audition* – The number of people with a hearing impairment is growing - young people, for example, have increased risk of developing hearing disturbances due to their lifestyle. There are innovative technologies to treat patients suffering from hearing impairments, and implantable devices have been improved remarkably within the last few years.
- *Central Nervous System* – Functional magnetic stimulation of specific neuronal areas is in therapeutic use with patients with hemipareses; mechatronic implants improve liquor drainage in cases of hydrocephalus.
- *Tele-rehabilitation* – Neurological rehabilitation – in particular after a stroke – often takes too long to keep patients in hospital until it is finished. On the other hand, effective neurological rehabilitation depends on regular exercises under qualified instruction. Tele-rehabilitation concepts are a very promising approach to close this gap and are shown to be effective with regard to patients' recovery and costs.

The need for rehabilitation in Europe is increasing as the age of the population increases. As a result of a simultaneous decline of birth and mortality rates, over 21 percent of Europeans are older than 60 years of age. By 2050, nearly 34 percent will be above 60. This fact has significant importance in nearly every aspect of European welfare and public policy, especially health care. People aged 65 years of age and over are more likely to be injured because of various medical problems and impairments of vision, gait and balance; their injuries are more likely to be severe because of osteoporosis and frailty, and once injured they are more susceptible to fatal complications and longer ill-health because of their diminished recovery capacity. Falls are a particular problem, and older people who experience them, as well as other injuries, have longer hospital stays and greater mortality.

As the group most likely to suffer from chronic diseases, disability and other impairments, the health needs of rehabilitation patients are high. The increasing demand places additional weight on an already overburdened health care sector, where shortages of doctors, nurses and beds are commonplace in some areas. It also poses significant financial costs, as healthcare spending grew faster than gross domestic product in virtually all European countries from 1990 to 2004. Amongst the six partner countries for I4W, health care spending accounts for 7% to 11% of GDP. From a public policy perspective the costs of health care in Europe are even more

important – amongst the six partners, between 66% (Netherlands) and 89% (Czech) of healthcare costs are paid from public funds. This has become even more apparent and significant during the recent financial crisis in which states have looked to reduce costs in nearly all spheres of activity.

*EU Policy Approach towards Rehabilitation*

In response to these economic, systematic factors, and with the aid of advances in technology, the nature of rehabilitative services is changing dramatically. Traditionally, rehabilitative therapy had to be offered to a patient by a therapist (usually one on one) in healthcare facilities. When therapy becomes long or continuous over the years, travelling to a health centre will often be difficult, time consuming and expensive. As Europe's population continues to age, the number of home bound patients will inevitably increase as well, making transportation to facilities even more difficult. Thus it seems likely that the future of rehabilitation (like many health care services) will be to provide as much of it as possible in the home. Methods of enabling patients, especially the elderly to stay in their homes is often referred to as Ambient Assisted Living (AAL). Studies have found that health outcomes are often better when patients are able to stay in their homes and that if done properly, can be much less expensive then care within a facility.

In response to these challenges and opportunities, the European Commission has launched an in June 2007 which is in part designed to break down barriers that prevent older people from using Information and Communication Technology (ICT) products, services and applications. As a result, between now and 2013, the EU and Member States, and the private sector will invest more than €1 billion in research and innovation on ICT to stimulate developments in technologies designed to help older and special needs people to receive medical and social support services that enable them to continue to live at home.

Specific measures of the plan include efforts to:

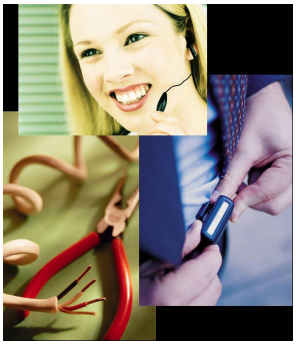
- Raise awareness, and build consensus via the promotion of stakeholder cooperation and the establishment of an ICT and Aging best practice internet portal (http://www.epractice.eu).
- Reduce technical and regulatory barriers to market development, through market assessments, studies and benchmarking and by facilitating the exchange of best practice between Member States.
- Accelerate take-up through, for example, a set of pilot projects under the ICT Policy Support Programme and use of Structural Funds. To date, 10 large pilot projects related to ICT & ageing have been launched with involvement of more than 30 European regions.
- Boost research and innovation to foster the emergence of innovative, ICT-based products, services and systems for Europe's ageing population.

Through the 7th Framework Programme the European Commission, DG Information Society and Media have funded the Ambient Assisted Living Innovation Alliance to focus on Ambient Assisted Living (AAL) solutions based on advanced ICT technologies for the areas of ageing at work, ageing at home and ageing in the society. The purpose of AALIANCE is to:

- Provide a framework for stakeholders, led by the industry, for the definition of research and development priorities, timeframes and action plans on strategically important issues in the field of Ambient Assisted Living
- Play a key role in ensuring an adequate focus of research funding for AAL, in fostering effective public-private partnerships and in developing a European research policy, in particular in focusing on FP7 and on current activities launched by EU member states (AAL Joint Programme).
- Prepare and maintain the „Ambient Assisted Living Roadmap" which lays out that the strategic research agenda for AAL with a mid to long perspective
- Support European and national entities in increasing the political awareness and in intensifying activities for the enhancement of new AAL technologies.

**Innovation Focus Area: Teleservices**

*Need for Teleservices and I4W subprojects*



Europe is the midst of major demographic changes that has significant implications for all areas of health and welfare policy. Chief amongst these is the "Greying of Europe." After the countries of Japan and South Korea, Europe is aging faster than any other part of the globe. As a result of a simultaneous decline of birth and mortality rates, over 21 percent of Europeans are older than 60 years of age. By 2050, nearly 34 percent will be above 60. This fact has significant importance in nearly every aspect of European welfare and public policy, especially health care. As the group most likely to suffer from chronic diseases, disability and other impairments, their health needs are high. The increasing demand places additional weight on an already overburdened health care sector, where shortages of doctors, nurses and beds are commonplace in some areas. It also poses significant financial costs, as healthcare spending grew faster than gross domestic product in virtually all European countries from 1990 to 2004. Amongst the six partner countries for I4W, health care spending accounts for 7% to 11% of GDP. From a public policy perspective the costs of health care in Europe are even more important – amongst the six partner countries, between 66% (Netherlands) and 89% (Czech) of healthcare costs are paid from public funds. This has become even more apparent and significant during the recent financial crisis in which states have looked to reduce costs in nearly all spheres of activity.

The desire to keep health care costs down has led to a steady expansion of the home care sector. This growth has been fuelled by the belief that patients can experience better quality of life living in their own homes than in institutional settings. Which might be one reason that studies have indicated that home based care might be more effective and efficient than institutionalized care. As a result, more than 30% of the public resources spent on long-term care in many European countries, ranging from 0.2% of gross domestic product in Spain to 2.75% in Sweden. Viewed through the lens of innovative thinking, this state of affairs is not simply a "problem" but also an opportunity for it opens significant business opportunities for service providers that can deliver new technical solutions for home-based welfare services and products. As a result, the number and scope of conditions for which teleservices can be used to

address in the home has steadily increased. Two areas targeted by subprojects of I4W relate to care giving of Alzheimer/Dementia patients and fall prevention of elderly people with cardiovascular diseases.

*Dementia* is a decline in mental ability that usually progresses slowly, in which memory, thinking, and judgement are impaired, and personality may deteriorate. It usually develops slowly, and affects mainly those aged over 60. It is one of the most important causes of disability in the elderly; with the increasing proportion of the elderly in many populations, the number of dementia patients will rise also. The most common causes of dementia in EU are Alzheimer's disease (about 50-70% of cases), the successive strokes which lead to multi-infarct dementia (about 30%); other causes are Pick's disease, Binswanger's diseases, Lewy-Body dementia and others.

In Europe, Alzheimer and dementia pathologies currently affect 16% of the population aged over 65 and 30% of those over 85. As a result, 6.1 million people suffer from some type of dementia in the European Union, a figure that is expected to double in the near future as the average age and life expectancy of the European population continue to rise. The disease is of particular concern to policy makers due to its growing number of cases and the complexity of the treatment of dementia disruptions which require expensive multiple services. It is estimated that the costs of treatment for Alzheimer and dementia amount to more than the costs of heart disease, stroke and cancer combined. This includes the cost of hospitals, residential care and informal care, (in terms of the time that it is spent in family care activities). The family dimension of the condition cannot be ignored either, for Alzheimer and dementia places a significant burden on families and relatives for which they are rarely prepared. Chronic mental disorders turn relatives into the patient's principal carer and compel them to face a two-folded impact: on the one hand he/she experiences a traumatic emotional impact and, on the other hand, he/she is forced to undertake the heavy, time consumptive and expensive tasks of caring.

*Cardiovascular Diseases* is the other issue addressed by teleservices amongst the I4W subprojects. Cardiovascular diseases kill over 2 million Europeans each year – nearly half of all deaths, making it the number one cause of death on the continent. The economic costs associated with cardiovascular diseases are likewise staggering: an estimated €192 billion in 2006, almost €110 billion of which were for health care costs and €82 billion were from lost productivity and the cost of informal care. The direct health care costs alone cost each resident of the EU €223 per annum. Cardiovascular disease and its connections to blood pressure, high cholesterol and diabetes is well documented – but one less known aspect is its linkage to non-accidental falls amongst the elderly. Studies have indicated that at least 1/5 of non-accidental falls are caused by syncope (loss of consciousness) connected to cardiovascular disease such as carotid sinus hypersensitivity (CSH), carotid sinus syndrome and cardio inhibitory CSH. Studies have found that the insertion of dual-chamber pacemakers in non-accidental fallers with cardio inhibitory carotid sinus syndrome significantly reduces falls. Injuries from falls amongst the elderly are set to become a major social and economic problem in the years to come. It is estimated that as much as 30% of people over 65 years living independently fall each year, and this figure is even higher for people in residential or acute care. About 20% of falls require medical care and in Europe 50 000 older people die of fall injuries every year, the equivalent of the annual death toll of road accidents for all age groups taken together. As the share of the population aged 65 and over grows rapidly, the number of fall-related injuries could rise dramatically, and with it, the strains on hospitals, medical services, social services and public budgets. When an elderly person falls frequently, often times the only option is long-term institutionalization. Yet, in most countries the problem has so far received little attention. Fall prevention is very rarely treated in a systematic way at the national level.

*EU Telemedicine Policy Approach*

Advancements in Information and Communications Technology (ICT) have led to increased use of teleservices (usually referred to as telemedicine when used in health care settings). Telemedicine is useful in any place in which there is a shortage of skilled physicians in specific areas of expertise, geographic disparities in terms of population or income (in particular rural vs. urban) or for conditions

in which rapid diagnosis can have a significant impact on health outcomes. In other words, it can be useful in any of the regions participating in this project and nearly every region in the world.

In recognition of this and in response to the challenges for the European healthcare systems described above, the EU has developed a comprehensive telemedicine policy initiative in which it has sought to:

- Build confidence and acceptance of telemedicine services
- Bring legal clarity to the issue
- Facilitate market development.

The EU has established eHealth as one of the six markets of the Lead Market Initiative (LMI) due to its market potential in terms of growing demand and market growth opportunities, changing demographics and disease patterns, and healthcare capabilities. Of particular relevance is the LMI for eHealth. eHealth has been defined by the WHO as "the combined use of electronic communication and information technology in the health sector." Within this initiative, four key market segments have been identified for areas of focus. One of these segments is "Telemedicine Systems and Services" which includes telecare, teleconsultation and telemonitoring.

The Commission has also sought to encourage Member States to integrate telemedicine into their health policies. On 2 November 2008 it issued a communication entitled "Telemedicine for the benefit of patients, healthcare systems and society". This policy document included a 10-point action plan that has resulted in the following:

1 Member States have been urged to assess their needs and priorities in telemedicine to be included as part of the national health strategies presented and discussed at the 2010 eHealth Ministerial Conference.
2 By the end of 2011, Member States should have assessed and adapted their national regulations enabling wider access to telemedicine services. Issues such as accreditation, liability, reimbursement, privacy and data protection should be addressed.
3 A European platform is being developed to support Member States in sharing information on current national legislative frameworks relevant to telemedicine.

4 In September 2009 the "Study on the Legal Framework for Interoperable eHealth in Europe" was released, including the chapter 'Regulatory Framework for Telemedicine.'

5 Projects to assess the interoperability of telemonitoring systems are being funded, including both existing and new standards.

6 By the end of 2011, the Commission, working with Member States, will issue a policy strategy paper on how to ensure interoperability, quality and security of telemonitoring systems based on existing or emerging standards at the European level.

7 Through the Competitiveness and Innovation Programme, the Commission will support one large-scale telemonitoring pilot project.

8 By 2011, guidelines for consistent assessment of the impact of telemedicine services will be released, including effectiveness and cost-effectiveness. So far, two studies on the "Methodology to assess Telemedicine Applications" (02-2009/02-2010) and the "Economic Impact of Interoperable Electronic Health Records and ePrescription in Europe" (01-2008/02-2009) have been funded.

9 The Commission will continue to contribute to European collaboration between health professionals and patients in key areas with the potential for greater application of telemedicine, in order to make specific recommendations on how to improve confidence in and acceptance of telemedicine

10 The Commission is supporting the collection of good practices on the deployment of telemedicine services in the Member States via the eHealth2010 conference held in March, the i2010 subgroup on eHealth, the Telemedicine on ePractice, knowledge sharing and the February 2009 report: "eHealth in Action - Good Practice in European Countries."

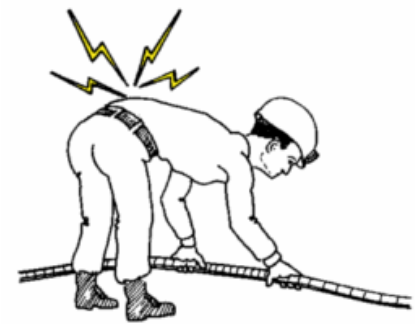
**Innovation Focus Area: Work Safety/Benchmarking**

*Need for Work Safety Action*

Europeans spend approximately ¼ of their lives at work, so to promote health and welfare, working conditions should be considered. In 2000, the Lisbon summit identified specific objectives to create quality jobs and increase workforce participation. Since that time, the Commission has issued two Community strategies for improving health and safety at work for 2002 – 2006 and 2007 – 2012. Under the current strategy, a primary goal is to cut work-related accidents by a quarter across the EU. In the EU-15, workers are injured in accidents every five seconds. Furthermore, one dies every two hours. Overall, this equals 7.6 million accidents at work and 4,900 fatalities every year. In addition, a significant amount of these injuries result in three days of absence from work. Not only is health and safety at work important to the individual, but also it is important to the business. The cost of accidents at work and occupational illnesses ranges from about 3-4% of Gross National Product

Working environments are continuously changing with the introduction of new technologies, substances and work processes, changes in the structure of the workforce and the labour market, and new forms of employment and work organisation. New work situations bring new risks and challenges for workers and employers, which in turn demand political, administrative, technical and regulatory approaches to ensure high levels of safety and health at work.

One example of changes in workforce structure is the „greying" of Europe - by 2050, over 1/3 of the European population will be above 60. For economic and social reasons these people will most likely still be working, which presents challenges for developing innovative techniques to preserve safety on the job.



Older workers face many health challenges in general but at work in particular. One example of this is work-related musculoskeletal disorders (WMSDs), which is the

umbrella term used to describe a group of painful disorders of muscles, tendons, and nerves. Carpal tunnel syndrome, tendonitis, thoracic outlet syndrome, and tension neck syndrome are examples. Work activities which are frequent and repetitive, or activities with awkward postures cause these disorders which may be painful during work or at rest. WMSDs are commonly reported work related health problem by European workers: 30% (44 million) complain of backache; 17% complain of muscular pains in their arms and legs; 45% report working in painful or tiring positions; 33% are required to handle heavy loads in their work. Older workers in Europe report more MSD problems. For example the EU average for reports of backache is 30%, for 15-24 year olds it is 25%, for 55 plus it is 35%. Many older workers will have spent more time working in WMSD risky situations. In addition jobs are generally designed for young and healthy male workers. The economic costs of WMSDs in terms of health care costs and work days lost is also significant – with some studies estimating it as high as 2% of the GNP for some European countries.

*EU Policy on Work Safety*

The European Agency for Safety and Health at Work (EASHW) attempts to raise awareness and educate on the issue by issuing a number of materials related to WMSDs. It also sponsors a Week for Safety and Health at Work that focuses on preventing musculoskeletal disorders.

When undertaking innovation, problems must be reconsidered as opportunities, in the case of WMSD's this is represented by the fact that many could be prevented using ergonomic interventions-to modify work and workplaces based on assessment of risk factors. In an EASHW report entitled "Work-related neck and upper limb musculoskeletal disorders (WRULD)" it is written that "There are strong arguments that Work Related Upper Limb Disorders have a biological basis. Scientific studies concerning biomechanics, mathematical modelling and direct measurement of physiological changes provide a coherent and persuasive argument of the biomechanically induced pathology of disorders that affect muscle, nerves, tendons and other body tissues. The understanding of the biological mechanisms of WRULDs varies greatly between specific disorders. For carpal tunnel syndrome, for example, the knowledge is impressive, whereas for some other disorders more research is

needed. But even for those disorders where the knowledge base is smaller there are plausible hypotheses for a biological origin and research is ongoing."

Furthermore, in the coming years, the legislative basis for dealing with WMSDs will most likely expand. In 1990 the European Commission introduced two Directives intended to address the problem of work-related musculoskeletal disorders (MSDs); one on Manual Handling and another on the use of Display Screen Equipment. In 2004 and 2007 the Commission consulted European social partners on extending its legislative framework to all work-related MSDs risk factors. In 2008 it commissioned research on the possible impact of a number of EU level policy options designed to improve the prevention of work-related MSDs. In 2009 the Commission proposed a new Directive addressing all significant risk factors for work-related MSDs and repealing the previous two Directives. After a series of meetings, including a working group of the Advisory Committee on Safety and Health at Work (ACSH) and an Expert Group, composed of representatives from all Member States, the Commission has decided more research is needed to prepare an assessment of the economic, social and environmental consequences of the proposal. Publication has been deferred, probably to 2011

*Need for Benchmarking*

A valuable tool in innovative activity is the use of benchmarking and best practices. Innovation by its very nature often involves new or unexplored areas, or new ways to approach existing activities. This newness presents a problem in measuring effectiveness, how do we know how effective an action is if we do not have a point of reference for it? Benchmarking can address this problem by establishing standards by which innovative actions can be compared. Setting standards can also be valuable in terms of enabling comparisons between or within systems. They can also be useful in establishing 'best practices' to dealing with problems.

*EU Benchmarking Activity*

In recognition of the value of benchmarking, the EU has undertaken efforts to develop benchmarks in nearly all of its policy areas. For example, in the Community strategy on health and safety at work 2002–06 the European Agency for Safety and Health at Work is called on to 'set up a risk observatory'. One of its priorities would be to anticipate new and emerging risks, whether they are linked to technical innovation or caused by social change'.

The strategy emphasizes that this should be done by 'ongoing observation of the risks themselves, based on the systematic collection of information and scientific opinions', as part of the development of a 'genuine culture of risk prevention'. The Agency, therefore, took the first step towards establishing a European Risk Observatory, commissioning its Topic Centre Risk Observatory (TCRO) — the former Topic Centre Research on Work and Health (TCWH) — which includes some of the principal OSH institutions in Europe, to identify emerging risks related to OSH. Underlying this approach is a commitment to develop policy based upon scientific analysis of conditions. To this end, two types of activities have been carried out: the collection of published information from reliable sources—still ongoing—and the production of expert forecasts. The expert forecasts on emerging OSH risks were reached through questionnaire based surveys on physical risks; psychosocial risks; chemical risks; and biological risks. Answers were received from 188 experts from 24 countries and one international organization.

Of particular importance for I4W is the eHealth Benchmarking study, which aims to identify and collect quantitative and qualitative evidence of eHealth deployment and use in the European Union, Norway, Iceland, Canada and the United States - with a particular focus on measurements specified in the European Union's eHealth Action Plan. Sources to be covered include healthcare associations and bodies, international organisations such as OECD and WHO, IT industry, national statistical institutes and authorities at regional and national level. This information will not only help to better understand eHealth progress but also to identify main gaps, obstacles and barriers in relation to eHealth monitoring / benchmarking to be overcome in the next few years. The study found 94 sources of eHealth benchmarking data (with more than 4,300 eHealth-related indicators), identified 12 good practice cases and filled 31 country

briefs that describe the situation in each of the surveyed countries. The study proposes an indicator framework that covers the most relevant actors, activities and applications in the area of eHealth.

# III I4W PROJECT IN THE REGIONAL CONTEXT

## *Introduction to Regional Context*

The I4W project is comprised of 6 regional partners (http://www.innovation4welfare.eu/98/partners.html) that represent diverse parts of Europe. The diversity of the region is illustrated by many different measures. For example, the population of the largest partner (Lombardy) is over 9 million more than the smallest (SWB in Czech). 3 partners are under 1.5 million in population where as the largest two are over 7.5 million. In terms of land size, the gap between largest and smallest (Estonia and Noord Brabant) is over 40 000 sq. km. The average monthly income for some regions is well over 2000 euro (Noord Brabant, Catalonia, Lombardy) whereas for others it is 800 or less (Czech, Estonia). Partner regions are also quite different in terms of their levels of autonomy and wealth in defining, financing and implementing relevant policies. Consider two partners, Catalonia in Spain which is one of the wealthiest regions, but is constrained by its delicate relations with the national government as opposed to Estonia, which as a national government that has no such policy constraints but has less resources available for investment.

Despite these differences, innovation, health care and welfare issues represent key policy areas that link all partner regions, creating a common ground for I4W. In some ways, these differences are extremely valuable, especially in terms of subprojects. As described in the next section, subprojects have partners from multiple regions, meaning that they can benefit from the different strengths of the partner regions. Also, knowledge sharing – an important goal of I4W – is only valuable if participants have different knowledge to share. However, to capitalize upon this, we must first understand the contexts of each region, including their policy similarities and differences. The current chapter helps to do this by describing the context, policies and priorities of each partner region. The chapter also indicates regional expectations for the IW4 project.

# *Catalonia*

## 1 Innovation Policy in Catalonia

The Government of Catalonia considers innovation and R&D as transcendental factors for its future. Thus, the Department of Innovation along with private universities and enterprise has identified a model of public intervention in which research and innovation are the structural bases for development. Consequently, a priority is on the country's political, social and economic agendas. Specifically, the government aims to achieve one of this department's priority goals - making Catalonia an economic driving force in Europe and a magnet for attracting talent in the Mediterranean region - by backing internationalisation, research and innovation as key elements for obtaining excellence. Likewise, for Catalonia to become a top level international focal point the Government has recently undertaken several clearly relevant initiatives such as the "Catalan Agreement on Research and Innovation" and the "Strategic Agreement for the internationalisation, quality of employment and competitiveness of the Catalan economy 2008-2011."

In addition, I4W Lead Partner ACC1Ó was created as an instrument of support for this policy. Therefore, ACC1Ó has become the agency for innovation and internationalisation. Amongst its aims, is included the execution of the policies of the Catalan Government on R&D as well as the promotion of innovation in Catalan companies.

## 2 Supporting Innovation

The connection of innovation and society in the Catalonia region can be identified through some concepts included in the "Catalan Agreement on Research and Innovation" where the shared vision of Catalonia 2020 is that of a territory with the following characteristics:

- Environments of excellence that trains and retains the best scientific and innovative talent.
- Cutting-edge research in universities, hospitals and research centres that is effectively valued.

- A large number of enterprises that systematically integrate innovation into their activity.
- Innovative administration and government agencies that boost research and innovation.
- Cooperative knowledge and innovation communities that generate added value.
- Regulatory, socio-cultural and financial environment that facilitates research and innovation.
- A territory structured around and cohesive in the knowledge society and economy.
- An Internationalised presence, link to and action within research and innovation.
- A research and innovation system that is strategically oriented and operationally effective.
- Research and innovation are prioritised in public budgets and private investments.

## 3 Innovation for health care and welfare: how does I4W fit in?

The importance of health care and welfare in Catalan innovation policy is demonstrated in several ways. The Government of Catalonia has increased the funding for research by universities and hospitals to strengthen the investigative mission and the valuing of knowledge. Secondly, it is steering the funding for research and the valuing of knowledge to the universities and hospitals through multi-year programme contracts to enable better resource planning and the setting of objectives.

As in the past years, the government will continue to support Catalan research centres. Likewise, it will encourage these centres to establish the necessary synergies with other agents of the research and innovation system, in particular with the universities, through relationship agreements in which mutual benefit is maximised.

# *Estonia*

## 1 Innovation Policy in Estonia

In Estonia innovation and entrepreneurship are guided by several strategies.

"Knowledge-based Estonia 2007-2013" aims at setting the goals for R&D and innovation. Main goals are to make Estonian R&D more competitive, support innovative business ideas and make innovation national way of thinking. It also states key technologies to achieve these goals – ICT, biotechnology and material science.

"Estonian Entrepreneurial Strategy 2007-2013" visualizes the future where Estonians are creative, innovative and therefore produce high added value for their business.

In the "National strategy for the use of structural funds 2007-2013" priority No 2 is "Enhancing R&D capability, innovation and productivity amongst companies". They also refer to Knowledge-based Estonia and declare to support those objectives with means of structural funds.

In addition, for Tartu and South Estonia region there are some additional strategic development frameworks following and specifying national policies:

- Tartu Regional Innovation Strategy (TRIS)
- Development Strategy Tartu 2030
- Tartu County Development Strategy until 2014

## 2 Supporting innovation

"Tartu Regional Innovation Strategy" (TRIS) outlines four areas of actions to support innovation including:

- develop human capital;
- support networking;
- develop key sectors;
- improve infrastructure.

Innovation for Welfare aims at three areas out of those four – exchange of experience, site visiting and subprojects on methodology integration are excellent means to develop human capital. Subprojects with partners from at least three partner regions will also improve relations and connections between countries and/or networks and focus on key sectors of biotechnology, ICT and material science hence developing these, nationally important, sectors.

## 3 Innovation for health care and welfare: how does I4W fit in?

Tartu Science Park is responsible for regional cluster development activities and business internationalization and networking tasks. The Regional Innovation Strategy to be defined for subsequent years will use I4W results for the definition of health and safety-related innovation policy. TSP is closely affiliated with Tartu University and other universities and research centres in Estonia, acting as a liaison between business and research community. In addition, TSP regularly partners with key innovation players within the Region of Tartu and at national level such as Tartu County and Enterprise Estonia.

# *Lombardy*

## 1 Regional innovation policy

The Lombardy Region has a strong propensity for innovation, characterized by many Centres of Excellence in the scientific-technological field, an asset of high value for the growth and enrichment of the territorial production system. Concerning Research and Innovation policy, the regional strategy is aimed at better responding to the complex system of research in the region that is gradually acquiring characteristics of multi- and interdisciplinary. The four pillars of the regional strategy include:

- training and development of human capital to increase the capacity to attract and keep the most brilliant students;
- meritocracy to "make the strong stronger" and increase competitiveness on the territory, reinforcing new ideas that can translate into tangible activities (e.g. seed capital);
- predominant attention to the demand pull for research and innovation for rather than the supply of research; and
- support to infrastructure and open labs.

## 2 Innovation and the key issues in Lombard society

Concerning the research and innovation strategy, the focus has changed to adjust to the models adopted on a national and international level, giving preference to "demand," identifying the priority problems to be addressed in four areas:

- *HEALTH*
  - Biotech for health
  - Prevention
  - Platform for the development of new care system and pharmaceutical remedies
- *ENERGY AND ENVIRONMENT*
  - Mobility
  - Materials for building trade and energy saving
- *FOOD*
  - Agricultural production and environmental impact

- *MANUFACTURING PROCESSES*
  - Aeronautics and mechanics
  - Advanced materials

On each of these issues, the Lombardy strategy is working towards the following directions:

- Attract and facilitate establishment of high value-added production activities;
- Develop current human resources and recruit young talents;
- Promote the relationship between enterprises and research centres and support the world of research through partnership agreements;
- Stimulate investments in businesses involved in research and development, making use of natural conditions and creating a harmonious context;
- Create networks with foreign countries or other Italian regions

## 3 Innovation for welfare, health and security: how does I4W fit in?

Innovation4welfare will support the Lombardy region to achieve objectives and results expected by the regional strategy by helping to:

*Encourage the development of a network and competitive centres of excellence*, taking advantage of a system of evaluation/accreditation of the centres of research and technology transfer that leverages selectivity to focus on continuous improvements in the quality of the system and the processes of transfer (e.g. the Question system and support to centres of excellence);

*Increase the attractiveness of the Region* in terms of financing researchers, infrastructure/open lab (e.g. nano-medicine centre and open lab on new materials) and technological centres of excellence. Having in mind that the main target of I4W is the creation of new business opportunities, enterprises are strongly invited to participate to I4W subprojects, expressing their interest in the final outputs even if not eligible for funding. All these subjects work together in research and technology transfer in order to support international exchange and become more competitive with other European and non-European regions;

*Start-up partnership actions, alliances, and signing additionality agreements* of resources and efforts in order to expand investments and contribute to creating a cohesive image that includes institutions open to citizens acting as facilitator bodies (focus of I4W are ageing population, sick people, children, people with disabilities etc.). Bodies governed by public law such as CNR, universities, research organizations, public institutions etc., participate to the cooperation subprojects together with at least three I4W partner regions.

The Government of Lombardy Region fully supports the I4W initiative as the proposed actions entirely meet its research and innovation priorities. This is also confirmed by Regional Economic and Financial Planning Document, which sets the regional strategic guidelines for the period 2008-2010. In this perspective there sure is a mid- to long-term commitment in dealing with the issues tackled by the project and results carried out by the financed subprojects will then be taken into account in the definition of future regional policies.

# *Noord-Brabant*

## 1 Regional Innovation Policy in Noord-Brabant

In Noord-Brabant, Innovation 4 Welfare is part of the regional innovation policy, which is called "Dynamic Brabant". The aim of this policy is to strengthen the position of Noord-Brabant as one of the innovative key regions within Europe. In order to strengthen this position, Dynamic Brabant supports a more active translation of knowledge and competencies into innovative new products and services by the regional SMEs. The regional innovation policy stresses the fact that not all the necessary knowledge and competencies are available in Noord-Brabant: it is important to build international networks and projects for the benefit of product and service development within the SMEs on an internationally competitive level.

## 2 Innovation and key issues

The focus is thus on more innovation by the regional SMEs, individually and in clusters of SMEs, large companies and knowledge providers. This is however only one side of the coin: another key challenge of the Dynamic Brabant programme is to link innovation in SMEs with a number of major issues in society.

In the next decades Noord-Brabant, like every other region in Europe, will face a number of societal challenges that cannot be solved by existing, traditional solutions. Examples are the need for new sustainable sources of energy and the increasing demand for more and better health care related to the ageing population and to welfare related chronic diseases.

The Dynamic Brabant programme aims to harness the development power of knowledge centres and SMEs to create new innovative solutions for these issues in society. This approach will create double benefits: it will help us to deal better with the societal challenges AND it will create new business opportunities for the SMEs.

## 3 Innovation for health care and welfare: how does I4W fit in?

The growing demand for more and better health care which is related to the ageing population and to welfare related chronic diseases is one of the societal challenges in Noord-Brabant which is increasingly linked to the development power of SMEs. In the past few years Noord-Brabant experimented with this approach in its Regional Programme of Innovative Actions: "Innovative Solutions for an Ageing Population". This has been a successful programme (it has won the 2008 Innovation Award of the Assembly of European Regions) and it has led to a lot of new coalitions between the business world, knowledge institutes and the world of health care and welfare. See also the English page on the website http://www.innovatieveactiesbrabant.nl/

Noord-Brabant sees the Innovation 4 Welfare project as an international extension of this successful approach (albeit not exclusively focussed anymore on the ageing population), bearing in mind that we need access to international knowledge and competencies which are not available in our own region.

We hope that Innovation 4 Welfare will:

- Create concrete innovative concepts which can (eventually) be applied by SMEs
- Build sustainable international clusters which will enable more international interactions between the business world, knowledge institutes and the world of health care and welfare
- Give new policy insights (based on good practices, exchange of knowledge and the practical results of the project) about how to stimulate successful cross links between the economic world and the world of health care and welfare

In Noord-Brabant, participating knowledge centres and SMEs can be part of the two strong research driven clusters of institutes and companies in the field of medical technology and pharmaceuticals/biotechnology, but they can also be part of other strong regional clusters, like the design cluster and the high tech systems and materials cluster.

Together with other building blocks (like the RPIA programme, the regional "Smart Care" programme and the Interreg 4C "PEOPLE" project) I4W will be evaluated at the end of the current policy cycle. The results will be used to create new policies in the next policy cycle.

# *South West Bohemia*

## 1 Regional innovation policy in NUTS II

Region NUTS II Southwest is little bit specific because this region consists of from two independent NUTS III regions – The Region of South Bohemia and The Pilsen region. According to the governmental structure in Czech republic, the regional governments are copying the NUTS III structure, which means the regional framework of the implemented project is framed by the regulation, policies and strategies of the Czech republic legislation and specifies defined by both regional governments.

The main strategic document of The Region of South Bohemia is Regional development program of South Bohemia region 2007 – 2013 (RDP SBR). The content and aims of Innovation 4 Welfare are in accordance with goals of priorities focused on economic development and knowledge economy, human resources development, social and health care and quality of life.

Specifically based on the RDP SBR there is defined:

- Medium-term plan of development of The Region of South Bohemia social services which defines clearly the mid-term strategy for development of the social services affecting the innovation in that field as well
- Regional innovation strategy of The Region of South Bohemia 2007 – 2013, which is general clearly defined the strategy for innovation for this region

The main strategic document of Pilsen Region is Regional development program of Pilsen region (RDP PR). The content and aims of Innovation 4 Welfare are in accordance with goals of priorities focused on SME and innovation, human resources development, social and health care and quality of life.

Specifically based on the RDP PR there is defined:

- Medium-term plan of development of The Pilsen region social services which defines clearly the mid-term strategy for development of the social services affecting the innovation in that field as well
- Bohemian regional innovation strategy, which is general clearly defined the strategy for innovation for The Pilsen region

## 2 Innovation and key issues

Region NUTS II is facing, and will face more and more in future, increasing demand for better health and social care system, implementing and using new technologies, services and products. The number of elderly peoples or people with chronic diseases is growing. To solve this problem is the key issue.

The goals of both regional innovation strategies are:

- to strengthen potential of research and development as a source of innovation for economic benefits
- to find new innovative solutions which can increase competitiveness of both regions on an interregional level
- to strengthen participation of SMEs in applied research and development
- to strengthen cooperation amongst SMEs and knowledge institutions
- to develop and implementation of new technologies, products and services on the principle of cooperation amongst SME´s, knowledge institution public subjects (local authorities)

There is not available all needed knowledge and infrastructure in our region. This fact could be solved by setting up interregional cooperation, preparing and implementing project and establishing networks.

Welfare is very specific area. It is not only domain of public subjects and local authorities but there can be found many challenges and opportunities for involving SMEs and knowledge institutions and from this cooperation will region benefit.

## 3 Innovation for health care and welfare: how does I4W fit in?

Situation on the field of health care and welfare in NUTS II is:
growing number of elderly people which need health and social care
increasing cost of whole health and social care system
increasing demand of new technologies, products and services in health and social care system (especially in social care system)

According to this situation we are expecting from I4W project/subprojects this:

- to create new regional policies focused on welfare
- to set up network which will link universities, technologic centers, SME…
- to share good practices, knowledge and practical results of projects implemented in partner regions
- to stimulate practical cooperation between economic subjects (SMEs) and subjects which provide public services like social and health care is
- to capitalize on opportunities which welfare offer for further development of region NUTS II
- to develop new application, services or technologies which can be used in field of welfare

I4W project fully fits in current regional policies. In accordance to current situation in field of health and social care is this project apprehend as a tool or opportunity for creation of new regional policies in next programming period. We expect that this will be filled by subprojects and their results and give to regional authorities, participating subject and public new insight to field of welfare.

# *Upper Austria*

## 1 Upper Austrian regional innovation policy

The content and strategic aims of Innovation 4 Welfare are found in the "Innovative Upper Austria 2010" strategic programme which should position Upper Austria as one of Europe's leading regions for innovation. This foresees a strong economy as the driving force for Upper Austria's future and a source of employment, social security, prosperity and quality of life. The focal point of the programme is formed by a concentration of capacity on five main areas comprised by research & development, professional qualifications, networks, Upper Austria as an economic and technology location and EU networking. All five areas are concentrating on the development of European networks and projects for future benefits of Upper Austrian developments.
http://www.ooe2010.at/

## 2 Innovation and key issues

One major part of innovation in Upper Austria is the Upper Austrian Technology network.
On one hand, the technology network was expanded with numerous facilities in the areas of education and further training, R&D, technology transfer and regional development, while on the other hand, the cluster initiatives (branch networks) form a basis for a new culture of co-operation amongst large, medium-sized and small companies, research and educational bodies. Health and Welfare is one of the top 10 future challenges and will be found in all 5 strategic areas of the Upper Austrian strategic programme:

Research & Development: In future, Upper Austria will concentrate on five research areas: mechatronics, information and communications technology, life sciences, innovative materials, and logistics.
Professional qualifications: Education is the key to a successful future and involves both modern scholastic and professional training and measures for life-long learning.
Networks: Upper Austria has positioned itself as the competence region for cluster initiatives and networks. A cluster-oriented economic and technology policy has been systematically implemented since 1998.

Economic and technology location Upper Austria: The creation and design of an attractive infrastructural framework is absolutely vital to the Upper Austrian economy. Due to the fact that location quality and attractiveness are closely linked, programmes must be developed in order to secure and consolidate the economic location in a sustainable way. Clear impulses must be generated and companies must be supported during the location and expansion process.
EU networking: In the European Research Area regional potential and dynamism are of immanent importance. For the implementation of innovative developments, which are being worked on by top research centres in networks, it is vital that in particular the long-term research cooperation of geographically neighbouring regions, or regions with the same profile, will be intensified.

## 3 Innovation for health care and welfare: how does I4W fit in?

All over Europe the demographic development and the economic crisis will pose challenges especially in nations´ health systems.
In the centre of the health care discussion are:

- The considerable increase of diseases
- The increase of the percentage of elderly people and the (home) care sector, as well as
- rising costs of the whole health system

To be in line with the Upper Austrian Programmes and to pass the future challenges in economic technological and society dynamics innovation has to be forced.
This means, to recognize and take the benefits:
In the whole health care system there is an increasing demand on new products and services. I4W and its subproject potentials are an attractive possibility to develop new applications and share ideas for new technologies which focus on the three main topics above.
Innovation 4 Welfare and its 6 European regions share their main potential organisations to cooperate in the topic of Welfare to offer the chance for interregional cooperation.

Main target for Upper Austria is the stimulation of innovation. The results of I4W and its subprojects will be used to create new policies in the next policy cycle.

# IV I4W GOOD PRACTICE IDENTIFICATION AND ANALYSIS

## *Introduction to Good Practices*

In the I4W project there have been carefully identified 12 Good Practices, 2 per each participating region. Good practices were selected based upon several factors:

- Innovativeness – what are the new ways they address problems and use technology
- Impact on human welfare – what are their applications and target beneficiaries
- Success – were tangible and measurable results produced that meet specific objectives
- Connection to regional priorities – how do they connect to regional policy
- Sustainability – what is required to start and maintain the practice
- Transferability – how easily can they be replicated in other operating environments

I4W took a very broad approach in defining a good practice, classifying them as a methodology, project, process or technique. Although there is overlap between the categories (9 of the 12 good practices identified by I4W are classified under 2 or more categories) there is some important differences between them.

A *project* refers to a comprehensive approach in which a set of interrelated tasks are executed (often over a fixed period of time and within certain cost and other limitations). These tasks may be carried out by organizations that are permanent or temporary, private or public, a single group or as part of a larger partnership. An example identified from I4W would be the *Home for persons with health handicap Osek* which operates in the Czech Republic which is a health care facility that focuses on care for mentally handicapped persons with affiliated health problems. No one specific thing makes a project a 'good practice' but rather it is a combination of factors that makes the project one that is worth replicating in other contexts. 8 of the 12 I4W good practices are classified as projects.

A *methodology* on the other hand, refers to a set of related broad principles or rules from which specific methods or procedures are developed. A methodology identified by I4W was Estonia's *eHealth Portal*, which is based upon the idea that the integration of information technology can be used to improve health care in many different ways. In the case of eHealth, this includes the tracking/storing of patient histories, registration of appointments and making this data available to medical providers in every facility in the country. 7 of the 12 I4W good practices are classified as methodologies.

A *process* refers to the sequence of interdependent and linked procedures which, at every stage, consume one or more resources (employee time, energy, machines, money) to convert inputs (data, material, parts, etc.) into outputs. These outputs then serve as inputs for the next stage until a known goal or end result is reached methodology consisting of several important processes identified as a good practice by I4W. Under this good practice, a conceptual development plan was developed to set objectives and specifies how to achieve them. Amongst other things, the plan include efforts to identify existing services in the region as well as the needs of providers and users of social care; define which services are in accordance with the needs of providers and users of social care; estimate costs for social care and evaluate demographic progress of the region. The intention of the plan is needed in order to shape future activities in social services development. 5 of the 12 I4W good practices are classified as processes.

*Techniques* are systematic procedures, formulas, or routines by which a task is accomplished. Techniques are similar to processes but represent the most specific type of practice identified for I4W. The Estonian Genome Project was classified as a Methodology, Process and Technique by I4W. Several techniques are identified, including specifying how quickly biological samples (venous blood) must be received by the EGP (within 36-48 hours), how they should be received (by special courier), how they should be processed (into 3 fractions, in the EGP laboratory and kept in the liquid nitrogen below minus 135 centigrade). Due to the specificity of techniques, fewer of them were identified than any other type of good practice (only 3 out of 12).

In analysing the good practices, information was collected and assessed in several categories to understand why the practice is worthwhile, effective and sustainable and how it could be effectively transferred to other regions:

- Identification of used technologies, types of application and groups of target beneficiaries
- A detailed description of the objectives, activities, issues addressed and background.
- Why the practice was selected including how it is unique and innovative.
- How the practice is connected to regional policy.
- Key factors that would enable a successful transfer of the good practice.
- A financial analysis to calculate the costs for development and sustainability, including the sources of financing used.
- A SWOT analysis of the strengths and weaknesses of the good practice as well as the opportunities and threats that could affect transferability.
- A comparison between the estimated and actual inputs required, outputs and results of each good practice in time.

Each good practice is summarized below, along with a description of the benefits derived and affiliated organizations involved.

## *Descriptions of Selected Good Practices*

| **eHealth Portal**<br>Estonia |
|---|
| **Description** |
| The eHealth Portal was created to increase the use of IT tools for the Estonian Healthcare system, which has been working to digitalize many processes since 2003. In 2007 efforts were aided greatly by the government's decision to change regulations concerning the supply of healthcare services which made digital data collection of patients possible. Inserting data began in autumn 2008 and today eHealth is one of the largest applications in Estonia that uses the national ID-card. eHealth has enjoyed wide support from the government, including financial resources and coordination. The government's willingness and ability to support the initiative has been aided by the open-mindedness of the Estonian general public to different digital solutions. The success of eHealth has also reinforced this openness as the public has witnessed the benefits of this and other initiatives including e-school, e-election, e-revenue, internet banking etc. Beyond acceptance of electronic solutions, the broader impact of eHealth is related to its ability to increase the effectiveness of the health care system and the quality of medical services provided to citizens. In particular, eHealth involves the following:<br><br>• *Digital Health Record* – Patient health histories are recorded so medical providers can quickly and accurately assess health circumstances which can be very useful during in making accurate diagnosis and treatment, especially during emergencies<br>• *Digital Registration* – Many health care providers used different programs (or none at all) to schedule appointments. This effort creates common standards for registration and connects electronic registration systems to a shared website that patients can use to book appointments.<br>• *Digital Receipts* – Offers quick and efficient processing of payments and reimbursements<br>• *Digital Archive* – Large data files of health care activity are kept which can be analysed to identify health outcomes and ways to reduce costs and improve care |

| Benefits |
| --- |
| *For the patient* – The healthcare service is improved on all levels – scheduling appointments through Digital Registration and paying for services through Digital Receipts are made easier. By linking patient information in a computerized system, a patient's history is accessible to all doctors, so patients must not undergo re-analysis each time they go to a new doctor. This decreases treatment time and increases accuracy in diagnosis which in turn improves patient outcomes and health.<br><br>*For the doctor* – Doctors have access to a more complete overview of the patient health history, previous visits, prescriptions, diagnoses, analysis results etc. All the information is quickly accessible and up-to-date, including critical information (e.g. allergies, organ donor decisions etc.). This information can be extremely important in emergency situations and can also avoid misdiagnosis or complications from treatment. |
| **Affiliated Organizations** |
| eHealth involves different institutions nationwide including:<br>• Ministry of Social Affairs – coordination<br>• Estonian eHealth Foundation – administration<br>• Estonian Health Insurance Fund – cooperation partner in digital receipts<br>• Hewlett Packard OY Estonian branch office – technical solution<br>• Microlink Eesti – technical solution<br>• Medisoft – technical solution |

| CRS: "Regional Services Card"<br>Lombardy |
|---|
| **Description** |
| The purpose of the CRS: "Regional Services Card" was to create an easy way for citizens to access public as well as private services via one personal 'smart card' issued to every citizen.. To develop such a system two approaches were taken. First the Smart card technology was developed, which includes the cards themselves and the online electronic network that is accessible and available to both citizens and operators. The second approach requires the creation of a network in which operators have the desire and infrastructure capability to use the cards. In the case of CRS, this was developed for the health care sector via the 'Healthcare Extranet', which links operators, social services, organizations and citizens together. The Extranet tracks all the events which occur in patient treatment (from prescription to administration) and provides value added services.<br><br>The main principles on which the project is built are:<br>• Web technologies (web services and web browsing).<br>• Integration, not replacement, of current application.<br>• Strict enforcement of data protection, security and privacy.<br>• Hiding project complexity from the operator.<br>• Lowest changes in day by day activities.<br>• Large deployment of digital signature and electronic documents |
| **Benefits** |
| Benefits of the CRS include the following:<br>• Improved information sharing and exchange amongst healthcare operators to improve quality of healthcare provision via referrals consultations, the prescription process, etc.<br>• Improved services provided to citizens such as fast access to accurate information and more convenient booking of appointments through an easy and secure computerized Healthcare System. |

- Simplification of administrative processes for healthcare providers through electronic prescription and electronic signature. This enables increased capacity and efficiency of providers.
- Aggregate health care information is available to health care administrators (total number of patient appointments, procedures, timing, cost, diagnosis and outcomes, which enables the monitoring and analysis of healthcare quality and expenditure.
- This information in turn enables better planning at the Regional level, greatly expanding the positive impact of the practice.

**Affiliated Organizations**

- The Regional Health Directorate General
- The Lombardy Integrata SpA (LISIT)
- About 90% General Practitioners and Pediatricians in the Network and issue prescriptions through CRS-SISS
- Certificate Service Providers such as Postecom S.p.A., Banca di Roma S.p.A, CNIPA - Centro nazionale per l'informatica nella pubblica amministrazione and IT Telecom S.r.L.

**Elderly people and the perception of food**

Noord-Brabant, Netherlands

www.innovatieveactiesbrabant.nl

ddejager@bom.nl

**Description**

In many hospitals and care institutions, elderly and sick people receive food that is unattractive or which simply lacks all the necessary nutritious ingredients. As a result, patients, especially elderly people develop poor eating habits that negatively impacts on their health. "Elderly people and the perception of food" was developed to address this issue by identifying promising areas for new products and services in the field of nutrition in residential care. In particular the objective of this project is to respond to how the appetite of the elderly in care can be improved so that they stay healthier, require less medical care and improve their quality of life. Through this project a group of 20 representatives of SMEs, knowledge institutes, food managers in hospitals and designers were brought together to devise a number of ideas for new products and services that would create more attractive and nutritious food applications and settings for hospitals and care institutions.

The key methodological element of this project is that the innovative activity is driven not by practitioners but by end-users, in this case the elderly consumers of food. This was accomplished via the use of films of the target audience which were shown to and discussed by the groups of experts. A new way of observing people in their "daily" surroundings by means of non-intrusive filming has been piloted. Clusters have been formed to work on concrete new innovative solutions.

As a result of the observations, five new solutions that address the improvement of hospital and institutional foods themselves, but also packaging, surroundings, logistics, etc. were started by various businesses. One of these includes a course designed for volunteers who provide meals and work with and for older people.

| Benefits |
| --- |
| • The methodology of filming "end users" and using these films as a trigger for SMEs, knowledge institutes, food managers and designers to come up with innovative new solutions has proven to be very successful.<br>• By focussing on the broader setting of people and food in hospitals and care institutions (not only the quality of food itself, but also packaging, logistics, servicing, perceptions, surroundings) solutions tend to be more far-reaching.<br>• The project led to an interesting spin-off: a "silverfood network" of large and small companies in the region |
| **Affiliated Organizations** |
| • The project is part of a regional programme (Innovative Actions Brabant)<br>• Co-funded by the regional government and ERDF<br>• Syntens, the regional innovation advisory service for SMEs<br>• a private innovation company (Innoflow)<br>• (students of) the Design Academy<br>• Healthy Food Innovation Centre<br>• Noord Brabant Development Agency (BOM)<br>• Limburg development company (LIOF) |

**Home technologies for people with early stage dementia**

Noord-Brabant, Netherlands

www.innovatieveactiesbrabant.nl

ddejager@bom.nl

**Description**

In the last decade a lot of technologies have been developed assisting people with dementia at home. However, these technologies are often implemented with a "technology push" meaning that they are driven by innovators and not the patients themselves. As a result, consumer needs are not always fully taken into account and might not be fully integrated with other home technologies and the demands of care suppliers and insurance providers.

The purpose of this project was to learn more of the direct needs of users by analysing the complete "care system" around a number of people with early stage dementia, so that ICT/domotics solutions can be carefully tailored and integrated with other technologies and services. Instead of 'pushing' the goal is to provide integrated products that are "demand pulled" by customers.

40 participants were chosen from a group of 270 people with psychogeriatric problems, all still living at home, but some receiving outpatient, day care and/or home care while some are on a waiting list for admission to a nursing home. For this group, technological solutions to specific problems were sought, working with patients and caregivers.

One element that was important to the success of the project was regular communication with the person with memory problems and his / her caregiver. This was crucial to allow adjustments to optimize the technological support to the clinical picture of the user. People with slight memory problems were obviously more capable of using new tools than those with severe learning difficulties. It is generally recommended that as early as possible technical tools be introduced to people. In fact, getting patients to use tools *before* their situation worsens is valuable.

| Benefits |
| --- |
| The project increases knowledge about what is needed to enable people with early stage dementia to live longer in their own homes. As a result, participants were able to:<br>• Provide integrated and tailor-made technology service solutions,<br>• Assist the family and the formal and informal caretakers surrounding patients.<br>• Uderstand which products are most valued by patients and caregivers, such as automatic lighting or calendar clocks as two examples.<br>• Integrate technological tools to increase the independence and quality of life of participants.<br>• Reduce the burden on caregivers in some cases.<br>• Gain insight into the financial interests of various stakeholders by closely monitoring investment and operating costs. |
| **Affiliated Organizations** |
| • Smart Homes Foundation in Eindhoven<br>• Care institution<br>• A number of engineering companies |

**Medical Field Lab/Living Lab**

Noord-Brabant, Netherlands

rhein@bom.nl

**Description**

Many worthwhile medical products that are developed fail because they never reach patients in hospital or other institutional settings. A major reason for this is that they are push-driven, meaning that innovators create the product and then attempt to market it to get end-users to purchase it. There are many negatives to this approach. For one thing, SME staff and medical providers often do not interact sufficiently so that developers understand the specific needs of medical providers. A seemingly minor detail on a piece of equipment may make it difficult or inefficient to use. Furthermore, because the technology is often being 'pushed' a great deal of effort must be spent on marketing products to medical providers who are unaware of them. Above and beyond the negatives of producing a product that is underutilized is the opportunity costs of time and money that could be spent on developing other products. Considering how expensive and long it often takes to develop innovative products one poor performing product could have serious negative impacts on an SME. Even when they do interact, differences in culture between care-institutes and innovation companies can weaken product development.

The Medical Field Lab (MFL) attempts to overcome these issues by offering a creative workshop in a hospital environment, where different partners can work on new medical applications and / or products. The lab works with a regional network of companies and knowledge institutions engineers, scientists, technicians, researchers and medical specialists to quickly combine and apply knowledge and skills in specific life science cases. Activities in the MFL concentrate on developing market-oriented products relating to health, with economic, social and scientific value being central. The MFL is accessible and provides opportunities for 'à la carte' support. This support can range from medical expertise, scientific guidance, facility sharing, project management and legal advice. The MFL is an independent body within Maastricht UMC+. The MFL has fifteen on-going projects with a project volume of € 5 million.

| Benefits |
| --- |
| Better and more market-driven products as a result of:<br>• A living lab of target groups, where companies can test and try out their products, get feedback and make necessary improvements.<br>• Specialists and patients get involved in the product-creating process so products fit demand.<br>• Increased contact with SME's and their clients, such as hospitals or other medical care facilities<br>• A skilled intermediary who understand both cultures can ensure that increased interactions will close the culture gap between companies and care-institutes<br>• As a result, products in the bio-tech industry will reach the patient instead of being boycotted by specialist or doctors.<br>• As the development process is improved (and thus reduce costs in relation to revenue), more innovative products can be produced<br>• Benefits can expand outside the immediate region by disseminating information to a wide range of companies and institutions nationally |
| **Affiliated Organizations** |
| • There is a Living Lab close to the academic hospital in Maastricht called the Medical Field Lab.<br>• There is also a Living Lab close to a care-institute in Tilburg (De Wever)<br>• SME's that use the labs to test products |

**Home for persons with health handicap Osek**

South West Bohemia, Czech Republic

www.dozp-osek.cz

**Description**

The issue addressed by this Good Practice is to provide social care services for mentally handicapped men with affiliated health problems. It is done through a facility, which was founded in 1955 and renovated with a number of technological improvements to enable a wide variety of activities.

These include rehabilitation such as underwater massages, whirlpool, a sliding bottom pool (which allows arbitrarily set the depth of water to help with musculoskeletal functions), magnetic and ultrasound therapy, inhalation for asthma, laser therapy flask a fully equipped gym (with fitness machines, balance platform, orthopedists and ribstole). Handicapped users are also able to use two MOTOmed (engine supported therapeutic motion device) to practice the less mobile upper and lower extremities. Modern gym equipment also gives space for entertainment and sports. A wide rang of other therapeautic have been improved by better facilities including Art Therapy (music, drawing, handicrafts, ceramics and painting); occupational therapy; woodworking; hippotherapy and gardening.

Key factors in the success of the renovations and the project as a whole has been:

- to establish contact and partnership with foreign partners
- to gain political support for increasing of financial means
- Unchallenged administration which has been enabled by the independent funding source
- Implementation of improved or new services
- Integration of innovation technologies into the facility to improve specific elements of rehabilitation and therapy
- Qualified personnel
- activities of this facility are in accordance with policy of The Region of South Bohemia, Act on social care and with Medium-term plan of development of The Region of South Bohemia social care services

| Benefits |
| --- |
| • Expanded capacity of facility (serving more people and providing a wider range of services to people with more diverse needs)<br>• Improved quality of life for people living in this facility<br>• Better rehabilitation care and other specialized services for patients<br>• to find eligible partners to transfer of experience/processes/methodologies/ technologies |
| **Affiliated Organizations** |
| • Home for people with health handicaps (OSEK)<br>• The Region of South Bohemia |

**Medium-term plan of development of The Region of South Bohemia social services**

South Bohemian Regional Authority

http://www.kraj-jihocesky.cz/

South West Bohemia, Czech Republic

**Description**

The main strategic document of The Region of South Bohemia is the Development programme of The Region of South Bohemia. This program defines fields of interest and objectives for various target groups, including the physically or mentally handicapped, pensioners, children and young people, the unemployed, persons in a temporary social crisis, and, as an element in crime prevention, persons addicted to drugs and other substances.. One of these fields of interest is social care. To achieve its objectives it was necessary to process a conceptual development plan. The plan includes descriptions of processes which should consider the needs of providers and users of social care. Based upon this, representatives of The Region of South Bohemia decided to set up a partnership with The College of European and Regional Studies, which was processor of the plan, to process the Medium-term plan.

Issues addressed by the plan include:

- Social care services offered in accordance with needs of target beneficiaries and the Act on social care and local conditions
- To ensure that services are provided equally and fairly
- Prioritises activities in addition to identifying them
- Clearly describes current and future situation in social care services

Factors for success of the practice include:

- Cooperation amongst the Region of South Bohemia, municipalities and providers of social care services
- the plan defines strategy and steps to take to carry out the plan
- The medium term of the plan is important because it offers enough time to realize innovation activity
- Considers demographic shifts and summarizes expectant cost for social care based on professional estimation in designing plan

- Uses the methodology of the community planning in designing the plan
- Uses examples of Best Practise from partner countries

**Benefits**

- Improves social welfare and thus quality of life of citizens affected by the plan
- Social care services that meet citizens needs and are performable by social care providers
- Identifies and/or allocates sufficient amount financial support for development of social care services
- Identifies important processes for social welfare development

**Affiliated Organizations**

- This Good Practice is operated by
- South Bohemian Regional Authority – Department of social affairs and health.
- The College of European and Regional Studies will help implement the plan
- Over 50 municipalities, social services providers and users gave input into the plan

**Catalan Technology Transfer System with Welfare impact (CTTS)**

ACC1Ó – TECNIO

Catalonia, Spain

http://www.acc10.cat/en/technology/tecnio/

tecnio@acc10.cat

**Description**

The Catalan Technology Transfer System (CTTS) is the main instrument designed at the Catalan Regional Level to support processes of transfer of technology from universities and R+D centres to the market. The CTTS is supported by the Catalan Government which implements different formulas to reduce the gap between the creation of knowledge and the commercialization of technology by Catalan companies. Currently the CTTS is composed of more than 100 R+D centres in all technology fields (including health technologies). There are 36 Centres providing R+D services to health companies. R+D and Technology Development projects are the most demanded services from companies. The Catalan regional government supports big impact collaborative R+D projects amongst CTTS centres and companies. In carrying this out, CTTS addresses the need to apply several technologies (mobility sensors, wireless networks, automation and control electronics, virtual reality and remote monitoring applications) to health fields such as neuro-rehabilitation.

**Benefits**

- Creation of the CTTS and design of supporting mechanisms to facilitate transfer of technologies
- Identification of Technology Offer From the Centres who are members of CTTS and Identification of Technology Demands from Catalan Companies
- Matchmaking Methodology to satisfy technology demand Definition of cooperation projects
- Protection, valorisation and applicability of research: Strategy of protection of intellectual and industrial property of research and evaluation of applicability of outcomes to other environments of therapeutic assistance.

| Affiliated Organizations |
| --- |
| • Catalan Government (leader and primary funder)<br>• Neuro-rehabilitation Project.<br>• ACC1ó<br>• Fundació Privada Institut De Neurorehabilitació Guttmann<br>• Fundació Privada Cetemmsa<br>• Universitat Politêcnica De Catalunya<br>• Fundació Barcelona Digital<br>• Hand Help Health Sl<br>• Gem Med Sl<br>• Nte Sa<br>• Artesana De Clofent Sa |

| Estonian Genome Project, University of Tartu (The Estonian Biobank )<br>Estonia |
|---|
| **Description** |
| The idea of the Estonian Genome Project was put forward in 1999 by the Estonian Genome Centre Foundation; in 2000 the Human Gene Research Act was approved by the Estonian Parliament (Riigikogu) and in 2002 data collection started after fundraising by the private company EGeen Inc., who in most part financed the collection of the first 10 000 gene donors and infrastructure build-up. After the separation from the private company due to the funding difficulties, the Estonian government transferred the EGP foundation into the structure of the University of Tartu and started to provide finances.<br>Issues addressed: Transparent legal and financial situation, excellent ethical principles, sound scientific design and openness for scientific cooperation. |
| **Benefits** |
| Objective of the EGP of UT is to develop one of the best biobanks in Europe and to provide a research infrastructure for the studies concerning causes and mechanisms of the common complex diseases. |
| **Affiliated Organizations** |
| • The Estonian Genome Project Foundation<br>• University of Tartu.<br>• EGeen International Corporation – for profit corporation formed to access additional funds and deliver tangible pharmaceutical/health care products. |

**Project Teleictus : Stroke Care Through A System Of Telemedicine**

Foundation TIC-Salut

Catalonia, Spain

http://www.gencat.cat/salut/ticsalut/

lluis.tarin@ticsalut.cat

**Description**

Teleictus aims to improve the treatment of stroke. The cerebral stroke is a disease of sudden onset in which immediate intervention is critical to prevent serious sequelae, such as disability or dementia. The earlier thrombolytic therapy is administered, the best time is a maximum of three hours, may be more beneficial for the person concerned. The common risk factors are arterial hypertension, atrial fibrillation, diabetes, dyslipidemia and coronary disease. Strokes require urgent attention by neurologists in order to reduce the side effects of the disease in Catalonia, which causes 9.2% of overall mortality (7.5% in men and 11, 1% in women).

The autonomous region of Catalonia with a population of roughly 7 million inhabitants has, since 1981, full competences in health services, as part of the decentralized Spanish health system, based on the common principles of universality, equity and gratuity. The central government collects public taxes and social security contributions, and transfers the budget to the Regions. This allows more effective resource allocation in response to the socio-demographic and cultural characteristics of each autonomous community and to achieve a more balanced development of the country's health services.

The budget transferred to the Catalan region represents the 16,27% of the national expenditure in healthcare. The Catalan government (Generalitat de Catalunya) has developed its own organizational model based on the historical evolution of the Catalan health system, where only 30% of the resources in the public network were directly owned by the government (through the ICS, National Health Institute, the biggest provider in Catalonia), while the other 70% was owned by foundations, mutuality and other private non-profit authorities. Therefore, the Catalan health care model establishes the separation of functions, purchasing-providing, based on harmonized agreements and tenders. Issues addressed: Within the Department of Health of the Generalitat de Catalunya (DSGC) the TIC-Salut Foundation aims at the

full incorporation of the Catalan health system into the society of knowledge.
At pilot project of the Teleictus, neurologist at the Hospital Vall d'Hebron can see the patient at the Vic Hospital in real time, as well as radiological images, and can to apply thrombolytic therapy immediately if is indicated. In this way can avoid a transfer that may be prejudicial to the sick person.

**Benefits**

- Reference and regional hospitals are connected to enable the neurologist of the reference center to visualize, in real time, the radiological image of the patient and to evaluate and indicate the appropriate therapy to patients during the first hours of the acute phase of cerebral stroke.
- Introduces the newest technological applications in the health area which make the transfer of knowledge easier for health centres and professionals.
- To promote the movement of information before the movement of people, getting the highest degree of efficiency in the diagnosis.
- Disseminate and implement the standards that allow interoperability between all systems.
- A reference centre in Catalonia is developed via networking with entities in Spain, Europe and around the world.

**Affiliated Organizations**

- Vic Hospital
- Vall d'Hebron Hospital
- The TIC-Salut Foundation and different actors of health sector.
- Ministry of Health of the Generalitat de Catalonia
- Foundation i2CAT

**"Upper Austrian Health Cluster"**

Health Technology Cluster, Clusterland Oberoesterreich GmbH

Upper Austria

http://www.gesundheits-cluster.at/index_ENG_HTML.php

**Description**

The main activities of the Health Cluster are focussed on the development of the existing strengths of national companies as well as guaranteeing long term competitiveness. Therefore the mayor challenges such as cost pressure, over capacity, price decreases and shorter production and innovation cycles can be successfully dealt with.

Issues addressed:

- Improved the quality of products
- Improved relationships with major customers
- Adopted new technologies or new manufacturing practices

The health cluster supports and consolidates companies operating in the fields of:

- Medical equipment and appliances
- Medicinal supplies and pharmaceutical compounds
- Specific installations and institutions
- Services
- R & D, Training

**Benefits**

Development of new products or services

At the core of the cluster activities is the strengthening and expansion of the medical technology sector and the cooperation of companies and healthcare institutions by:

Special Events and Fairs, Qualification projects, Cooperation projects amongst companies and R&D Institutes, EU – Projects

Support Services for companies

- export oriented region
- Innovative SMEs
- Cluster Company Database

- Network of institutions
- Building social capital
- Growing fields in new technologies
- Company oriented services
- Special trainings on demand

**Affiliated Organizations**

- The Health Technology Cluster is a Network within Company:
- Clusterland Upper Austria. Which is a company financed by public funds.
- 222 producers, suppliers, service providers and business partners in network (more than 90% SMEs)

Strategic Innovation Partners:

- Ernst & Young accounting firm mbH
- FH Biomedical Engineering
- GS 1 UK Ltd.
- Austrian hospital newspaper
- Quality Austria Training, Certification and Evaluation Ltd.
- Volkskreditbank AG

**"Linear accelerations and otolith-induced postural responses"**

Upper Austrian University of applied Sciences, Campus Linz, Medicine Technology

Upper Austria

http://cometo.eduhi.at/MyHome/regins/

**Description**

The mechanics of the human neck are of eminent importance for car safety: the results of whiplash-syndroms cause in Europe alone yearly costs in the order of 1 billion €. The REGINS project "Loto" (*Linear accelerations and otolith-induced postural responses*) aims at a better understanding of the mechanics and the postural reflexes of this part of the human body.

A realistic model of the head and neck needs to incorporate the mechanics of bones and muscles, as well as the postural reflexes that control the muscle tension. Loto plans to develop such a model by building on the results of existing research. The Biomechanics Group at Physics Department in Tübingen has developed a "multi-body-dynamics" models of the human body, which has so far been applied to the mechanics of the arms, legs, and pelvis. *Loto* will extend this program to include the mechanics of the human head and neck. For a realistic simulation of the sensory input to the neck muscles, a finite-element (FE) program will be used which has been developed to simulate the effects of accelerations on the balance system. To avoid the high costs of proprietary FE software Loto plans to use open source software. This, combined with efforts to inform local SMEs about the research results, will help make these results available to local SMEs in the areas of mechanical modeling.

The car producer Daimler-Chrysler collaborates in this project and will provide experimental data on the movements and forces that occur during driving a car, which will ensure that the modeling will focus on realistic conditions that occur during the driving of cars and during accidents. Additional data, which will be necessary to determine the appropriate mechanical parameters for the model, will be collected by the Computer Engineering and Systems Science Department of the University of Pavia.

A realistic biomechanical model of the human, which also covers the effects of postural reflexes, would be very helpful in improving the design of seats in cars, trains, or airplanes, notably to optimize the design of head-rests, which help to minimize head and neck injuries during accidents. It could further be used to improve seats and dampers in general since driving comfort is strongly influenced by an adequate relation between car damping and neck mechanics.

**Benefits**

- Disseminate the knowledge of advanced mechanical simulations
- Reduced overhead, by substituting expensive technologies (mainframe computers and proprietary software) with readily available alternatives
- Increase the knowledge transfer from academia to industry, and
- Conduct a case-study on the feasibility of quantitative simulations of realistic human mechanics
- Direct link between research and SMEs, transferability of results and software and the human health is in the centre of interest
- Cost reduction for insurance

**Affiliated Organizations**

- Upper Austrian Research - Department of Medical-Informatics

As well as several regional players on a policy level as well as on operative level including:

- Uni Tübingen - Institute for Astronomy and Astrophysics & Computational Physics
- Uni Pavia Department of Computer and System Laboratory of Bio-engineering
- Daimler Group to apply the results to the improvement of car safety and comfort.
- Other Universities, Students, Research Institutes and SMEs

**Translational Research Program In Neurorehabilitation**

Guttmann Institute

Catalonia, Spain

http://www.guttmann.com/

investigacio@guttmann.com

**Description**

The mission of the Guttmann Institute is to develop education, scientific and research aspects in the area of neuroscience in general, and neurorehabilitation and technologies applied to personal independence in particular. Collaboration between the hospital - Excellence centre - and the further education institute - Knowledge centre - allows for the optimization, generation and transfer of new expertise in this specialized scientific area. The basic function of the research unit of the Guttmann Institute is to *optimize the generation and transfer of knowledge* in the field of neurorehabilitation from the systematization of clinical act and methodological rigor. The potential clinical and translational research at the Institute Guttmann is based, on one hand, the *concentration of a sufficient number of cases* that can maintain and develop our professional expertise, while ensuring the *safety, quality and care efficiency*, for Moreover, the exercise is based on a model of systematic and rigorous work ethic, based on *scientific evidence* and *accurate monitoring* of the *scientific method*. Thus, the *systematic care* of the act itself becomes an exercise in *ongoing clinical research*, which boosts the generation *of new knowledge*, while driving *continuous improvement of healthcare quality* of services offered by the hospital. It also helps promote *specialized training* from experts in the field of neurorehabilitation and technologies applicable to disability, while enabling the promotion of knowledge of techniques and experiences that promote health and quality of life of people affected by a large acquired neurological disability.

**Benefits**

The Guttmann Institute has become one of the most advanced hospitals and international reference in its field thanks to these circumstances, and with its institutional culture, its own methodology of work, strong commitment to modernity, innovation and quality in their services, teaching and research potential, the friendly staff and all his team, comprised of more than 400 professionals, and more than 14,000 patients

treated and their strong social commitment. Since 2002, The Guttmann Institute has made a total of 129 research studies, has published 108 scientific papers in indexed journals that have an added impact factor of 319.11, has prepared 564 papers for various scientific meetings and has worked in 28 doctoral thesis. Guttmann Institute effectiveness lies in its method of work and proper functioning of the rehabilitation team which adds to their ability, motivation and experience the complicity and participation of patients themselves and their families.

A rehabilitation team is assigned to every new patient admitted to the hospital, composed specifically for him, formed by a rehabilitation physician who will coordinate the team, a nurse from the inpatient unit where it is located, a physiotherapist, an occupational therapist, social worker and a psychologist or neuropsychologist, the latter depending on whether the unity of the spinal cord or brain damage. These professionals are responsible for the entire patient care process, regardless of other professionals will also be involved in his or her treatment.

**Affiliated Organizations**

- Laboratory for Magnetic Brain Stimulation - Harvard Medical School, Harvard University. (Boston, USA). http://www.harvard.edu
- Universidad de Morelos – Mèxico. http://www.umc.edu.mx
- McGill University – Canada. http://www.mcgill.ca
- Klinik Berlin – Freie Universität – Alemanya. http://www.mcgill.ca
- Uniklinik Balgrist - Zurich Universität, Suïssa http://www.balgrist.ch
- Sensory-Motor Integration Center. Aalborg, Dinamarca. http://www.smi.auck.dk
- Fondazione Santa Lucia. Itàlia http://www.hsantalucia.it/eurocup.htm
- Miami Project to cure paraliyis. Miami, USA. http://www.miamiproject.miami.edu
- Centro Nacional de Microelectrónica (CNM) del CSIC, Barcelona. http://www.cnm.es
- Universitat de Barcelona (UB). Barcelona. http://www.ub.es
- Centre de Recerca d'Enginyeria Biomèdica (CREB). http://www.creb.upc.es
- Institut de Neurociències, Universitat Autònoma de Barcelona http://inc.uab.cat/
- Fundació Institut d'Investigació en Ciències de la Salut Germans Trias i Pujol, Universitat Autònoma de Barcelona http://www.germanstrias.org
- Fundación FATRONIK http://www.fatronik.com

- European Multicenter Study of Human Spinal Cord Injury - EM-SCI- http://www.emsci.org
- Universitat de Girona http://www.udg.edu
- Fundació Eduard Soler http://www.fes-etr.org
- TecnoCampus Mataró http://www.tecnocampus.com
- Universitat Rovira i Virgili http://www.urv.es

## *Site Visits*

In paralell with the good practice identification all the I4W partners also arranged site visits to the organisations which were either part of the identified good practice cases or relevant otherwise to the project context. Alltogether 6 site visits were organised one in each region and this provided additional possibilities to understand the regional context and possible areas for future cooperation during the subprojects. The following is the short summary of the study visits organised:

**Site visit 1: Guttmann Institute (Barcelona)**

The first I4W site-visit was organised in the framework of the kick-off meeting on the 4th December in 2008. All the attendees to the kick-off visited the Guttmann Institute, a research institution and hospital of international relevance located in Barcelona, where several technological development projects to increase the quality of life from the medullar injured patients were presented. http://www.guttmann.com/

**Site visit 2: Eindhoven High Tech Campus (Eindhoven)**

During the Technical Committee meeting on 2 and 3 February 2009, the Innovation4Welfare partners visited the Eindhoven High Tech Campus. This campus has evolved around the former R&D facilities of Philips and is currently one of the main Dutch innovation hotspots, based on an international open innovation concept. On the campus, new technologies are developed related to personal health and well-being. A project manager of the EHTC, Marcel de Haan, delivered an extensive presentation about the development and future plans of the campus. After this presentation the partners were given a tour around the campus by bus. http://www.hightechcampus.nl

**Site Visit 3: OSEK (České Budějovice)**

The participants of Launch Event, hosted in České Budějovice (South Bohemia region) in May 2009, agreed upon a third site visit to the home of handicapped males "OSEK". Founded in 1955, "OSEK" provided care for people with affiliated health problems and after its reconstruction and facility improvement during the years 2000 - 2002, further

qualified staff was employed. Therefore, enhanced rehabilitation opportunities, deepened care and therapy possibilities, as well as the option of educational training for its clients, amongstst others, led to higher reputation of "OSEK" and to a continuously growing public awareness. In this regard, it was our will to introduce "OSEK" to the participants of the Launch Event in order to demonstrate the improved situation for handicapped people. http://www.dozp-osek.cz

**Site visit 4: Estonian Genome Foundation (Tartu)**

The fourth Site Visit was held during I4W workgroup meeting in Tartu, Estonia in July 9th 2009. Estonian Genome Foundation is a research venture of the University of Tartu. The aim of the EGF is to create a database of health, genealogical and genome data representing 5% of Estonia's population. The database will make it possible for researchers both in Estonia and outside Estonia to look for links between genes, environmental factors and common diseases (cancer, diabetes, depression, cardio-vascular diseases, etc.). Currently there are over 41 000 donors in the database and it is estimated that the goal will be achieved within next couple of years. http://www.geenivaramu.ee/index.php?lang=eng

**Site visit 5: Ars Electronica Center (AEC) and AEC Futurelab (Linz)**

Ars Electronica Center (the Museum of the Future as well as AEC Futurelab) was visited around the 4th TC meeting in Linz. As AEC deals with the interrelationship of art, technology and society and has a special focus on Life Sciences, future issues, e.g. in the fields of neurosciences (perception, emotions, imaging), molecular biology and robotics could be presented to the TC participants in a special guided tour. http://www.aec.at/index_en.php

**Site visit 6: Museo della Scienza e della Tecnologia – Leonardo Da Vinci (Milano)**

During the meeting held in Milan from 10th to 12th of February, Innovation 4 Welfare partners visited "Museo della Scienza e della Tecnologia –Leonardo Da Vinci". First of all partners have been engaged in the experience of the interactive labs by discovering the new nutrition lab, since food is one of the priority area of the project, and then they discovered Leonardo Da Vinci world.
http://www.museoscienza.org

# V I4W SUBPROJECTS

## *Introduction to I4W Subprojects*

Perhaps the most important component of the I4W project is the eight subprojects that have been selected for funding. The purpose of the subprojects is to enable the transfer and implementation of good practices within the various regions in an effort to address the priorities for innovation established within each participating region.

Calls for proposals were issued in autumn 2009 and the 8 subprojects were selected by spring 2010. A total of 18 proposals were submitted requesting a total amount of just over 6 million euro. Proposals were submitted by groups made up of different partners from the six participating regions in I4W. The table below indicates the total submitted for each and the number in which the regional organization was the lead or coordinating partner of the subproject.

| **Region** | **Total Requested Grant Amount** | **Number of Proposals Submitted/ Coordinated and Awarded** | | | |
|---|---|---|---|---|---|
| | | Submitted | Coordinated | Awarded | Coord (from awarded) |
| Catalonia (ES) | € 1.824.438,00 | 16 | 7 | 6 | 3 |
| Lombardy (IT) | € 1.632.492,00 | 15 | 4 | 8 | 2 |
| Noord Brabant (NL) | € 970.645,00 | 10 | 2 | 5 | 1 |
| South West Bohemia (CZ) | € 308.635,00 | 5 | 1 | 5 | 1 |
| Upper Austria (AT) | € 1.003.528,01 | 12 | 4 | 6 | 1 |
| Estonia (EE) | € 507.047,75 | 8 | 0 | 6 | 0 |
| Total | € 6.246.785,76 | 66 | 18 | 34 | 8 |

For the 8 selected subprojects, the following objectives have been set:

- Subprojects are expected to produce improvements in at least 8 existing methodologies and strategies for welfare-related innovation policy.
- Through support by project partners and the Advisory Group this will lead to at least 6 good practice policies being transferred between regions in the project.
- Through an intensive dissemination campaign, including 3 high-profile events a large variety of dissemination material and the continuously updated project website, the project will create awareness amongstst policy-makers and experts from at least 90 other regions in Europe of the good practice methodologies developed and exchanged in the project.

Following are brief descriptions of each of the eight selected subprojects, indicating how long they are planned to last, who their partners are, what the innovation technology being used is, what the application of the technology is and who are the targeted beneficiaries.

## *Descriptions Selected Subprojects*

| | |
|---|---|
| Sub Project Abbreviation Name | **FITREHAB**<br>**Fitness And Physical Rehabilitation At Home Under Expert Planning, Prescription And Control With Deployment Of Telemedicine Solutions**<br>http://www.innovation4welfare.eu/287/subprojects/fitrehab.html |
| Length of Sub Project | 18 Months |
| Innovation Technology | ICT |
| Application of Technology | Medical and home care systems |
| Targeted Beneficiaries | Sick people (At home), Chronic diseases, Ageing population |
| **Objectives** | |
| The FITREHAB subproject will integrate and field test a new and innovative virtual reality based rehabilitation and training platform, which will allow patients and medical discharged people to perform physical exercises at home under remote expert planning and monitoring. The main objective is to perform a field test of such platform to assess its clinical efficacy, development procedure within the existing infrastructure of hospitals, and benefits for the national health systems in terms of costs and performance.<br><br>Nowadays, there is a real need for platform of this kind. Chronic patients, disabled and recently discharged must do physical exercise regularly, either to keep healthy or rehabilitate. However, national health services are overly saturated to provide the monitoring and supervision these patients need. Therefore, most of them do not practice any physical exercise because they fear it could be more harmful than beneficial. A platform like proposed one will allow hospitals and health services in general to provide such assistance, without increasing either work overhead or budget. | |

The proposed platform will consist of two integrated stations. The first one will be used at hospitals by the medical staff to schedule a customized program of exercises to each patient. The second station will be used by the patient at home to do fitness with a virtual environment as a trainer. The movements of the patient will be tracked in the virtual environment. The patient will be prompted to follow a plan of exercises. Besides movement sensors, biological ones will also be attached to the shirt, in order to monitor heart rate, temperature and breathing effort. All this information will be sent back to the station in the hospital, where the medical staff will review it and adapt the scheduled program if needed. In this way, the patient is always under supervision and the treatment can be adjusted and customized to fit the specific needs of each patient.

Although telemedicine platforms of this kind have been already proposed and there are some working prototypes, an exhaustive study about their clinical efficacy and an assessment of their benefits in a real deployment has not been done. FITREHAB will fill this gap conducting an exhaustive field test of the platform in two reference hospitals of different EU regions, using functional rehabilitation as a case study. The efficacy of the interventions performed using the platform, when compared to traditional procedures, will be assessed, as well as the deployment strategy in a hospital and the benefits for health management in terms of budget and resources. In this way it will be possible to gather best practices guidelines and knowledge useful to perform policy recommendations for the national health systems of EU member countries.

- The FITREHAB project will integrate and field test a new and innovative virtual reality based rehabilitation and training platform. This will allow patients and medical discharged people to perform physical exercise at home under remote expert planning and monitoring.
- perform a field test of a rehabilitation and training platform
- to asses the clinical efficacy of a rehabilitation and training platform
- to deploy a procedure within the existing infrastructure of hospitals
- to asses the benefits of a rehabilitation and training platform for the national health systems in terms of costs and performance

| Activity |
| --- |
| The rehabilitation and training platform will consist of two integrated stations. One station will be used at hospitals by the medical staff to schedule a customized program of exercises. The other station will be used by the patient at home to do fitness with a virtual environment as a trainer. The movements of the patient will be tracked by several sensors attached to a smart shirt. An avatar will mimic the movements of the patient in the virtual environment. Biological sensors will monitor heart rate, temperature and breathing effort. This information will be sent back to the station in the hospital to be reviewed by the medical staff. If needed they can adapt the scheduled programme. |
| **Partner Organizations** |
| • University of Milan (Department of Computer Science – Laboratory of Applied Intelligent Systems AIS Lab) - Lombardy (IT) (Lead Partner)<br>• Private Foundation Barcelona Digital Technology Centre - Catalonia (E)<br>• Foundation of De Wever - Noord Brabant (NL)<br>• Private Foundation CETEMMSA - Catalonia (E)<br>• Viljandi Hospital Foundation - Estonia<br>• ASL of Brescia Province - Lombardy (IT)<br>• Upper Austria University of Applied Sciences Research (Ltd) - Upper Austria (A) |

| | |
|---|---|
| Sub Project Abbreviation Name | **FoBoS**<br>**Sharing Molecular Techniques For Food-Borne Pathogen Detection**<br>http://www.innovation4welfare.eu/297/subprojects/fobos.html |
| Length of Sub Project | 18 Months |
| Innovation Technology | Food and biotechnologies |
| Application of Technology | Services and products for target beneficiaries<br>Medical and home care systems<br>Safety and security |
| Targeted Beneficiaries | Ageing population, Chronic diseases, Infants |

**Objectives**

FoBoS, "Sharing molecular techniques for food-borne pathogen detection", directly aims to address one of Innovation4Welfare major objectives, that of improving the quality of life by developing and implementing a good practice useful for food-borne pathogen early detection. A safe food supply is a major public health and economic issue in Europe, both for foods consumed within the EU area and those produced there and exported. The consequences of food-borne diseases are evident. A number of affected people variable from one to one hundred and one to one thousand can develop very sever life-threatening diseases. Infants and elderly people, in particular the chronically ill patients, are at major risk for diseases caused by pathogen organisms present in food. Moreover, once affected, they are more likely to be hospitalized, with a ten times higher mortality rate. Many elderly people suffer by clinical complications, and it is believed that 2-3% of food borne diseases eventually lead to chronic conditions. A balanced team in which three University research group blend with five private company Partners with different, but complementary, missions (from agro-food industries to meal preparation and distribution public companies), will analyse, implement and transfer a DNA-array based protocol, that has been already proven successful in detection of mastitis bacteria in milk, to the field of food analysis.

In a first step the protocol will be customized to a) food-borne pathogen detection and b) several kind of food matrices, including milk, meat and cheese. In a second phase, the procedure will be implemented in an industrial context. The protocols that have been validated at the end of WP2 will be transferred to the agro-food and meal distribution companies, as well as other relevant and interested stakeholders for their implementation on Hazard Analysis and Critical Control Points (HACCP) and other food-chain critical points.

The expected result of FoBoS will be a new and innovative good practice, which will improve the effectiveness of regional food safety policies through the implementation of a DNA-array based procedure. Thanks to the application of this new and versatile technology, and the participation in the consortium of several typologies of private and public companies, FoBoS will also encourage new business opportunities focussed into innovative new products and services.

FoBoS, coordinated by the University of Milan and developed in the food thematic area, aims to address the improvement of the quality of life by developing and implementing a good practice for foodborne pathogen early detection.

To analyze, implement and transfer a DNA-array based protocol in order to improve the effectiveness of regional food safety policies.

**Activity**

In order to improve the quality of life, a good practice for food-borne pathogen early detection will be developed and implemented. Due to food-borne diseases people can develop lifethreatening diseases, especially infants and elderly people. Therefore a balanced team of three university research groups and five private companies will blend to analyze, implement and transfer a DNA-based protocol. At first the protocol will be customized to food-born detection and to several kinds of food matrices, including milk, cheese and meat. In the second phase, the procedure will be implemented in an industrial context. After validation of the protocol, it will be transferred to the agro-food and meal distribution companies, as well as to other relevant and interested stakeholders. They can implement it in their Hazard Analyses and Critical Control Points (HACCP) and other food-chain critical points.

| Partner Organizations |
| --- |
| • University of Milan (Department of Animal Pathology, Hygiene and Veterinary Public Health) - Lombardy (IT) (Lead Partner)<br>• Autonomous University of Barcelona (Department of Animal and Food science) - Catalonia (E)<br>• Estonian University of Life Sciences (Dept. Food sciences and hygiene, Institute of Veterinary medicine and Animal sciences) - Tartu (EST) |

| | |
|---|---|
| Sub Project Abbreviation Name | **ROBO M.D.**<br>**Home Care Robot for monitoring and detection of critical situations**<br>http://www.innovation4welfare.eu/307/subprojects/robo-m-d.html |
| Length of Sub Project | 18 Months |
| Innovation Technology | ICT |
| Application of Technology | a)Services and products for target beneficiaries<br>b)Accessibility, mobility and smart homes<br>c)Medical and home care systems |
| Targeted Beneficiaries | Ageing Population, Chronic diseases, Sick people (At home) |

**Objectives**

Home Care Systems especially and remote care systems currently facing significant chal-lenges, as the sector "health" is under pressure from rapidly changes at the demand side combined with political emphasis on the ageing population. This means, there are an in-creasing number of elderly people and people with cardiovascular diseases and which are in a sufficient good state of health not to need hospitalization. Nevertheless they might be subject to serious risks of sudden events or fast changes of state of health which require either a prompt medical attention or complete information for the attending medical personal. A Home Care Robot for monitoring and detection of critical situations (ROBO M.D.) has the major objective to increase the patient's services via wireless ICT technology to offer a ser-vice tool to our beneficiaries and furthermore help decrease the cost of regional home care systems. Fostering the diffusion of socio-economic welfare solutions for regional productive activities by creating a wireless home care system is a future social economic benefit for all involved actors and regions. For our beneficiaries the availability of a simple system, able to monitor their condition at home with no invasiveness would increase the quality of life while reducing the effort by the health care system. Availability of modern non-invasive, small size sensors able to acquire skin temperature, heart rate,

acceleration and other vital signs allows testing such new opportunities. On top of that, such a personal system can be ex-tended by using an available 4-wheel service robot to check the environment, equipped with special cameras and microphones. In the case of an alert (e.g. smoke detector), the robot gains a better understanding of the environmental situation and urgency, to finally reassure and communicate with the patient, the care provider and/or relatives. Preventing an excessive number of false alarms and additionally, all the hardware necessary for data acquisition, processing and visualization can be included on the robot. The project consortium will investigate in the interaction with its targeted beneficiaries to develop the best re-salts for all interested groups: the patient as well as public and private organisations and operators. Especially regional policies should be influenced, showing new ways of decentralised and mobile health care tools to force regional home care, mobility and smart home potentials by dissemination exchange. ROBO M.D. favours the exchange of experience, putting together groups with different expertise combining specialists in physiological modelling, medical and clinical expertise, human pattern recognition, statistical data analysis and pro-to type building. In addition, all partners strongly believe that this project will provide the regions with economic and social welfare solutions for a broad range of applications and therefore will foster sustainable cooperation with companies, operators and hospitals.

ROBO M.D. is a home care robot which monitors and detects critical situations which need prompt medical attention for eldery people or people with cardiovascular diseases.

- To increase patients' services via wireless ICT technology
- To offer a service tool to beneficiaries
- To help to decrease the cost of regional home care systems

**Activity**

The participants will investigate by interaction with its targeted benificiaries, the best results of remote care for patients and public and private organizations and operators. ROBO M.D. favours the exchange of experience, putting together groups with different expertise e.g. combining specialists in physiological modelling, medical and clinical expertise, human pattern recognition, statistical data analysis and prototype building.

| Partner Organizations |
| --- |
| • Johannes Kepler University (Institute for design and control of mechatronical systems) – Upper Austria (A) (Lead Partner)<br>• Institute of Electronic, Information and Communication Technologies (IEIIT) Milano Branch (MI) – Lombardy (IT)<br>• Fontys University of Applied Sciences – Noord Brabant (NL)<br>• University of South Bohemia CB (Pedagogical faculty, department of Physics) – South West Bohemia (CZ)<br>• University of Tartu (Bioinformatics, Algorithmics and Data Mining Group, department of Computer Sciences) - Tartu (EST) |

| | |
|---|---|
| Sub Project Abbreviation Name | **MNEMOSYNE**<br>**Teleassistance Services for Elderly Patients with Dementia Syndrome, Alzheimer and their Families**<br>http://www.innovation4welfare.eu/304/subprojects/mnemosyne.html |
| Length of Sub Project | 18 Months |
| Innovation Technology | ICT |
| Application of Technology | Medical and Home Care Systems |
| Targeted Beneficiaries | Ageing population, chronic diseases, sick people at home |

**Objectives**

The Mnemosyne project is conceived to design an online-based platform of health and social care services for individuals with dementia syndrome and Alzheimer and, more in particular, for their relatives.

This platform will provide innovative means of emotional and informational support for relatives and carers of Alzheimer and dementia patients, together with tools for the remote assistance and monitoring of the patients and educational appliances for cognitive stimulation. Moreover, through the implementation of a pilot test, the consortium will seek to establish the validity of teleassistance home care services for remote therapeutic treatment of dementia and Alzheimer.

The project's main objective is to design an efficient and innovative system that will increase the quality of life for families, carers and patients and that will complement the services provided by health institutions and professional careers.

The development of a field study on the use of new information and communication technologies in the treatment of dementia and Alzheimer will allow the partners to draw a picture of the state-of-the-art of the sector and will identify the most pressing needs to be addressed.

Based on these findings the consortium will adapt an already existing technical platform (provided by Stichting De Wever) in order to design an innovative multidisciplinary service of teleassistance that will include:

a Remote support and guidance services for patients' relatives and carers.

b Informational applications for families, groups of risk and individuals with early cases of dementia.

c A Communication point for and between the patients' relatives (families' forum) and between relatives and professional health services.

In order to assess the applicability of the platform, a pilot test will be developed (through a presential and online programme) in the region of Catalonia. The pilot test (to be coordinated by the Fundació Sociosanitaria of Manresa following the clinical method) will provide the consortium with the necessary data to analyse and evaluate the benefits and challenges posed by using an ICT-based teleassistance service for the support of Alzheimer and dementia patients' relatives (and for the envisaged treatment of chronic cognitive disorders).

Therefore, the Mnemosyne consortium will evaluate the viability of using online-based health and social systems of teleassistance and support for families and carers and will highlight the benefits of this multidisciplinary service in closely bounding families and health professionals in the treatment and monitoring of dementia, Alzheimer and other cognitive disorders.

The consortium strongly believes that the project will have a relevant impact on public policy through the transferability of the results to national/regional health system institutions. For this reason, the consortium will produce a comprehensive white paper on policy recommendations to be used as a guideline by health administrations.

The Mnemosyne project is conceived to design an online-based platform of health and social care services for individuals with dementia syndrome and Alzheimer, and their relatives.

- To design an efficient and innovative system that will increase the quality of life for families, carers and patients

- To design a system that will complement the services provided by health institutions and professional carers
- To produce a 'white paper'on policy recommendations to be used as a guideline by health administrations

**Activity**

The online-based platfprovide innovative means of emotional and informational support for relatives and carers of Alzheimer and dementia patients. It also provides tools for the remote assistance and monitoring of the patients and educational appliances for cognitive stimulation. By conducting a pilot test, the validity of teleassistance home care services for remote therapeutic treatment of dementia and Alzheimer will be researched. The outcomes will give partners the opportunity to draw a picture of the state-of-the-art of the sector and to identify the most pressing needs to be addressed.

**Partner Organizations**

- Social and Health Services Foundation of Manresa – Catalonia (E) (Lead Partner)
- Pro Mente Upper Austria – Upper Austria (A)
- Upper Austria University of Applied Sciences Research & Development– Upper Austria (A)
- Foundation of De Wever – Noord Brabant (NL)
- Tartu City Government Department of Social Welfare – Tartu (EST)
- Polytecnic of Milan - METID Centre – Lombardy (IT)

| | |
|---|---|
| Sub Project Abbreviation Name | **HaS Passport**<br>**Benchmarking of regional health and social institutions especially in rural areas**<br>http://www.innovation4welfare.eu/298/subprojects/has-passport.html |
| Length of Sub Project | 18 Months |
| Innovation Technology | ICT, Design |
| Application of Technology | Medical and Home Care Systems |
| Targeted Beneficiaries | Ageing population, Sick people (at hospital) |

**Objectives**

Project participants realized there is not exist any common benchmarking of provided services in health and social sphere in their regions which will reflect key important aspects of provided services and compare the quality and innovativeness of services with gained objective results and subjective response from side of end beneficiaries. Project participants also realised there is lack of experience in some areas in their regions (especially rural ones) how to innovate provided services or develop new innovative ones.

Based on that participants approved to research common benchmarking methodology bringing these all three aspects together to benchmark invited representative group of regional service providers which will result in creation of passport for each participating service providers which will result in creation of passport for each participating service provider. Passport will be provided just for benchmarked organization and will bring them better of understanding of relevance of their service, comparison with other similar providers, recommendation for future development and could be used in future capitalisation of project result by service provider by development of new services based on researched passport.

Gained information through benchmarking process will be analysed at general level and will be compiled in Benchmarking Study and Policy recommendation.

Benchmarking process is supported by relevant policy decision makers in each region and as the result will bring valuable information usable in regional policies or strategies for social and health service development as well as these ones supporting investment in innovation in health & social area.
To stimulate innovation in regional health and social services especially in rural areas where the environment is very specific, participants will select most relevant passports and compile from them after the providers´ approval the Good Practice book and organize Exchange of Experience seminar which will bring together service providers and other relevant expects to exchange information about their experiences.

HaS Passport aims to stimulate innovation in regional health and social services, especially in rural areas. A 'passport' will be created in order to organize exchange of experience and to create a good practice book.

- To provide better understanding of the relevance of health and social services in rural areas
- To compare the services of the providers involved with similar organizations (benchmark)
- To make recommendations for future development of new services based on research outcome
- To create a 'Good Practice Book' based on the passports of the service providers involved
- To disseminate the outcomes to service providers and other relevant experts by organizing an Exchange of Experience seminar

**Activity**

All information gained through the benchmark is to be analyzed at a general level. The outcomes will be compiled in a Benchmarking Study and Policy Recommendation. The benchmarking process is to be supported by relevant policy decision makers in each region. As a result it will bring valuable information usable in regional policies and strategies for social and health service development and supporting investments in innovations.

| Partner Organizations |
| --- |
| • University of Economics of Prague, Faculty of Management - South West Bohemia (CZ) (Lead Partner)<br>• Alintec - Lombardy (IT)<br>• Pro Mente Upper Austria - Upper Austria (A) |

| | |
|---|---|
| Sub Project Abbreviation Name | **TIAM Toolkits For Hazard Identification, Risk Assessment And Prevention Of Work-Related Musculoskeletal Disorders Based On A Collaborative Platform** http://www.innovation4welfare.eu/308/subprojects/tiam.html |
| Length of Sub Project | 18 Months |
| Innovation Technology | ICT and design |
| Application of Technology | Safety and security |
| Targeted Beneficiaries | Workers |

**Objectives**

In industrialized countries, work-related musculoskeletal disorders (WMSDs) and injuries are the most common occupational health problems. WMSDs now account for over 50% of all occupational diseases (with peaks of 85% and 80% in Spain and France, respectively). They reduce company profitability and add to governments´ social costs. Successful WMSD prevention can therefore greatly contribute to creating more and better quality jobs, as has been demonstrated in a number of successful cases in different work sectors (mainly in manufacturing). Moreover, EU-legislation has established new and highly innovative technical standards (EN 1005, ISO 11226/11228) in the area of "physical ergonomics, specifically aimed at protecting the "working population" from biomechanical and organizational risks for WMSDs.

However, it is not easy for users to find a suitable tool or strategy for identifying hazards and assessing risks for purposes of WMSDs prevention. Additionally, there are no criteria or guidelines for teaching users how to select the best method for a specific case. Hence, this project proposes to develop a set of toolkits to help users find the most suitable and effective solution to the problem at hand. The WMSDs prevention toolkits will contain not only tools/methods, but also guidelines, processes, checklists and templates for the purpose of hazard identification and risk assessment of WMSDs and injuries. After reviewing the existing tools/methods of hazard identification and risk assessment based on a collaborative platform, toolkits with guidelines, checklists

and templates will be created. When used with the toolkit guidelines, these templates will ensure that the procedure is complete and that key activities in the process are completed correctly. Additionally, good practices and successful experiences and innovations in WMSDs prevention will be collated and uploaded onto a website for sharing knowledge and promoting good practices in WMSDs prevention.

The project has been designed to: 1. Collate existing tools/methods, successful experiences, innovations, and good practices in ergonomic intervention; 2. Improve tools/methods, guidelines, checklists and templates for hazard identification and risk assessment by adapting and applying them to new applications; 3. Develop toolkits based on a collaborative platform for hazard identification and risk assessment for WMSDs and injury prevention; 4. Disseminate improved toolkits via a specified website in order to promote best practices in WMSDs and injuries prevention; and 5. Produce a report with recommendations for local/regional authorities on how to stimulate good practices in WMSDs prevention.

Developing toolkits based on a collaborative platform for preventing WMSDs will not only help companies improve and maintain healthy and safe working conditions, but will also promote the creation of new solutions in the field of WMSD and injuries prevention. As a result, it will significantly enhance worker health, life quality and productivity, as well as reduce sick leave absences and economic/social costs connected to work-related muscular disorders and injuries.

The TIAM project aims to develop a tookit to prevent work-related musculoskeletal disorders (WMSDs). The toolkit will contain guidelines, information on processes, checklists and templates for the purpose of hazard identification and risk assessment of WMSDs and injuries.

**Main objectives**

- To collate existing tools and methods, succesful experiences, innovations and good practices of ergonomic interventions
- To improve tools and methods, guidelines, checklists and templates for hazard identification and risk assessment by adapting and applying them to new applications
- To develop toolkits based on a collaborative platform for hazard identification and risk assessment for WMSDs and injury prevention

- To disseminate improved toolkits through a special website in order to promote best practices in WMSDs and injury prevention
- To produce a report with recommendations for local and regional authorities on how to stimulate good practices in WMSDs prevention

**Activity**

A WMDS toolkit will be developed with - besides tools and methods - guidelines, an overview of processes, checklists and templates for the purpose of hazard identification and risk assesment of WMSDs and injuries. Combined with the toolkit guidelines, the use of templates will ensure that a procedure is complete and that key activities in the process are completed correctly. Good practices and succesful experiences and innovations in WMSDs prevention will be collated and uploaded onto a website for sharing knowledge and promoting good practices in WMSDs prevention.

**Partner Organizations**

- Technical University of Catalonia (CERPIE) – Catalonia (ES) (Lead Partner)
- Foundation IRCCS "Major Hospital" Policlinico Mangiagalli Regina Elena – Lombardy (IT)
- University of West Bohemia (New technologies – Research Centre) – South West Bohemia (CZ)
- Technology Center PERG – Upper Austria (A)
- University of Tallinn (Department of Work Environment and Safety/ Institute of Business Administration, Faculty of Economics/Laboratory of Ergonomics) – Tallin (EST)

| | |
|---|---|
| Sub Project Abbreviation Name | **PICKFIBER**<br>**Platform for International Collaborative Knowledge on Food Improvement**<br>http://www.innovation4welfare.eu/306/subprojects/pickfiber.html |
| Length of Sub Project | 18 months |
| Innovation Technology | Food and Biotechnologies |
| Application of Technology | |
| Targeted Beneficiaries | Ageing population, Chronic diseases |

**Objectives**

PICKFIBER is an international platform of experts on the development, testing and data managing of novel food components based on ecological/organic fibers with specific properties to fight obesity and associated conditions.

To produce a reference scientific handbook for the scientific advisors of the European Safety Food Authority and innovative agro-food companies. Activity The expert platform will consist of protocols for the evaluation of ecological/organic sources for food components with high hydration, satiety and signalling properties. It also consists of a guideline of laboratory and clinical protocols for Good Laboratory Practice (GLP) and Good Clinical Practice (GCP) in health-related properties of foods containing fibers from ecological/biological products. The guideline will establish the appropriate in-vitro and in-vivo assays to scientifically validate the effects on health of possible bioactive component candidates. Within the GCP a pilot-testing environment with obese patients will be created to serve research institutes and companies in getting better claims for the products. Last but not least an e-knowledge base, stucturing and managing data from different sources with the purpose of supporting the analysis and quantification of the effects of health food(ingredients) on the subject state. The expert platform will also disseminate the outcomes and make them available to local food companies, food producers and laboratories.

The project results will be used as a building block for developing further the policies about linking the regional food and health priorities.

**Activities**

- Compose a compendium about health effects of organic and conventional food.
- Compose a compendium of production standards for fiberbased food from organic/ecological production.
- Elaborate a set of GLP recommendations for obtaining healthy food from organic/biological production, and GCP protocols for the analysis of their effects on human health.
- Develop an e-knowledge base from different sources - laboratory, medical and technical knowledge - ICT structure
- Systematic dissemination and promotion.

**Partner Organizations**

- University of Lleida (Nutren-Nutrigenomics) – Catalonia (ES) (Lead Partner)
- Estonian University of Life Sciences – Tartu (EST)
- Brabant Development Agency (BOM) – Noord Brabant (NL)
- Institute of Molecular Bioimaging and Physiology – CNR – Lombardy (IT)
- Institute for Construction Technologies – Lombardy (IT)
- Politecnico di Milano (department of bioengineering) – Lombardy (IT)
- La Selva County - Catalonia (ES)
- University of South Bohemia (Institute of Physical Biology) – South West Bohemia (CZ)

| | |
|---|---|
| Sub Project Abbreviation Name | **MRH**<br>**Mechatronics Based Rehabilitation at Home**<br>http://www.innovation4welfare.eu/305/subprojects/mrh.html |
| Length of Sub Project | 18 months |
| Innovation Technology | ICT and Design |
| Application of Technology | |
| Targeted Beneficiaries | Ageing population, Chronic diseases |

**Objectives**

- Investigate the increase of overall quality, efficiency and effectiveness of physiotherapy by
  - Introducing Mechatronics based rehabilitation equipment,
  - Designed for use by patients at home under remote supervision by therapists and medical specialists, Project X 1.0 Pagina 3 31 March 2009
  - Reducing the number of repetitive visits to or from therapists,
  - Giving rise to new business opportunities for SME's. MRH Activities

To compose a 'white book' on all aspects of the MRH concept

- from the obtained results of the project,
- for regional policymakers, companies, healthcare providers

**Activities**

The MRH project will focus on five main issues:

1 The present developments in rehabilitation
2 The success factors of a MRH application
3 The business opportunities for a MRH application
4 The design and development of MRH applications
5 The steps to be taken to make MRH applications a success

| Partner Organizations |
| --- |
| • Fontys University of Applied Sciences (School of Engineering, Mechatronics Department) - Noord Brabant (NL) (Lead Partner)<br>• Technical University of Catalonia (CDEI) – Catalonia (ES)<br>• University of Brescia (Laboratory of Mechatronics , Faculty of Engineering) – Lombardy (IT)<br>• University of West Bohemia (Faculty of applied sciences, Department of Cybernetics, Automatic Control section) - South West Bohemia (CZ)<br>• Upper Austria University of Applied Sciences Research & Development – Upper Austria (A) |

# VI THE I4W POLICY DEVELOPMENT FRAMEWORK

## *Introduction to the I4W Policy Development Framework*

It is in recognition of this diversity and complexity, that has been described in previous chapters, that I4W project has deliberately chosen not to pursue 'one size fits all" approach, and has instead used a methodology that has embraced diverse and customized solutions to problems that affect the health and safety of citizens. This is partially the reason that emphasis has been placed on the identification of the specific circumstances of each region, including the demographic, social, political and policy frameworks that currently exist.

However, this project was also designed with the belief that, despite these acknowledged differences between regions, there are some overarching issues that face all (or most) of European regions. Furthermore, there are also initiatives that have been shown to be successful, producing tangible and measurable results in relation to a specific objective. It is therefore believed that the I4W approach will have a real impact on policy development in the partner regions and beyond and the results of the subprojects in particular and I4W project in general will serve as effective model for interregional cooperation in Europe.

The matrix below describes the major policy priorities within each partner region related to innovation, healthcare and welfare. The priorities of each region were established by reviewing the regional profiles described in section 3 of this document and the good practices identified within each region which are described in section 4. The matrix also indicates which of the 8 sub-projects corresponds to each of the priorities.

The list of priorities shows a wide variety of approaches that are being taken be each of the partner regions, which is a result of the diverse operating and socio-political-economic environments in which they were developed. They also illustrate the different ways in which innovation can be pursued in general. Despite this diversity, the policy priorities can be grouped into three general categories:

1 A desire to implement approaches that have been proven to aide in innovation, such as the promotion of multi-region networks, or increasing funding for universities and other research organizations.
2 Responses to common social trends, such as the impacts that aging, chronic illness and the costs of health care will have on the stability of the region.
3 Efforts to promote strategic initiatives in technological sectors such as ICT and biotechnology that are believed to have multiple benefits in the region.

Some policy approaches are very broad whereas others have more focused goals. This could be the result of many factors, such as the level of previous policy-level analysis has been conducted or the size and complexity of the region. The differences between the Catalonian and Estonian policy goals exemplify this. Despite the fact that Catalonia's population is more than six times larger than Estonia's, it is representing a sub national region that must on some level develop policy approaches in line with the Spanish national government, whereas Estonia does not face this requirement. As a result, Estonia has identified specific sectors that it intends to focus resources on, whereas Catalonia has chosen to set broader priorities that would appeal to a larger number of people and open the possibilities for innovative activity from wider set of participants.

## *I4W Regional Priorities*

The priorities within each region can be summarized as the following:

**Catalonia's** priorities can best be described as a desire to promote innovative international research in Universities and research centres in the region that is focused on the use of ICT in health care to address the needs of chronically ill and hospital patients. These priorities are all being addressed by I4W subprojects.

**Lombardy's** focus is on the promotion of biotechnology including food, agriculture production and its environmental impact. Other areas of focus has been on the development of services and products for the elderly and people with chronic diseases – all are areas addressed by subprojects. Another materials for the building trade and aeronautics.

**Nord Brabant's** priorities addressed by I4W subprojects centre around the use of innovation to help with important populations, including the elderly, the disabled and chronically ill people in and out of hospitals. Areas of application to be focused upon include medical services and products, home health care and design. These innovations should have a commercial component applicable with SMEs and should be part of international clusters. Other priorities not directly addressed by I4W include sustainable energy and pharmaceuticals.

**South West Bohemia's** priorities are focused on designing services and products, including those that enhance the home accessibility and mobility for handicapped individuals, as well as for the aging and people with chronic diseases. A strong emphasis is placed upon the strengthening of participation of SMEs in these processes and on the use of networks and interregional cooperation to pursue innovation in these areas.

**Upper Austria's** priorities address rising healthcare costs by focusing on the needs of the aging and those with chronic disease via the development of services and products. This includes the improvement of medical and home care systems. Specific technological/research areas include mechatronics, information and communications

technology and design. Networking with other EU regions is considered an important element in meeting these priorities.

**Estonia's** priorities centre around key sectors that it would like to promote, including ICT and biotechnology related to food and agriculture. The innovations in these sectors can amongst other things be used to benefit the aging and the sick through the development of medical and home care systems and other services and products that can benefit the aging and/or chronically ill living at home. To do so, emphasis is placed upon the development of human capital and improving connections between Estonia and other countries.

**The following matrix helps to summarise in a nutshell the linkages between the regional policy priorities and the selected subprojects.**

| Region | Priorities | FoBoS | PICK-FIBER | TIAM | HaS Pass-port | FIT-REHAB | MRH | MNEMOSYNE | ROBO MD |
|---|---|---|---|---|---|---|---|---|---|
| **Catalonia,** Spain | Cutting Edge Research: Partners include universities, hospitals and/or research centres | | | | | | | | |
| | Internationalization: More than 3 countries | | | | | | | | |
| | Use of ICT to improve health care | | | | | | | | |
| | Focus on Chronically ill and hospital patients | | | | | | | | |
| **Lombardy,** Italy | Develop biotechnology and food science to improve health | | | | | | | | |
| | Services and products for the elderly and chronically ill | | | | | | | | |
| | Improve mobility for elderly | | | | | | | | |
| | Materials for building trade and energy saving | | | | | | | | |
| | Improve agricultural production | | | | | | | | |
| | Promote Aeronautics and mechanics | | | | | | | | |
| **Noord-Brabant,** Netherlands | Services and products for the elderly and chronically ill | | | | | | | | |
| | Home health care and design for elderly and ill | | | | | | | | |
| | Create concrete innovative concepts to be applied by SMEs | | | | | | | | |
| | Build sustainable international clusters (over 3 regions) | | | | | | | | |
| | Enhance pharmaceuticals | | | | | | | | |
| | Develop new sustainable sources of energy | | | | | | | | |
| **South West Bo-** | Services/products for handicapped, aging and chronically ill | | | | | | | | |

| Region | Priorities | FoBoS | PICK-FIBER | TIAM | HaS Pass-port | FIT-REHAB | MRH | MNEMOSYNE | ROBO MD |
|---|---|---|---|---|---|---|---|---|---|
| **hemia**, Czech Rep | Home accessibility/mobility (handicapped,aging,chronic ill) | | | | | | | | |
| | Strengthen of participation of SMEs in innovation | | | | | | | | |
| | Increase interregional cooperation (at least 4 regions) | | | | | | | | |
| **Upper Austria** | Concentrate on mechatronics | | | | | | | | |
| | Concentrate on ICT | | | | | | | | |
| | Concentrate on life sciences | | | | | | | | |
| | Concentrate on innovative materials | | | | | | | | |
| | Use technology to address the increase of diseases | | | | | | | | |
| | Promote EU networking (4 or more regions) | | | | | | | | |
| | Services/products to improve medical/home care for aged | | | | | | | | |
| | Address the rising costs of the health system | | | | | | | | |
| **Estonia** | Focus on Key Sector of ICT | | | | | | | | |
| | Focus on Key Sector of Material Science | | | | | | | | |
| | Focus on Biotechnology, food and agriculture | | | | | | | | |
| | Services and products for aging and the sick living at home | | | | | | | | |
| | Medical/home care systems for the aging and sick at home | | | | | | | | |
| | Improve connections of countries-at least 3 partner re-gions | | | | | | | | |

## *Good Practices*

The charts below summarize the totals of good practices that were classified in terms of the innovation technology they use, the application of the technology, the target beneficiaries and the sources of funding.

| | **ICT** | **Advanced Materials** | **Food Tech & Bio** | **Design** |
|---|---|---|---|---|
| Services & products for target groups | 6 | 1 | 3 | 6 |
| Accessibility, mobility & Smart Homes | 3 | 0 | 0 | 4 |
| Medical & Home Care Systems | 7 | 0 | 1 | 1 |
| Safety & Security | 1 | 0 | 0 | 0 |

| | | | | | |
|---|---|---|---|---|---|
| **Target Beneficiaries** | Ageing Population | 6 | | Start-up | Upkeep |
| | Chronic Disease | 5 | Public | 10 | 7 |
| | Workers | 6 | PPP | 3 | 1 |
| | Infants | 5 | Private | 3 | 5 |
| | Disabled | 6 | | | |
| | Hospital Patients | 6 | | | |
| | Home Patients | 4 | | | |

## *I4W EU/Regional Policy, Subprojects and Innovation Focus Areas*

During the Innovation for Welfare conference held in Estonia in June of 2010, representatives from each of the I4W partners and funded subprojects met to discuss EU/Regional policy and subprojects in relation to the four Innovation Focus Areas described in section 2 of this report.

<table>
<tr><td>Subproject<br>FOBOS</td><td>Innovation Focus Area: FOOD SCIENCE</td><td>Subproject<br>PICKFIBER</td></tr>
<tr><td>Regions Participating<br>• Catalonia<br>• Estonia<br>• Lombardy</td><td>Of the four identified focus areas, food is perhaps the most closely linked and dependent upon European policy. As a result of this close connection, a primary conclusion was that efforts to promote innovation in food policy, especially in terms of food safety, will continue to be limited due to a lack of evidence-based food policies. In particular, there is a need for a more comprehensive assessment of food and its effect on health. Currently, too many policy decisions relating to food and food safety are based upon political, economic or even arbitrary reasons. One reason for this is that there are not enough evidence-based techniques available at the moment. To reverse this trend, techniques must be developed and implemented – and perhaps most importantly – science-based food policies must be adopted even when their decisions go against economic interests. One way to improve techniques would be to increase and standardize research and control at the molecular level. Also, traceability of food products should be enhanced such as via a “Made in the EU” labelling system that indicates from what regions various food products are coming.</td><td>Regions Participating<br>• Catalonia<br>• Estonia<br>• Lombardy<br>• Noord Brabant<br>• South West Bohemia</td></tr>
</table>

<table>
<tr><td>Subproject<br>HSP</td><td>Innovation Focus Area:<br>WORK/SAFETY/BENCHMARKING</td><td>Subproject<br>TIAM</td></tr>
<tr><td>Regions Participating<br>• Lombardy<br>• South West Bohemia<br>• Upper Austria</td><td colspan="2">HSP and TIAM identified six ways in which they will help support and strengthen EU policies and benefit stakeholders:<br>1 A contribution to 2 European Directives addressing the problem of work related muscular-skeletal disorders<br>2 A general contribution to EU benchmarking activities related to health and social services<br>3 A contribution to the establishment of European standards<br>4 An exchange of experiences and synergies with the European Agency for Safety and Health at Work<br>5 Guidelines for work safety will be created and disseminated<br>6 Education and awareness raising will be undertaken to build on project outputs to promote prevention and improve work safety<br>HSP and TIAM’s ability to reach these 6 goals will be enhanced by synergies and cross-fertilization of the two sub-projects to ensure that they<br>• Contribute to EU standards,<br>• Are able to improve prevention and risk assessment,<br>• Can increase the knowledge of end users<br>• Contribute to the decreased cost of services</td><td>Regions Participating<br>• Catalonia<br>• Estonia<br>• Lombardy<br>• South West Bohemia<br>• Upper Austria</td></tr>
</table>

<table>
<tr><td>Subproject<br>ROBO MD</td><td colspan="2">Innovation Focus Area: TELESERVICES</td><td>Subproject<br>MNEMOSYNE</td></tr>
<tr><td>Regions Participating<br>• Estonia<br>• Lombardy<br>• Noord Brabant<br>• SW Bohemia<br>• Upper Austria</td><td colspan="2">Teleservices role in welfare promotion is most clearly demonstrated in e-Health initiatives. However, amongst the participating regions in the I4W project, especially Estonia, Catalonia and Upper Austria - e-Health is not a leading market activity. The high initial investment required and uncertainty of revenue streams means that e-Health must be pushed in each of these regions.<br><br>This is especially relevant in I4W because for both subprojects, SME involvement in the development and implementation of teleservices is vital to success. In addition to SME participation, the adoption of technical equipment with the highest personal utility of patients possible is another important success factor. This is even more important than the technology itself. The best equipment in the world is worthless if the intended consumers are unable to use it. This is especially relevant for several target groups of e-health teleservices such as the sick, disabled and/or elderly – whose prior experience with and understanding of technology often times is lacking. Thus, along with increased usability, training programmes for target user groups are important to success.</td><td>Regions Participating<br>• Catalonia<br>• Estonia<br>• Lombardy<br>• Noord Brabant<br>• Upper Austria</td></tr>
</table>

| Subproject **MRH** | Innovation Focus Area: **REHABILITATION** | Subproject **FITREHAB** |
|---|---|---|
| *Regions Participating*<br>• Catalonia<br>• Lombardy<br>• Noord<br>• Brabant<br>• South West<br>• Bohemia<br>• Upper<br>• Austria | Introducing new medical technologies often takes a long time between initial ideas and market release of products due in part to delays by governments and insurance companies in approving products. Delays cost money, which is why projects like I4W are needed to help companies bridge the gap between product development and market uptake. Without this support, introducing new medical technologies are usually only affordable for large companies that are able to invest capital for longer periods of time. Also, for SMEs in particular, communication and collaboration across borders can be vitally important. Shared knowledge between European regions can lead to reductions in development and approval time, helping SMEs remain competitive.<br><br>The need for collaboration to foster innovation is a common theme throughout all aspects of the I4W framework, from EU and Regional policy priorities to identified best practices and selected sub projects. This is especially true for the Rehabilitation area, because there is a need to enhance collaboration not only between SMEs or regions but between the medical and technological 'worlds.' Within these two 'worlds' there are very different approaches taken towards innovation processes which do not always work well. One potential solution to this would be to modify university curricula to join together fields of study that traditionally are kept separate, such as for example medicine and engineering. In keeping with the identified need for increased cooperation, both MRH and FITREHAB have made an agreement to keep in contact and collaborate if possible, due to the familiarities of their work. | *Regions Participating*<br>• Catalonia<br>• Estonia<br>• Lombardy<br>• Noord<br>• Brabant<br>• Upper<br>• Austria |

## *Knowledge Sharing and Dissemination Activites*

An important element of the I4W project is the sharing of knowledge, amongst I4W partners, subproject participants and those outside of the project. The value of this dissemination will be enhanced by evaluation activities that will be undertaken to assess critical indicators for project and subproject success. A short list of I4W indicators includes the following:

- Within partner and subproject participant organisations, at least 36 staff members will obtain new skills from direct involvement extensive exchange of experience.
- Through indirect involvement, documentation produced and dissemination activities, the 'spin-off' will be far higher, estimated at more than 60 policy-makers and experts having increased knowledge in the regions involved, and many more from other regions that are not involved as partner in I4W.
- The subprojects will yield improvements in at least 8 existing methodologies and strategies for welfare-related innovation policy. Through support by project partners and the Advisory Group this will lead to at least 6 good practice policies being transferred between regions in the project. Through intensive dissemination campaign, including 3 high-profile events a large variety of dissemination material.
- On the basis of the results and external evaluation of each subproject, the partners will define a good practice guide and a set of overall policy recommendations that will be intensively disseminated to regional decision-makers across Europe.