

# Ambient Assisted Living for ageing well – an overview

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Ambient Assisted Living (AAL) can be considered as a future umbrella for technological advances. Especially elderly-related activities will be facing severe economical, social and psychological challenges such that all categories of the society (scientists, industrials, stakeholders and politicians) are called to contribute solutions to deal with expected issues. This paper aims to inform the intended readership about the status of research, programmes as well as actual efforts and challenges in the field of AAL. This report provides first the status of the problem as well as an overview of the AAL topics targeted by the European AAL Association and the European Commission. Selected AAL projects in Europe and worldwide as well as existing umbrellas for funding AAL research and technologies are briefly introduced.

Keywords: Ambient Assisted Living; survey; issues; prevention; technologies

## **Ambient Assisted Living – ein Überblick.**

*Ambient Assisted Living (AAL) kann als eine der Triebfedern zukünftiger technologischer Entwicklungen gesehen werden. Die Überalterung der Gesellschaft stellt uns vor gewaltige ökonomische, soziale und psychologische Herausforderungen, so dass alle Elemente der Gesellschaft (Forschung, Industrie, Bedarfsträger, Politik) gefordert sind, an der Lösung dieser Probleme mitzuarbeiten. Dieser Artikel soll über den aktuellen Status der Forschung, Programme sowie über aktuelle Bemühungen und Herausforderungen auf dem Gebiet des AAL informieren. Beginnend mit einem Überblick über AAL-Themen, wie sie von der europäischen AAL-Vereinigung und der Europäischen Kommission definiert wurden, werden danach ausgewählte Projekte und Förderprogramme präsentiert.*

*Schlüsselwörter: Betreutes Wohnen; Überblick; Vorsorge; Technologien*

Received April 30, 2010, accepted July 27, 2010  
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## **1. Introduction and motivation**

Europe is ageing. The percentage of the population that is 65 years old or older as well as the life expectancy are rising (see Fig. 1). The number of elderly people will be more than doubled by 2050 and the proportion of people living alone will increase (source OECD). Furthermore, the percentage of people over 80 will increase from 3.5% in 2000, to 10.9% in 2050 (see Fig. 2).

A European joint programme has been set up based on Article 169 (European Union, 2008) of the EU treaty to promote research and innovation in Ambient Assisted Living (AAL) enhancing the quality of lives of elderly people by the use of new ICT products and the provision of remote services. Especially, safety and security of elderly citizens at home have a clear European dimension of high relevance (Recommendation 1796 (2007) of the Parliamentary Assembly of the EU Council). Figure 1 depicts a comparison of life expectancy in 2004 and 2050 in the EU25 countries. This analysis is reported from EUROSTAT, 2004 and shows the increase of the average elderly age by about 15% in the next 50 years.

Figure 2 depicts the development statistics of the Austrian elderly fraction aged 80 and above between the period of 1869 and 2050. According to these statistics, more than 10% of the Austrian society will be above 80 years old by 2050. The expected number of persons needing care in Austria will be 90% higher than the one in 2001 as shown in Fig. 3. There is a raising concern in Austria and Europe about this increase, which is reflected in several programmes investigating measures to cope with the impact of these issues. This paper provides a survey of the AAL activities in Europe by showing the European efforts in providing solutions (technological and social)

at different levels like the EC programme, industry and research. The paper is structured as follows: In Sect. 2 an overview of AAL landscape in Europe is given including main objectives, funding programmes and selected projects in Europe, Japan and USA. Section 3 briefly describes the economical and social aspects of AAL activities. Future AAL solutions and targets are presented in Sect. 5. Section 6 provides a summary of the paper and highlights the key information.

## **2. Ambient Assisted Living landscape**

### **2.1 Ambient Assisted Living overview**

Although Ambient Assisted Living is quite a new term, many topics, which are now organized under the AAL umbrella, have already been investigated for a much longer time. A new aspect is that AAL focus has been mainly shifted to elderly people rather than generic technologies. Nevertheless, the topics covered by the term AAL are quite broad and diverse. On 19 September 2007, the European AAL Association was founded by 14 members from different European countries based on the so-called “Article 169 Initiative” of the European Commission (EC) Treaty. Activities of this association deal with coordinating and implementing the AAL joint programme between the EC and national funding organizations involving 20

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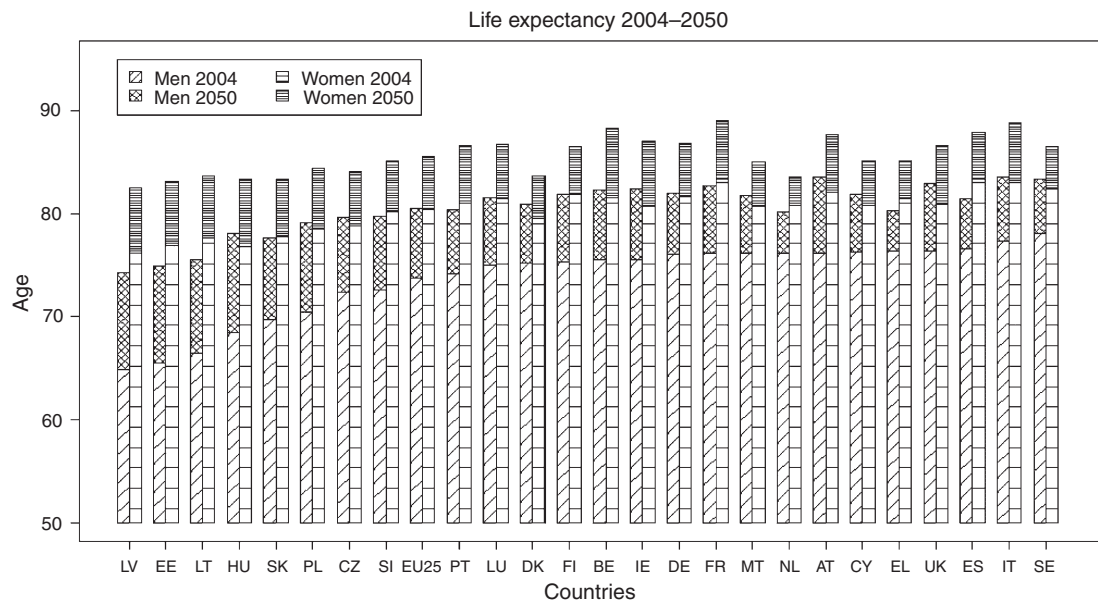


Fig. 1. Life expectancy 2004–2005 for the EU25 countries (Source: EUROSTAT, 2004)

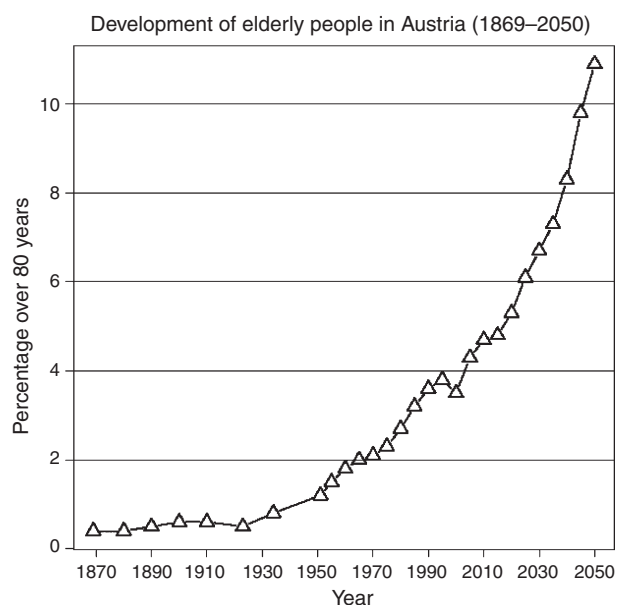


Fig. 2. Development of elderly persons (above the age of 80) in Austria 1869–2050 (Source: Statistics Austria)

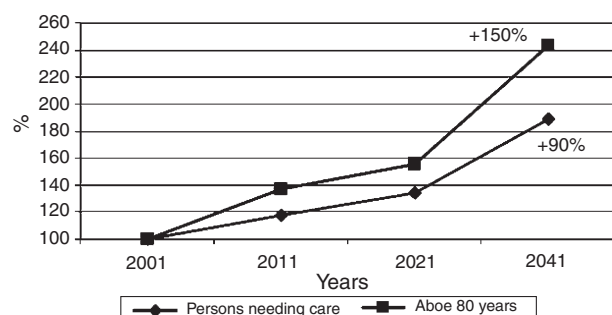


Fig. 3. Development of elderly and persons needing care in Austria (2001–2041) (Source: Statistics Austria)

European member states and 3 associated states towards the enhancement of elderly life quality through information and communication technologies. The scheme in Fig. 4 is taken from the presentation (Finking, 2007) of Dr. Gerhard Finking (Federal Ministry of Education and Research in Germany), the former president of the European AAL Association. It shows the objectives of the European AAL Association in the frame of the AAL joint programme “ageing well”. The following objectives highlighted are taken from his presentation.

(1) “The overall objective of the AAL joint programme is to enhance the quality of life of older people and strengthen the industrial base in Europe through the use of Information and Communication Technologies (ICT).” The impact of this objective will be reflected in the following aspects:

- ▶ Enhanced life quality of elderly persons
- ▶ Fostering the European economy
- ▶ Application of ICT systems for AAL

(2) “Foster the emergence of innovative ICT-based products, services and systems for ageing well at home, in the community, and at work, thus increasing the quality of life, autonomy, participation in social life, skills and employability of elderly people, and reducing the costs of health and social care.” The impact of this objective will be reflected in the following aspects:

- ▶ Products, services and systems at home, in the society and at work
- ▶ Outstanding R&D at European dimension
- ▶ Agile SME participation
- ▶ Fostering the economical exploitation

The AAL-related topics are depicted in Fig. 4 and organized in two clusters of activities. Topics related to interaction are shown on the left side. Topics concerned with the individual person are located on the right side of the graphics. According to the European Commission, the current challenges in AAL that were published as project calls 1 and 2 under the AAL joint programme, are related to four clusters of activities:

#### ▶ Home care

Home care includes tele-health and tele-care solutions for elderly people ranging from prevention and early detection of chronic