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POLICY RESEARCH INSTITUTES

# **ALTERNATIVE SCENARIOS FOR HEALTH, LIFE EXPECTANCY AND SOCIAL EXPENDITURE**

**ERIKA SCHULZ**

**ENEPRI RESEARCH REPORT NO. 4  
FEBRUARY 2005**



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## **Abstract**

This study deals with the impact of ageing populations and changes in their health status on health care and the utilisation of long-term care services. Two kinds of projection methods have been used to estimate increases up to 2050 in the number of hospital cases and days, contacts with doctors, long-term care recipients and severely hampered persons for Belgium, Denmark, Finland, France, Germany, the Netherlands, Spain and the UK. In the first projection method, health care utilisation data from national sources (which cover the whole population) are combined with two demographic scenarios. This kind of projection shows the impact of demographic change and increasing life expectancy on the utilisation of health care services. In the second projection method, data from the European Community Household Panel are used (which only includes persons aged 16+ but allows differentiation of utilisation data by health status) and combined with four demographic and health scenarios.

The two projection methods generally point to the same findings:

- changes in the number of hospital days and in the demand for long-term care-giving (i.e. the number of severely hampered persons) are likely to be stronger than changes in the number of hospital admissions and contacts with doctors;
- an additional increase in life expectancy leads to higher population figures by 2050, but increases in the utilisation of health care services are more dynamic; and
- for the most part, countries with decreasing populations by 2050 do not show lower increases in the utilisation of health care services than countries with increasing populations.

Improvements in health status lead to a more moderate increase in the utilisation of health care services compared with the scenarios that show no improvements in health. But in general, given the underlying assumptions improvements in health cannot completely compensate for the effect of increasing life expectancy.

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## Introduction

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**A** GIR's fourth work package (WP4) focuses on the implications of ageing populations for health care utilisation, health care expenditure, pension expenditure and the sustainability of public finance and pension regimes. It pays particular attention to the role of new insights concerning the relation between 'living-longer and in better health' and health care consumption, health care expenditure and pension expenditure. So it may shed new light on the impact of the ageing process upon the future development of health care and long-term care utilisation and important macroeconomic variables.

Generally it is expected that the ageing process will have an important effect on the sustainability of public finances, especially the pension systems and the health care systems. In the background is the fact that in all EU countries health care expenditure increases with age (EU-EPC, 2001) and that the share of the elderly will increase in the future too. But the population development is not directly related to health care expenditures. Besides demography, other important factors influence health care expenditures, especially medical and technological progress, political decisions and economic framework conditions. A study for Germany showed that health care expenditures were mostly influenced by technological progress and not by the ageing process (Breyer, 1999). The same results were observed for health care expenditures in the US (Okunade & Murthy, 2002).

The level of health care expenditures is usually the result of demand and supply factors, political decisions (including those by health-care insurance schemes as well) and overall economic conditions. Ageing could be an important factor on the demand side. A relevant intermediate step is the current health status. Health status deteriorates with age, and health status is the main factor in the demand for health care services. In the case of long-term care, functional disability and mental illness (especially among the oldest old) play an important role. The relation between age, disability and the need for long-term care is stronger than in the case of acute health care. Therefore, alongside the ageing process the development of health status and disability influences the further demand for health care and long-term care services. Consequently, AGIR deals with both the ageing process and health status.

WP4 focuses on the impact of increasing life expectancy on health care *utilisation* as well as on health care *expenditures*, pension benefits and public finances. Thus the tasks of WP4 are separated into two parts: Part A shows the impact of the demographic development and changes in the health status of the population on hospital cases, total hospital days and outpatient utilisation as well as on the number of long-term care recipients. This part of the research has been carried out by DIW (Berlin). Part B shows the impact of ageing populations on public finances, especially on health care expenditures and pension expenditures, and has been carried out by CPB (The Hague).

WP4 builds a bridge between WPs 1, 2 and 3 on one hand and work WPs 5 and 6 on the other hand. The first three work packages have collected data on several important aspects for the participating countries (Belgium, Denmark, Finland, France, Germany, the Netherlands, Spain and the UK) on a similar basis. Whereas WPs 1, 2 and 3 have focused on developments in the past, WP4 looks at future developments and uses the

collected data and information to make projections to 2050. The sensitivity of demographic projections for health care utilisation, expenditures and retirement benefits are demonstrated using a scenario approach with alternative assumptions about improvements in life expectancy and health. WPs 5 and 6 draw upon these scenarios to enable a discussion of policies that may cope with the population ageing problem.

Part A of WP4 presents projections of hospital cases, hospital days, contacts with doctors and long-term care recipients for eight EU countries (depending on the available data) with reference to the results of WP1 and WP2. The countries are: Belgium, Denmark, Finland, France, Germany, the Netherlands, Spain and the UK. Part A gives an idea of the further utilisation of inpatient and outpatient care as well as long-term care. This information can be useful for government officials, hospital administrators, practising physicians and providers of long-term care – mostly communities – to address the changes brought about by population ageing. In detail, the research has required the following tasks:

- provide population scenarios with alternative assumptions about further improvements in life expectancy;
- build scenarios about the further development of health status;
- formulate projections about acute and long-term care utilisation; and
- assess the impact of population development and female labour-force participation on the potential supply of informal care-givers.

To present the results of these tasks this report is divided into four chapters. In chapter 1, demographic and health scenarios are shown. The Eurostat baseline scenario is used as a base case and an additional demographic scenario is created with higher improvements in life expectancy to show the impact of living longer (living-longer scenario). A combination of these two demographic scenarios with an improving health scenario lead to the baseline better-health and living longer in better health scenarios.

In WP2 data were collected on two levels: first, country-specific data from national sources was collected that covered the total population and also gave information about long-term care-giving in institutions and as well as by professional care-givers at home, but did not allow differentiation by the health status of the population. Second, data was collected from the European Community Household Panel (ECHP), which covers only persons in private households aged 16+, but allows differentiation by health status. Therefore, the following projections are also made on two levels. In chapter 2 the impact of demographic developments on acute health and long-term care using country-specific data is projected. In this section the impact of the two demographic scenarios, mainly the impact of improving life expectancy, is shown on a national level for most of the eight participating countries. In chapter 3 the four demographic and health scenarios are used to show the effect of demographic developments and further improvements in the health status of the population on acute health care and on the need for long-term care based on data from the ECHP. These projections can be carried out for the EU (15) and the participating countries. Chapter 2 and chapter 3 are based on different data sets and are therefore not fully compatible, but each of these approaches has its advantage and it is worthwhile to show the results. Chapter 4 deals with the impact of an ageing population on informal care-giving at home.

## Chapter 1. Demographic and Health Scenarios

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### 1.1 Demographic scenarios

#### 1.1.1 Assumptions

The ageing process is determined by an increasing life expectancy and by fertility rates that are too low to ensure a natural replacement of the population. In the EU (15), the total fertility rate was on average 1.5 in 2002 (Table 1.1). In all participating countries the fertility rate has decreased in the past 40 years. In 2002 the highest fertility rate was realised in France with 1.9 and was the lowest in Spain with 1.25.

*Table 1.1 Fertility rate in selected EU countries*

Countries	1960	1970	1980	1990	2000	2002
Belgium	2,56	2,25	1,68	1,62	1,66	1,62
Denmark	2,57	1,95	1,55	1,67	1,77	1,72
Finland	2,72	1,82	1,63	1,78	1,73	1,72
France	2,73	2,47	1,95	1,78	1,88	1,89
Germany	2,37	2,03	1,56	1,45	1,38	1,31
Netherlands	3,12	2,57	1,60	1,62	1,72	1,73
Spain	2,86	2,90	2,20	1,36	1,24	1,25
United Kingdom	2,72	2,43	1,90	1,83	1,64	1,64
EU (15)	2,59	2,38	1,82	1,57	1,50	1,50

Source: Eurostat, Population Statistics 2004.

The decreasing fertility rates were accompanied by increasing life expectancies. The life expectancy at birth within the EU (15) member states has increased in the last 40 years (between 1960 and 2002) by 8.4 years for men and 8.7 years for women; for the elderly (aged 60 years) the increase was 4.2 years (men) and 5.2 years (women) (Table 1.2). In the EU (15) the life expectancy at birth for men was 75.8 and 81.6 years for women in 2002. The greatest gains in life expectancy at birth between 1960 and 2002 were seen in France, with 9.3 years for women and 8.7 years for men; the lowest appeared in Denmark with 5.1 years for women and 4.4 years for men (but Denmark had a high life expectancy in 1960). In 2002 the life expectancy for men aged 60 was 20.1 years (19.7 years in 2000) and for women aged 60 it was 24.2 years (24.1 years in 2000) in the EU (15). Among the participating countries Spain and France had the highest life expectancy for both genders in 2000. Belgium, Denmark, Germany, the Netherlands, Finland and the UK could not achieve the EU (15) average in 2000.

Whereas in the first decades of the 19<sup>th</sup> century improvements in life expectancy could be mostly linked to the reduction of mortality rates at birth and in the first years of life, in recent decades the greatest reduction in mortality rates can be observed in the middle and higher ages. As a result more and more people are alive at older ages: the number of

centenarians shows a high increase. This development could heighten the pressure on the health care system if improvements in health do not counter this effect.

*Table 1.2 Life expectancy in selected EU countries*

Countries	1960		1970		1980		1990		2000		2002	
	male	female	male	female	male	female	male	female	male	female	male	female
	at birth											
Belgium	67,7	73,5	67,8	74,2	70,0	76,8	72,7	79,4	74,6	80,8	75,1	81,1
Denmark	70,4	74,4	70,7	75,9	71,2	77,3	72,0	77,7	74,5	79,3	74,8	79,5
Finland	65,5	72,5	66,5	75,0	69,2	77,6	70,9	78,9	74,2	81,0	74,9	81,5
France	66,9	73,6	68,4	75,9	70,2	78,4	72,8	80,9	75,3	82,7	75,6	82,9
Germany <sup>1)2)</sup>	66,8	72,2	67,3	73,6	69,6	76,1	72,0	78,4	75,0	81,0	75,4	81,2
Netherlands	71,5	75,3	70,7	76,5	72,7	79,3	77,3,8	80,9	75,5	80,5	76,0	80,7
Spain	67,4	72,2	74,8	7,0	72,5	78,6	73,3	80,3	75,7	82,5	75,7	83,1
United Kingdom	67,9	73,7	68,7	75,0	70,2	76,2	72,9	78,5	75,5	80,2	-	-
EU (15)	67,4	72,9	68,4	74,7	70,5	77,2	72,8	79,4	75,5	81,4	75,8	81,6
	at 60											
Belgium	15,5	18,7	15,2	19,2	16,3	20,9	17,9	22,7	19,3	23,8	19,6	23,9
Denmark	17,1	19,3	17,1	20,6	17,0	21,4	17,4	21,6	18,9	22,3	19,1	22,4
Finland	-	-	-	-	15,6	20,5	17,1	21,9	19,2	23,6	19,5	24,0
France	15,6	19,5	16,2	20,8	17,3	22,4	19,0	24,1	20,4	25,5	-	-
Germany <sup>1)3)</sup>	15,5	18,4	15,1	18,9	16,4	20,7	17,4	21,7	19,4	23,6	19,7	23,8
Netherlands	17,7	19,7	16,8	20,5	17,5	22,6	18,1	23,1	19,1	23,4	19,5	23,5
Spain	16,5	19,2	16,8	20,0	18,4	22,1	19,1	23,3	20,3	24,9	-	-
United Kingdom	15,0	18,9	15,2	19,8	15,9	20,4	17,5	21,8	19,4	23,0	-	-
EU (15)	15,9	19,0	15,9	19,8	16,8	21,2	18,2	22,5	19,7	24,1	20,1	24,2

1) 1960 West-Germany without Berlin.- 2) 1970 West-Germany.- 3) 1970 and 1980 West-Germany.  
Source: Eurostat, Population Statistics 2004; Federal Statistical Office Germany.

Thus, the main focus of the AGIR work package (WP) 4 lies on the development of life expectancy at older ages and the question of to what extent further improvements in life expectancy can be anticipated. Studies show that in the past the further development of life expectancy was mostly underestimated. If life expectancy is computed by cohorts and not by periods, a higher life expectancy of five years can be assumed (Bomsdorf, 1993). Furthermore, Oeppen & Vaupel (2002) showed in an analysis with worldwide data that since 1840 the life expectancy in the record-holding country has risen at a steady pace of almost three months per year for women. The record life expectancy has also risen linearly for men, albeit more slowly (2.2 months). Therefore, it may be that we can also expect a linear increase in life expectancy for the future. This idea is controversial as discussed by demographic experts. The majority of the experts assume that using an approach of the observed life expectancy to the maximum life span – which is assumed to be 120 years – the further increase will be not linear, but declining (see for example Birg, 2000 and Eurostat, 1998).

Kannisto (1994) analysed the development of the oldest-old mortality rate between 1950 and 1990 for 28 developed countries. The study shows that the mortality rate in older ages has undergone a substantial transformation in the developed countries during the post-war period, reaching much lower levels than have been recorded before. The so-called ‘new stage’ in mortality transition can be traced back to advances in medicine and in living conditions and to the fact that older persons have received increasing

medical attention. The main beneficiaries of these advances are the elderly persons aged from their 60s to their 80s and 90s and, to a hardly lesser extent, even beyond.

The population development under alternative assumptions regarding further life expectancy is basic information for the forecast of health care and long-term care utilisation. In view of the previous studies, particular attention was given to further developments in the mortality of the elderly. The AGIR participants<sup>1</sup> discussed in several meetings whether it would be valuable to make own-population projections based on the assumptions of the experts of a single country or if it is acceptable to use the widespread and well-known Eurostat population forecast. Finally it was decided to use the baseline scenario from Eurostat, which was specially prepared for the EU-EPC Working Group for Ageing in 2000 (EU-EPC, 2000), but to make additional scenarios with higher life expectancies taking into account an additional reduction in mortality rates. The CPB (Pellikaan & Westerhout, 2004) created three living-longer scenarios:

- the living-longer low scenario, which reduces the mortality rates of people aged 55 to 85 stepwise to 20% until 2050;
- the living-longer middle scenario, which reduces the mortality rates of people aged 20 to 90 by 35.7% until 2050; and
- the living-longer high scenario, which reduces the mortality rates of persons aged 20 to 90 by 50% in gradual equal steps until 2050 (performed for all scenarios in addition to the reduction of mortality rates in the Eurostat baseline scenario).

In all alternative scenarios the assumptions about the development of the total fertility rates and the migration flows are the same as in the baseline scenario from Eurostat.

Table 1.3 shows the assumptions from Eurostat for the baseline scenario and for the three alternative mortality scenarios. Generally, an overall increase in fertility rates is expected from Eurostat. On average the EU (15) fertility rate is expected to rise from 1.5 in 1999 to 1.8 in 2050. In Belgium, Denmark, France, the Netherlands and the UK the total fertility rate does indeed rise up to 1.8 by 2050 (Eurostat baseline scenario). For Finland (1.7), Germany and Spain (both 1.5), the fertility rate is expected to be lower than in the other participating countries. Eurostat gives no clear explanation as to why they expect an overall increase in fertility rates. In a discussion about the assumptions from Eurostat, the experts of the single participating countries mostly assume no increase in fertility rates.

Where the net migration is held nearly constant in the Eurostat baseline scenario,<sup>2</sup> the average EU (15) life expectancy at birth for men is projected to rise by five years from 75 years in 2000 to 80 years in 2050; for women an increase of four years is expected (from 81 years to 85 years in 2050 – Eurostat baseline scenario). It is anticipated that the life expectancy in all participating countries will increase, but the rates of change

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<sup>1</sup> FPB (Belgium), Terkel Christiansen (Denmark), ETLA (Finland), Legos (France), DIW (Germany), CPB (the Netherlands), FEDEA (Spain), NIESR (the UK) and CEPS (Belgium).

<sup>2</sup> Eurostat take into consideration the effect of EU enlargement on migration in another scenario with higher migration, but in the baseline scenario the migration trends in the past were used for the forecast.

vary between 1999 and 2050. The highest gain in life expectancy is expected for Finland with a rate of 6.5% and the lowest is expected for the Netherlands with 3.8%

*Table 1.3 Assumptions of population forecasts*

Countries	Fertility rates		Life expectancy					Migration	
	1999	2050	1999	2050	2050			1999	2050
	Eurostat-baseline scenario		Scenario living-longer-...			Eurostat-baseline scenario			
				low	middle	high			
Belgium	1,5	1,8	78,2	83,0	84,1	86,1	87,7	10 978	15 000
Denmark	1,8	1,8	77,0	81,4	82,8	84,9	86,7	10 876	10 000
Finland	1,7	1,7	77,9	82,9	84,1	86,1	87,8	5 499	5 000
France	1,7	1,8	79,2	83,8	84,9	87,0	88,5	50 230	50 000
Germany	1,4	1,5	78,3	82,9	84,1	86,2	87,8	192 000	200 000
Netherlands	1,7	1,8	78,6	81,5	82,8	84,9	86,7	32 594	35 000
Spain	1,2	1,5	79,0	82,4	83,6	85,7	87,4	30 257	60 000
United Kingdom	1,7	1,8	78,2	82,9	84,2	86,2	87,9	175 000	70 000
EU (15)	1,5	1,8	78,0	82,6	83,8	85,8	87,4	637 254	622 000

Living-longer-scenario: Fertility rates and migration same assumptions as baseline-scenario, life expectancy higher as a result of 20% (low), 35,7% (middle) and 50% (high) reduction of mortality rates between 55 and 85 years (low) and between 20 to 90 years (middle and high).  
Sources: EU-EPC 2000 (Baseline scenario); Pellikaan/Westerhout 2004 (Living-longer scenarios).

The living-longer scenarios expect a higher increase in life expectancies. In the living-longer low scenario the life expectancy is around 1.1 to 1.3 years higher as in the baseline scenario in 2050. In the living-longer middle scenario, an additional gain is assumed in life expectancy of around 3.1 to 3.5 years and in the living-longer high an additional increase of around 4.7 to 5.3 years is assumed (2050).

### 1.1.2 Population development

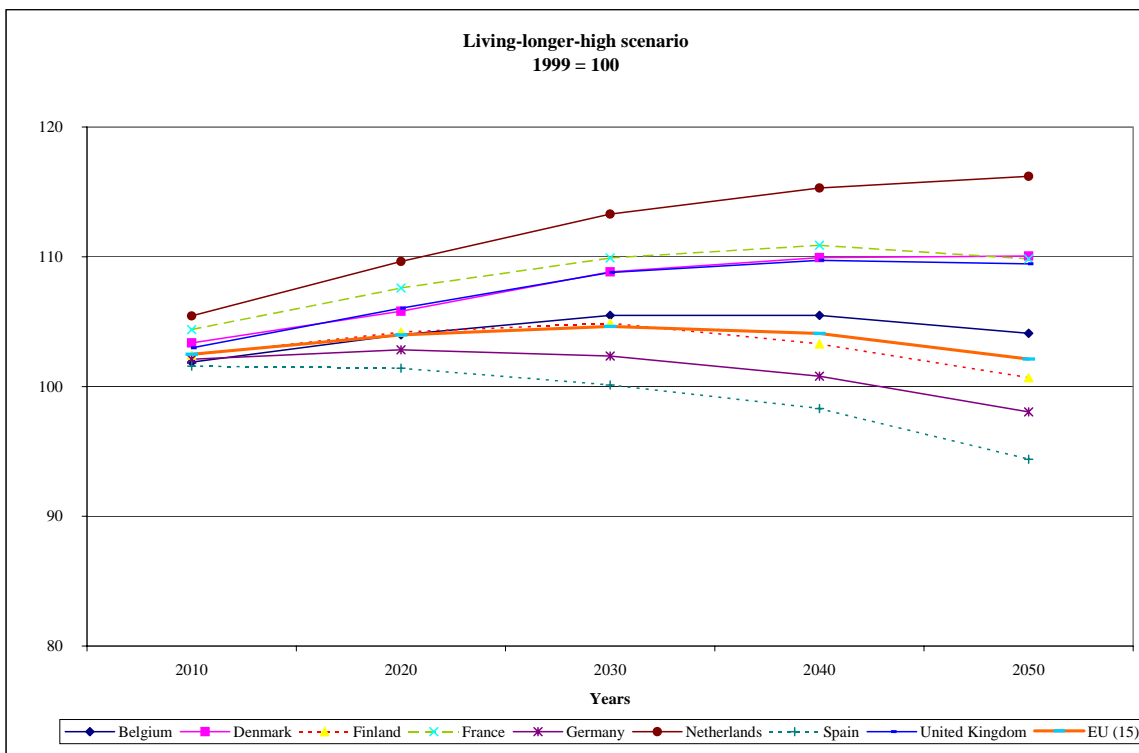
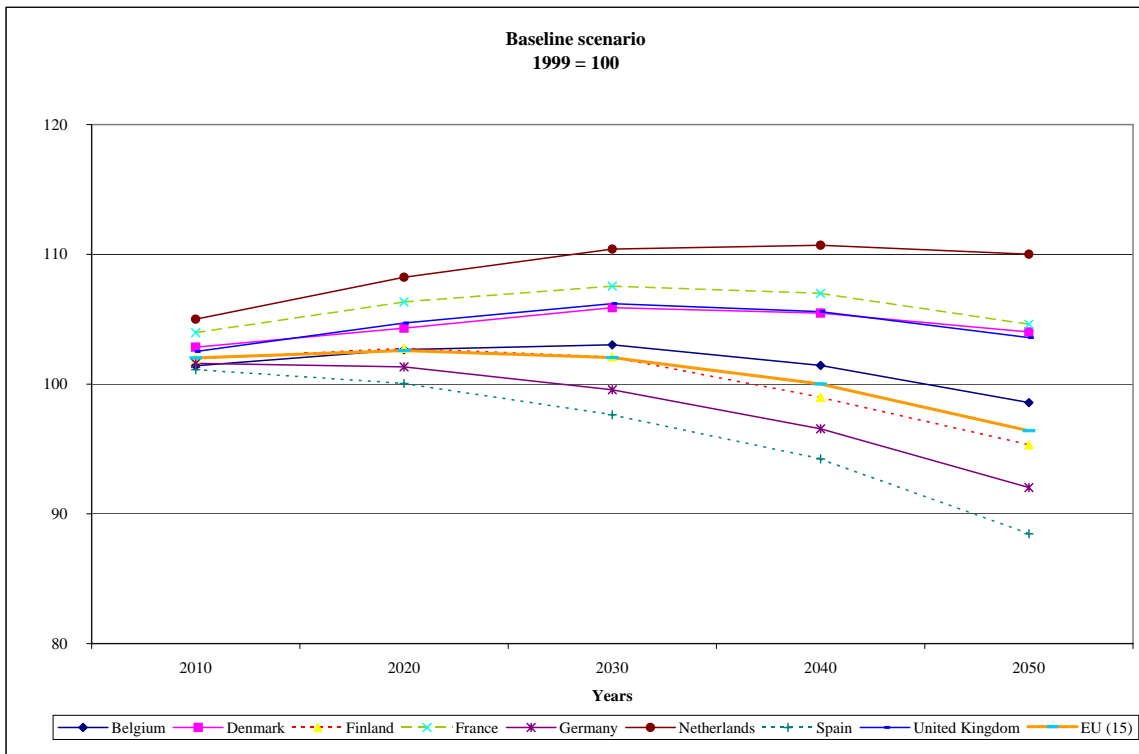
In 1999 around 375 million people lived in the EU (15) (Table 1.4). The population will increase in the next 20 years in the baseline and living-longer low scenarios. If the increase in life expectancy is higher, a growth of the population is expected for the next 30 years (living-longer middle and high scenarios), but after 2020-30 a decline is expected in all scenarios. In the baseline scenario, 363 million people are projected to live in the EU (15) in 2050; in the living-longer low (middle/high) scenario the population forecast is around 5 (14/22) million higher (2050). Whereas the total EU (15) population decreases until 2050 in the baseline and living-longer low scenarios, the population in the living-longer middle and living-longer high scenarios is higher in 2050 than in the base year.

*Table 1.4 Population development (million persons)*

Countries	1999	2001	2010	2020	2030	2040	2050
Baseline scenario							
Belgium	10,2	10,2	10,4	10,5	10,5	10,4	10,1
Denmark	5,3	5,4	5,5	5,6	5,6	5,6	5,5
Finland	5,2	5,2	5,3	5,3	5,3	5,1	4,9
France	59,2	59,6	61,5	62,9	63,7	63,3	61,9
Germany	82,1	82,5	83,5	83,2	81,8	79,3	75,6
Netherlands	16,0	16,2	16,8	17,3	17,6	17,7	17,6
Spain	39,4	39,5	39,9	39,5	38,5	37,2	34,9
United Kingdom	59,5	59,8	61,0	62,3	63,2	62,8	61,6
Total	277,0	278,5	283,8	286,6	286,3	281,4	272,2
EU (15)	376,3	378,0	383,8	386,0	384,0	376,3	362,7
Living-longer-low scenario							
Belgium	10,2	10,2	10,4	10,5	10,6	10,5	10,2
Denmark	5,3	5,4	5,5	5,6	5,7	5,7	5,6
Finland	5,2	5,2	5,3	5,3	5,3	5,2	5,0
France	59,2	59,6	61,6	63,1	64,1	63,9	62,7
Germany	82,1	82,5	83,6	83,6	82,4	80,3	76,9
Netherlands	16,0	16,2	16,8	17,4	17,8	17,9	17,8
Spain	39,4	39,5	39,9	39,6	38,8	37,6	35,5
United Kingdom	59,5	59,8	61,1	62,5	63,7	63,5	62,6
Total	277,0	278,5	284,2	287,7	288,3	284,6	276,4
EU (15)	376,3	378,0	384,4	387,5	386,8	380,6	368,4
Living-longer-middle scenario							
Belgium	10,2	10,2	10,4	10,6	10,7	10,7	10,5
Denmark	5,3	5,4	5,5	5,6	5,8	5,8	5,8
Finland	5,2	5,2	5,3	5,4	5,4	5,3	5,1
France	59,2	59,6	61,7	63,5	64,6	64,9	64,0
Germany	82,1	82,5	83,7	84,1	83,4	81,7	78,9
Netherlands	16,0	16,2	16,8	17,5	18,0	18,2	18,2
Spain	39,4	39,5	40,0	39,8	39,2	38,3	36,5
United Kingdom	59,5	59,8	61,2	62,9	64,3	64,5	64,0
Total	277,0	278,5	284,7	289,3	291,2	289,2	282,9
EU (15)	376,3	378,0	385,1	389,6	390,6	386,8	377,2
Living-longer-high scenario							
Belgium	10,2	10,2	10,4	10,6	10,8	10,8	10,6
Denmark	5,3	5,4	5,5	5,6	5,8	5,9	5,9
Finland	5,2	5,2	5,3	5,4	5,4	5,3	5,2
France	59,2	59,6	61,8	63,7	65,1	65,6	65,0
Germany	82,1	82,5	83,9	84,5	84,1	82,8	80,5
Netherlands	16,0	16,2	16,9	17,5	18,1	18,4	18,6
Spain	39,4	39,5	40,1	40,0	39,5	38,8	37,2
United Kingdom	59,5	59,8	61,3	63,1	64,7	65,3	65,1
Total	277,0	278,6	285,1	290,4	293,5	292,9	288,2
EU (15)	376,3	378,0	385,6	391,2	393,7	391,7	384,3

Sources: EU-EPC 2000 (Baseline scenario); Pellikaan/Westerhout 2004 (Living-longer scenarios).

Figure 1.1 Population development in the EU and selected countries





In the baseline scenario, four countries among those participating experience an increase in population (Denmark, France, the Netherlands and the UK) and four countries a decrease (Belgium, Finland, Germany and Spain) until 2050 (Figure 1.1 and Table A1). In the living-longer high scenario, only Germany and Spain experience a decrease. The population development in the living-longer low and middle scenarios are between the results of the baseline scenario and the living-longer high scenario. The differences between the single scenarios are not too large; therefore, the following sections focus only on the baseline scenario and the living-longer high scenario as the two scenarios with the highest difference in the results of population development.

In all EU countries the population is growing older. In the participating countries altogether around 18 million people were aged 75 to 89 in 1999, contributing to the EU (15) total of 25 million (Table 1.5). By 2050 the figure is forecast to double in the baseline scenario. In 1999, 1.6 million people aged 90+ lived in the participating countries altogether and in the EU (15) the figure was 2.1 million. The number of these 'oldest old' will triple by 2050 in the baseline scenario. As a result of the reduced mortality rates in the middle and higher ages, the number of the oldest old is markedly higher in the living-longer high scenario in 2050. The number of people aged 90+ accounts for around 8.5 million in the participating countries altogether and for around 11.5 million in the EU (15).

*Table 1.5 Population development by age group (per 1000 persons)*

Countries	Baseline scenario						Living-longer-high scenario					
	Age-groups											
	0 - 14	15 - 59	60 - 74	75 - 89	90+	total	0 - 14	15 - 59	60 - 74	75 - 89	90+	total
1999												
Belgium	1 795	6 190	1 506	677	54	10 222	1 795	6 190	1 506	677	54	10 222
Denmark	983	3 299	674	347	29	5 332	983	3 299	674	347	29	5 332
Finland	943	3 204	694	310	21	5 172	943	3 204	694	310	21	5 172
France	11 145	35 909	7 927	3 809	405	59 194	11 145	35 909	7 927	3 809	405	59 194
Germany	12 915	50 380	13 098	5 274	477	82 144	12 915	50 380	13 098	5 274	477	82 144
Netherlands	2 978	10 092	1 945	902	68	15 985	2 978	10 092	1 945	902	68	15 985
Spain	5 940	24 970	5 726	2 612	185	39 432	5 940	24 970	5 726	2 612	185	39 432
United Kingdom	11 390	35 994	7 785	3 965	370	59 503	11 390	35 994	7 785	3 965	370	59 503
Total	48 089	170 038	39 355	17 895	1 609	276 985	48 089	170 038	39 355	17 895	1 609	276 985
EU (15)	63 565	231 328	54 519	24 721	2 148	376 282	63 565	231 328	54 519	24 721	2 148	376 282
2020												
Belgium	1 620	5 913	1 970	900	92	10 495	1 620	5 926	2 001	972	112	10 631
Denmark	879	3 232	963	455	34	5 562	879	3 240	986	495	42	5 642
Finland	830	2 935	1 057	452	42	5 315	830	2 942	1 077	489	51	5 389
France	10 470	35 396	11 292	5 096	688	62 942	10 470	35 485	11 476	5 448	806	63 686
Germany	11 243	47 714	15 183	8 363	733	83 236	11 243	47 828	15 449	9 064	890	84 474
Netherlands	2 834	10 017	3 055	1 289	106	17 302	2 834	10 040	3 118	1 404	130	17 526
Spain	5 283	23 428	6 842	3 499	400	39 452	5 283	23 491	6 958	3 778	480	39 990
United Kingdom	10 146	36 307	10 562	4 786	502	62 303	10 146	36 375	10 769	5 205	607	63 102
Total	43 305	164 942	50 924	24 840	2 597	286 607	43 305	165 326	51 833	26 856	3 119	290 439
EU (15)	56 850	222 283	68 896	34 386	3 591	386 006	56 850	222 791	70 109	37 158	4 314	391 221
2050												
Belgium	1 549	5 252	1 777	1 326	172	10 076	1 549	5 281	1 856	1 654	304	10 643
Denmark	874	3 079	870	654	69	5 546	874	3 099	924	844	127	5 869
Finland	728	2 607	910	599	86	4 930	728	2 624	954	751	151	5 207
France	9 571	32 107	10 768	8 207	1 267	61 920	9 571	32 319	11 251	9 858	2 016	65 013
Germany	9 764	39 016	14 316	11 026	1 471	75 593	9 764	39 236	15 002	13 949	2 581	80 533
Netherlands	2 900	9 816	2 774	1 885	211	17 585	2 900	9 873	2 931	2 465	406	18 575
Spain	4 289	17 032	7 109	5 803	649	34 882	4 289	17 155	7 480	7 172	1 130	37 226
United Kingdom	9 550	32 775	10 630	7 661	1 016	61 631	9 550	32 923	11 141	9 726	1 788	65 127
Total	39 224	141 684	49 153	37 161	4 940	272 163	39 224	142 509	51 539	46 418	8 503	288 192
EU (15)	51 091	187 261	66 184	51 484	6 723	362 743	51 091	188 325	69 333	63 987	11 514	384 250

Sources: EU-EPC 2000 (Baseline scenario); Pellikaan/Westerhout 2004 (Living-longer scenarios).

Finland will experience the highest increase in their oldest-old population. The number of people aged 90+ will be four times higher in 2050 than in 1999 (baseline scenario) and seven times higher in the living-longer high scenario (Table 1.6). Denmark will experience the lowest increase in their oldest-old population: in the baseline scenario the number of people aged 90+ will double and in the living-longer high scenario it will quadruple. Generally, in the participating countries the combined number of persons aged under 60 years in 2050 will be around 80% of the basic figure in 1999, the number of persons aged 60-74 (the younger old) will increase up to 125% (131%), the older population (aged 75-89) will double (260%) and the oldest old (90+) will triple (528%) in the baseline scenario (living-longer high scenario). Thus the development is nearly the same in the participating countries altogether as in the EU (15).

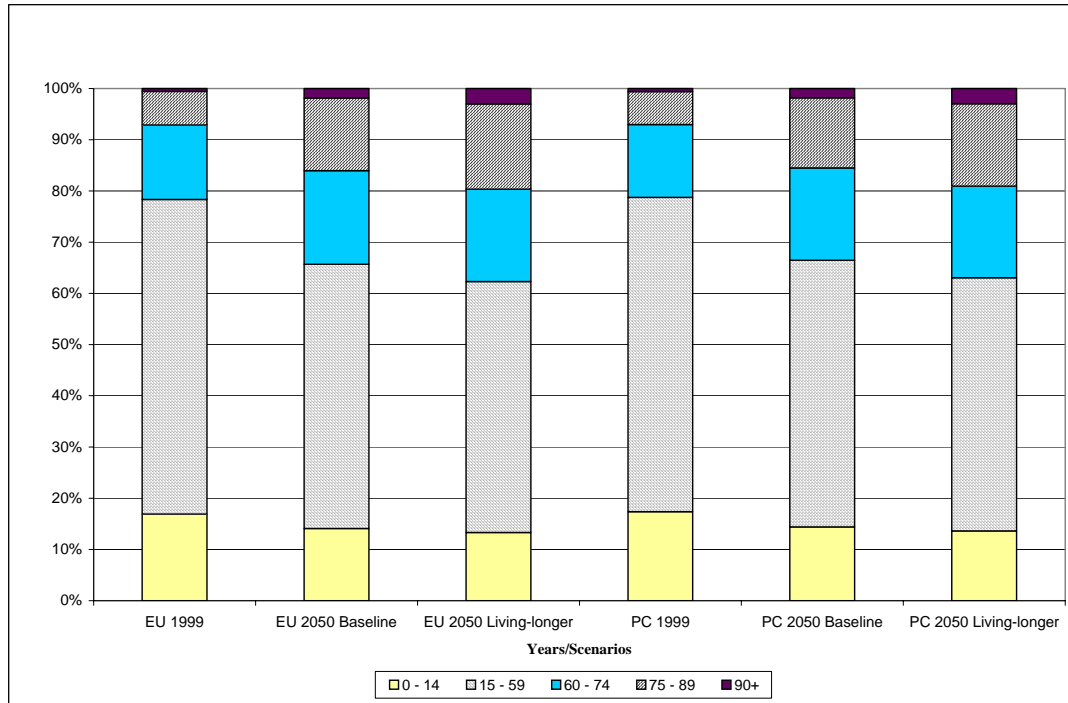
*Table 1.6 Population development by age group (1999 = 100)*

Countries	Baseline scenario						Living-longer-high scenario					
	Age-groups											
	0 - 14	15 - 59	60 - 74	75 - 89	90+	Total	0 - 14	15 - 59	60 - 74	75 - 89	90+	Total
2020												
Belgium	90	96	131	133	171	103	90	96	133	144	208	104
Denmark	89	98	143	131	116	104	89	98	146	143	142	106
Finland	88	92	152	146	199	103	88	92	155	158	243	104
France	94	99	142	134	170	106	94	99	145	143	199	108
Germany	87	95	116	159	154	101	87	95	118	172	187	103
Netherlands	95	99	157	143	155	108	95	99	160	156	190	110
Spain	89	94	120	134	216	100	89	94	122	145	260	101
United Kingdom	89	101	136	121	136	105	89	101	138	131	164	106
Total	90	97	129	139	161	103	90	97	132	150	194	105
EU (15)	89	96	126	139	167	103	89	96	129	150	201	104
2050												
Belgium	86	85	118	196	321	99	86	85	123	244	566	104
Denmark	89	93	129	189	232	104	89	94	137	243	432	110
Finland	77	81	131	194	410	95	77	82	137	242	718	101
France	86	89	136	216	313	105	86	90	142	259	498	110
Germany	76	77	109	209	309	92	76	78	115	265	542	98
Netherlands	97	97	143	209	308	110	97	98	151	273	594	116
Spain	72	68	124	222	351	88	72	69	131	275	611	94
United Kingdom	84	91	137	193	275	104	84	91	143	245	483	109
Total	82	83	125	208	307	98	82	84	131	259	528	104
EU (15)	80	81	121	208	313	96	80	81	127	259	536	102

Sources: EU-EPC 2000 (Baseline scenario); Pellikaan/Westerhout 2004 (Living-longer scenarios).

For all the participating countries, massive displacements in the age structure were expected with the greatest displacements anticipated for Spain (Figure 1.2 and Tables A2 and A3): the share of active Spanish people aged 15 to 59 will decrease by 15 percentage points (from 63% in 1999 to 49% in the baseline scenario and to 46% in the living-longer high scenario in 2050), whereas the share of people aged 75-89 will increase by 10 percentage points (from 7% to 17% in the baseline scenario and to 19% in the living-longer high scenario). The changing age structure will lead to an increase in the old age dependency ratio in all EU countries.

Figure 1.2 Age structure of the population in the EU and participating countries altogether (PC)



## 1.2 Health scenarios

Alongside the ageing process, health status has an important influence on health care utilisation and health care expenditure. Therefore, one task of WP4 has been to generate alternative health scenarios. If the hypothesis of increasing life expectancy being connected with ‘living longer in better health’ is true, then it could be expected that the changes in the health of the elderly have important consequences for the further demand of health care services, the need for long-term care and also for the development of health care expenditures. Better health suggests that the demand for health and long-term care by the elderly could decrease. Hence the development of health care expenditures could be more moderate than in the case of a static projection with constant, age-specific morbidity rates.

### 1.2.1 Life expectancy and changes in health status

The AGIR WP1 study on bio-demographic aspects of ageing carried out by FEDEA focused on the following question: Is increasing life expectancy connected with living longer in better health (Ahn et al., 2003)? Whereas data on life expectancy are available for all countries as long-time series, data about the health status of a population are rare. Information about self-assessed health are available from national health surveys (NHS) and the European Community Household Panel (ECHP). But an overall clear trend in self-assessed health could not be observed in the past, neither from the NHS data nor from the ECHP. Based on the data from the ECHP, FEDEA (Ahn et al., 2003)

calculated life expectancies in good health (LEGH) and disability-free life expectancies (DFLE). But these indicators do not show a clear trend in the past either: Spain, Ireland, Greece and Italy seem to improve in the health of their populations, while Portugal and France appear to have a deteriorating trend. In view of these results FEDEA concludes “We think it is difficult to establish any coherent set of hypotheses for projections of health status based on past trends” (Ahn et al., 2003, p. 66). The same conclusion is drawn from the analyses based on NHS: “In summary, our examination of the data from the National Health Surveys leads us to conclude that it is impossible to establish any trend of health status and health expectancy using these data” (Ahn et al., 2003, p. 67).

In view of these results additional analyses were done with data from the ECHP. It could be shown that a higher level of education is connected with a better health status. Therefore, FEDEA concludes that a more educated population will lead to improvements in the health status of the EU population. For the future, an increase of the average level of education of the population is assumed and thus improvements in the health status can be expected.

FEDEA used the concept of health-adjusted life expectancies to create two health scenarios. The first scenario assumes that the proportion of good health expectancies and life expectancies stays constant at the average level of the period 1994-98 (based on data from the ECHP). The second scenario assumes that good health expectancies increase by the same number of years as life expectancies, thus implying that any gain in life years is free of health and disability problems. They calculated life expectancy in good health (LEGH), disability-free life expectancy (DFLE) and severe disability-free life expectancy (SDFLE) at age 15 and 65 for men and women for 2010 and 2025.

The calculation of life expectancies in good health is used for the projection of health care utilisation in chapter 3. Based on data from the ECHP it is possible to forecast the population aged 15+ differentiated by health status. In the ECHP, people were asked “How is your health in general – very good, good, fair, bad or very bad?”. These five answer categories were grouped in this study to very good/good, fair, bad/very bad and the proportion of people in these three health categories were calculated. FEDEA implies in their first health scenario that the health status of the population remains constant (constant health status), while the second health scenario leads to a higher share of people in good health, because additional years are assumed to be years in good health (better health scenario). To calculate the changes in the share of people in good health, the differences in the growth rates of LEGH between the first (constant health status) and the second scenarios (improvements in health) are used for the projection to 2025. From 2025 to 2050 the growth rate of life expectancy is much lower than between 2010 and 2025 (the assumption of the Eurostat baseline scenario) and thus it is also assumed that the growth rates of the share of people in good health are more moderate (two-thirds of the growth rate between 2010 and 2025). FEDEA calculated that improvements in life expectancy in good health are higher for people aged 65 than for people aged 15. Thus, the projection made in this part also takes the latter into account.

Table 1.7 Share of people aged 15+ in good/very good, fair, bad/very bad health (2001, 2020 and 2050)

Age-groups	2001			2020			2050		
	Share of people in ... health								
	good <sup>1)</sup>	fair	bad <sup>2)</sup>	good <sup>1)</sup>	fair	bad <sup>2)</sup>	good <sup>1)</sup>	fair	bad <sup>2)</sup>
Belgium									
15-29	0,91	0,08	0,01	0,93	0,07	0,00	0,94	0,06	0,00
30-44	0,84	0,12	0,03	0,86	0,13	0,01	0,87	0,13	0,00
45-59	0,73	0,22	0,05	0,74	0,22	0,03	0,75	0,23	0,02
60-69	0,58	0,35	0,07	0,61	0,36	0,03	0,63	0,36	0,00
70-79	0,48	0,40	0,13	0,50	0,41	0,09	0,52	0,41	0,06
80+	0,39	0,45	0,16	0,41	0,46	0,13	0,42	0,47	0,11
Denmark									
15-29	0,91	0,08	0,01	0,91	0,08	0,00	0,92	0,08	0,00
30-44	0,84	0,13	0,03	0,85	0,13	0,02	0,86	0,13	0,01
45-59	0,75	0,20	0,05	0,76	0,20	0,04	0,76	0,20	0,03
60-69	0,62	0,28	0,10	0,64	0,28	0,08	0,66	0,29	0,05
70-79	0,52	0,32	0,16	0,54	0,32	0,14	0,55	0,33	0,12
80+	0,40	0,36	0,24	0,41	0,37	0,22	0,42	0,37	0,20
Finland									
15-29	0,89	0,10	0,01	0,91	0,09	0,00	0,92	0,08	0,01
30-44	0,84	0,15	0,01	0,85	0,15	0,00	0,86	0,14	0,00
45-59	0,56	0,38	0,06	0,57	0,39	0,04	0,58	0,39	0,03
60-69	0,40	0,51	0,09	0,42	0,52	0,06	0,44	0,53	0,03
70-79	0,24	0,62	0,15	0,25	0,63	0,11	0,26	0,64	0,09
80+	0,15	0,52	0,34	0,16	0,53	0,31	0,16	0,54	0,30
France									
15-29	0,79	0,19	0,02	0,81	0,18	0,01	0,83	0,17	0,00
30-44	0,69	0,27	0,04	0,71	0,27	0,02	0,73	0,28	0,00
45-59	0,55	0,37	0,08	0,57	0,38	0,06	0,58	0,38	0,04
60-69	0,42	0,45	0,13	0,46	0,48	0,07	0,48	0,49	0,03
70-79	0,28	0,54	0,19	0,30	0,56	0,13	0,32	0,58	0,10
80+	0,20	0,59	0,21	0,22	0,61	0,16	0,24	0,63	0,13
Germany									
15-29	0,76	0,19	0,06	0,79	0,19	0,02	0,82	0,18	0,00
30-44	0,62	0,29	0,09	0,65	0,30	0,06	0,67	0,30	0,03
45-59	0,38	0,40	0,22	0,40	0,41	0,19	0,42	0,41	0,17
60-69	0,25	0,48	0,28	0,28	0,51	0,21	0,31	0,53	0,16
70-79	0,17	0,48	0,36	0,19	0,51	0,30	0,21	0,53	0,26
80+	0,10	0,40	0,50	0,11	0,43	0,45	0,12	0,45	0,42
Netherlands									
15-29	0,88	0,10	0,02	0,89	0,10	0,00	0,90	0,10	0,00
30-44	0,83	0,15	0,03	0,84	0,15	0,02	0,85	0,15	0,00
45-59	0,71	0,24	0,05	0,72	0,24	0,04	0,72	0,24	0,03
60-69	0,58	0,35	0,07	0,60	0,36	0,04	0,62	0,36	0,01
70-79	0,47	0,43	0,10	0,49	0,44	0,07	0,51	0,44	0,05
80+	0,37	0,52	0,11	0,39	0,53	0,09	0,40	0,54	0,06
Spain									
15-29	0,92	0,07	0,02	0,93	0,07	0,00	0,95	0,05	0,00
30-44	0,83	0,14	0,03	0,84	0,14	0,02	0,85	0,14	0,01
45-59	0,65	0,26	0,09	0,66	0,26	0,07	0,67	0,26	0,06
60-69	0,42	0,37	0,21	0,46	0,38	0,16	0,48	0,39	0,13
70-79	0,31	0,41	0,28	0,33	0,43	0,24	0,35	0,44	0,21
80+	0,24	0,41	0,35	0,26	0,43	0,31	0,27	0,44	0,29
UK									
15-29	0,78	0,17	0,05	0,80	0,17	0,03	0,81	0,17	0,02
30-44	0,73	0,19	0,08	0,75	0,19	0,06	0,76	0,19	0,05
45-59	0,70	0,20	0,10	0,71	0,20	0,08	0,73	0,20	0,07
60-69	0,61	0,28	0,11	0,65	0,28	0,06	0,68	0,29	0,03
70-79	0,54	0,31	0,15	0,58	0,32	0,10	0,60	0,33	0,07
80+	0,49	0,32	0,19	0,52	0,33	0,15	0,54	0,34	0,12
EU (15 without Lux, Swe)									
15-29	0,85	0,13	0,03	0,86	0,13	0,01	0,87	0,12	0,01
30-44	0,77	0,19	0,05	0,78	0,19	0,03	0,79	0,19	0,02
45-59	0,61	0,29	0,09	0,63	0,29	0,08	0,64	0,30	0,07
60-69	0,43	0,39	0,18	0,46	0,40	0,14	0,48	0,41	0,11
70-79	0,32	0,43	0,26	0,33	0,44	0,23	0,35	0,45	0,20
80+	0,24	0,42	0,34	0,25	0,43	0,32	0,26	0,44	0,30

1) People in good and very good health.- 2) People in bad and very bad health.

Sources: ECHP; calculations by DIW.

Table 1.7 shows the results of the health status projection. In the first health scenario the observed share of people in good/very good health, fair health and bad/very bad health by age group in the single country and in the EU (15 without Luxembourg or Sweden) in 2001 is held constant over the forecast period. In the second health scenario the share of people in good health increases. Based on the assumptions of WP1, France and Germany will experience the highest improvements in health and the Netherlands the lowest, but in all countries the share of people in bad/very bad health decreases to an appreciable degree until 2050. The differences in the proportion of people in good, fair and bad health between the single countries in 2001 cannot only be explained by real differences in health status. The self-assessed health status is also influenced by other factors, such as culture or traditional behaviour. Thus, the health scenarios are used to show the effect of improvements in health within the countries, but not to explain different developments between the countries.

### 1.2.2 Population development by health status

These health scenarios combined with the two demographic scenarios – the baseline scenario and the living-longer high scenario – yield four further scenarios as illustrated in Table 1.8:

- a baseline scenario with constant health status (1);
- a living-longer scenario with constant health status (2);
- a baseline scenario with improvements in health (3); and
- a living longer in better health scenario (4).

*Table 1.8 Population scenarios by health status*

Demographic scenarios	Health scenarios	
	constant proportion of people in good/fair/bad health	increasing proportion of people in good health
Baseline scenarios	baseline scenario with constant health	baseline scenario with improvements in health
Living-longer-high scenarios	living-longer scenario with constant health	living-longer in better health scenario

For these four scenarios the population aged 15+ as subdivided by health status can be projected until 2050. Table 1.9 and Figure 1.3 show the population development between 2001 and 2050 in the four scenarios. The difference between the baseline scenario and the living-longer scenario shows the effect of improvements in life expectancy, the difference with the baseline better-health scenario reveals the effect of improvements in health status and the difference with the living longer in better health scenario shows the combination of these effects.

In the participating countries around 140 million people aged 15+ were in good health (61%), 64 million were in fair health (28%) and 26 million (11%) were in bad health in

2001 (Table 1.9). The analogue figures for the EU (15 without Luxembourg or Sweden) were 197 million in good health (64%), 78 million in fair health (26%) and 32 million in bad health (10%). In the baseline scenario (with constant age-specific health status) the number of people in good health will decrease, while the number of people in fair and bad health will increase between 2001 and 2050 in the EU and in the participating countries altogether. Whereas the total population aged 15+ is expected to be nearly the same in 2050 as in the base year, the number of people in good health will decrease by 11% (EU) and 8% (participating countries), the number of people in fair health will increase by 11% (EU and participating countries) and the number of people in bad health will increase by 31% (EU) and 24% (participating countries) (Figure 1.3 and Table A4). The ageing process leads to a reduction of the proportion of people in good health (to 56% in the participating countries and 58% in the EU in 2050), although the health status in the single age group and country is held constant.

In the living-longer scenario with higher life expectancies, the increase of people in bad health will be much higher. The number of people in bad health rises by 51% in the EU and by 41% in the participating countries altogether between 2001 and 2050. Thus, the proportion of people in good health will decline to 54% in the participating countries combined and to 56% in the EU in 2050, while the proportion of people in bad health will increase to nearly 15%.

Improvements in health status lead to a contrary effect. In the baseline scenario with improvements in health the share of people in bad health in 2050 at 8% (participating countries) and 10% (EU) is lower than in the base year and significantly lower than in the baseline scenario in 2050.

The results of the living longer in better health scenario show that the effects of improvements in health compensate for the effect of an additional increase in life expectancy. Improvements in health reduce the proportion of people in bad health by 5.5 percentage points in the participating countries and by 3.9 percentage points in the EU in 2050, while a higher life expectancy leads to an increase of the proportion of people in bad health by 1 percentage point in the EU and 0.7 percentage points in the participating countries (living-longer scenario).

According to the assumptions, the changes between 2001 and 2050 in the single age group for people in good, fair or bad health are the same in the two scenarios with constant health status. The highest increase is expected for the oldest persons aged 80+ by around 160% in the EU in the baseline scenario and 260% in the living-longer scenario. But improvements in health change these figures. The increase of persons aged 80+ in bad health will be lower, 120% in the baseline scenario with improvements in health and 210% in the living longer in better health scenario (EU), and the increase of persons aged 80+ in good health will be higher, 180% and 290% respectively (EU).

Table 1.9 Population aged 15+ by health status in 2001 and 2050

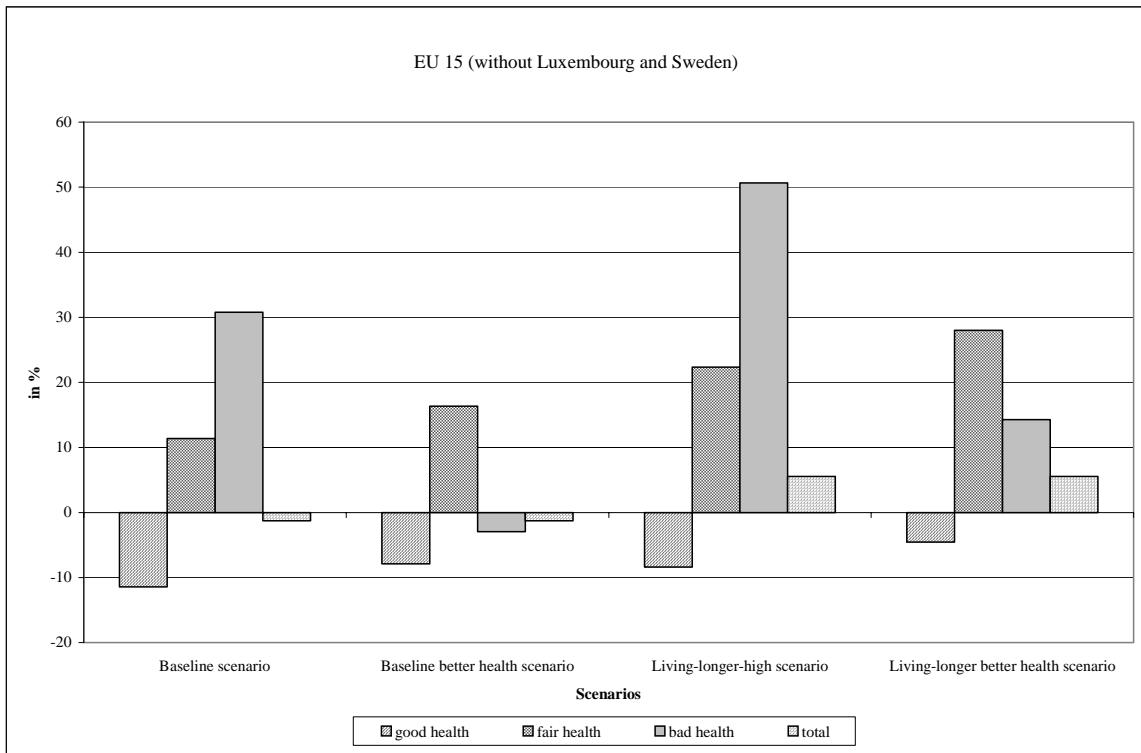
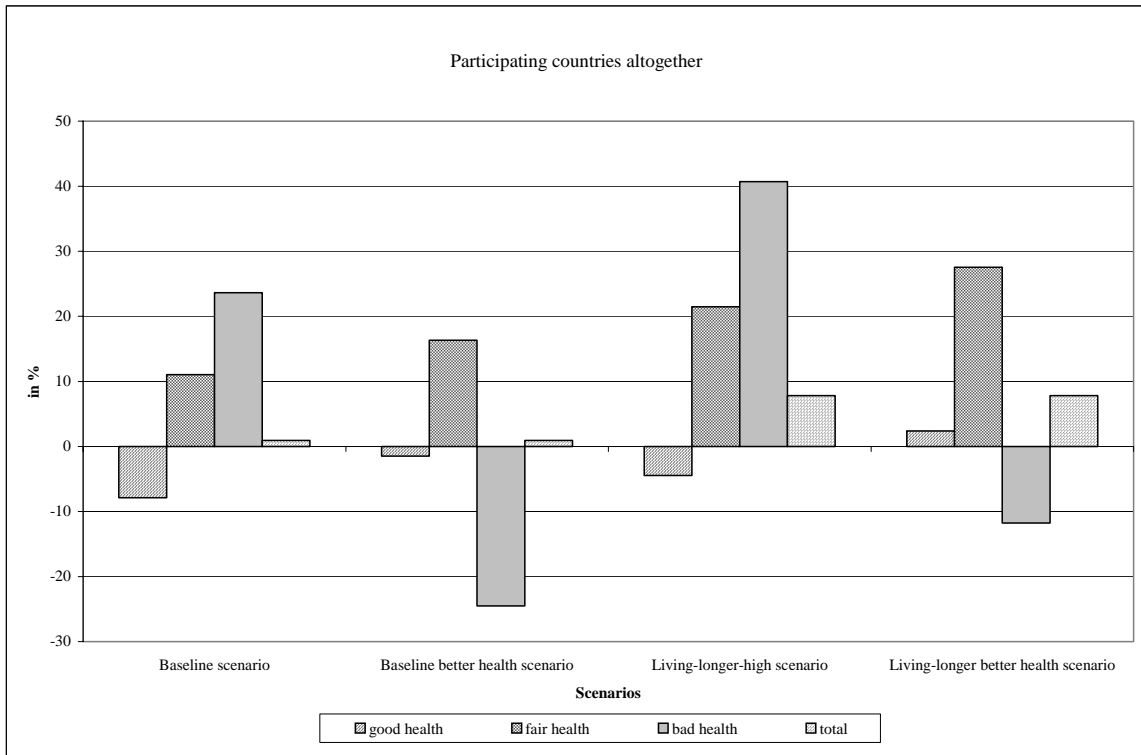
Countries	Number of people aged 15+ in million in			Proportion in %		
	good health	fair health	bad health	good health	fair health	bad health
2001 (Baseline scenario)						
Belgium	6,32	1,75	0,40	74,61	20,63	4,77
Denmark	3,30	0,79	0,27	75,69	18,20	6,12
Finland	2,74	1,28	0,25	64,13	29,95	5,92
France	28,61	16,28	3,71	58,86	33,49	7,64
Germany	33,14	23,88	12,74	47,50	34,24	18,26
Netherlands	9,68	2,89	0,61	73,42	21,93	4,65
Spain	23,26	7,09	3,33	69,07	21,05	9,88
UK	33,65	10,41	4,45	69,37	21,45	9,18
All	140,70	64,37	25,77	60,95	27,88	11,16
EU (15)*	197,36	78,26	31,71	64,22	25,46	10,32
2050 (Baseline scenario with constant age-specific health status)						
Belgium	5,97	2,05	0,51	69,99	24,03	5,98
Denmark	3,37	0,95	0,36	72,16	20,23	7,61
Finland	2,41	1,44	0,36	57,32	34,16	8,52
France	27,81	19,52	5,02	53,13	37,29	9,58
Germany	27,11	23,78	14,95	41,18	36,12	22,70
Netherlands	10,24	3,66	0,79	69,74	24,91	5,35
Spain	17,86	8,16	4,57	58,38	26,69	14,94
UK	34,83	11,93	5,32	66,88	22,90	10,22
All	129,60	87,16	41,47	55,64	30,68	13,68
EU (15)*	174,77	87,16	41,47	57,60	28,73	13,67
2050 (Living-longer scenario with constant age-specific health status)						
Belgium	6,22	2,29	0,59	68,35	25,15	6,50
Denmark	3,52	1,06	0,42	70,39	21,23	8,38
Finland	2,47	1,58	0,43	55,10	35,27	9,62
France	28,63	21,22	5,60	51,63	38,27	10,10
Germany	27,79	25,85	17,14	39,26	36,52	24,22
Netherlands	10,67	4,12	0,89	68,04	26,30	5,67
Spain	18,55	9,10	5,29	56,32	27,62	16,06
UK	36,64	13,01	5,93	65,93	23,41	10,66
All	134,47	78,22	36,28	54,01	31,42	14,57
EU (15)*	180,85	95,78	47,81	55,74	29,52	14,74
2050 (Baseline scenario with improvement in health)						
Belgium	6,21	2,09	0,23	72,87	24,45	2,68
Denmark	3,49	0,94	0,24	74,71	20,19	5,10
Finland	2,51	1,45	0,24	59,74	34,48	5,78
France	29,95	20,27	2,13	57,22	38,71	4,07
Germany	30,08	25,58	10,17	45,69	38,86	15,45
Netherlands	10,63	3,73	0,33	72,39	25,39	2,23
Spain	18,84	8,46	3,29	61,59	27,66	10,75
UK	36,89	12,36	2,83	70,83	23,73	5,44
All	138,61	74,87	19,46	59,50	32,14	8,35
EU (15)*	183,59	89,97	29,84	60,51	29,65	9,84
2050 (Living-longer in better health scenario)						
Belgium	6,48	2,33	0,28	71,28	25,67	3,05
Denmark	3,65	1,05	0,29	73,08	21,10	5,81
Finland	2,57	1,60	0,30	57,48	35,72	6,80
France	30,88	22,10	2,47	55,70	39,85	4,45
Germany	30,91	27,89	11,97	43,68	39,41	16,91
Netherlands	11,08	4,21	0,38	70,71	26,85	2,44
Spain	19,61	9,45	3,87	59,55	28,70	11,76
UK	38,89	13,50	3,19	69,97	24,29	5,74
All	144,08	82,14	22,75	57,87	32,99	9,14
EU (15)*	190,26	99,03	35,16	58,64	30,52	10,84

\*) Without Luxembourg and Sweden.

Source: Calculations by DIW.



Figure 1.3 Changes in the population aged 15+ by health status between 2001 and 2050



### 1.2.3 *Health status and health care utilisation*

The main aim of WP2 was to describe the current use of health and long-term care by the elderly and its past trends. For these analyses data could be collected on two levels. First, the participants of the AGIR project provided data based on national sources, mostly covering the whole population and for several years in the past. With these data, it was possible to calculate prevalence rates for hospital cases, contacts with a doctor and for long-term care-giving in institutions and to show their development over time. But with these data it was not possible to differentiate the utilisation by the health of the population.

Therefore, data from the ECHP were used to analyse the link between health care utilisation, health status and other determinants. These data are in general available for 1994 to 2001, but they cover only persons aged 15+ in private households. Persons in institutions are not included and the information about health care utilisation shows a bias because the elderly – especially persons in bad health – are under represented.

In view of these different data bases and the different advantages of each of these data sets two projections were made. Chapter 2 uses the prevalence rates based on national sources to project the hospital and outpatient utilisation as well as the long-term care-giving in institutions and from professional home care services. The results show the general development in utilisation and the effect of improvements in life expectancy. Chapter 3 uses the data from the ECHP and in combination with the four demographic and health scenarios four projections of health care utilisation were made.

Information about the number of people receiving long-term care at home is rare. For the most part, professional home care is the task of the community and is delivered by different providers. But professional home care is only a small proportion of the total home care. In chapter 2, a projection of this part of long-term care-giving at home is made. In most cases care-giving at home is provided by members of the family or other related persons, and no information on the total number of informal care-givers or people receiving informal care exists. The ECHP provides no information about the people in need of long-term care at home. But the ECHP provides data about persons who are hampered in their daily activities due to disability or a long-standing illness. To obtain an idea of the proportion of people in households in need of care, the share of the severely hampered persons is used. Jacobzone (1998) pointed out that severe disability is a good proxy for the need of long-term care. Thus, the share of persons severely hampered in daily activities, who had to cut down things they usually do based on the ECHP was used as a ‘soft proxy’ for the need of long-term care at home. Chapter 3 includes a projection of severely hampered persons.

### 1.2.4 *Trends in health care utilisation*

Regression analyses based on the ECHP showed that the use of inpatient and outpatient acute health care services are related to health status, age, gender, education, marital status and income. But with the data from the ECHP it is not possible to calculate a trend in health care utilisation. The sample size of the ECHP is limited, thus utilisation data for a single country have been calculated using a three-year average (1999 to 2001). The data are only available for 1994 to 2001, but – especially in view of the

three-year averages – this period is not long enough to show a significant trend. Thus, utilisation scenarios based on the ECHP cannot be created.

The country-specific data based on national sources showed that the increasing life expectancies were connected with higher inpatient utilisation rates in the past, with the exception of the Netherlands (Table 1.10). It is feasible that the improvements in life expectancy could be mainly realised by new and/or better hospital treatments arising from the availability of new technologies and surgical methods, and therefore lead to more hospital admissions. In several countries waiting lists for surgeries in hospitals already exist.

*Table 1.10 Trends in hospital utilisation*

Countries	Changes in hospital admissions/discharges		Length of hospital stay	
	Period	Changes	Period	Changes
Belgium	1991-1998	▲	1991-2000	▼
Denmark	1991-2001	▲	1991-2001	▼
Finland	1991-2001	▲	1991-2001	▼
France	1998-2000	▲	-	
Germany	1993-1999	▲	1993-1999	▼
Netherlands	1993-2000	▼	1993-2000	▼
Spain	1990-1999	▲	1990-1999	▼
United Kingdom (England)	1990/1-2000/1	▲	1990/1-2000/1	▼

Source: Schulz 2004 (AGIR WP2 Report).

While the prevalence rates of hospital admissions/discharges increased in the past, the average length of hospital stay has decreased over time. This trend is caused by new medical treatments, such as the increasing use of minimal invasive surgery and the de-institutionalisation strategy in most countries, and not by a better health status of the population. In Germany, for example, it is expected that the implementation of the Diagnosis Related Groups in 2003-04 will lead to fewer hospital days for patients, because this financial system implies incentives to reduce the number of bed days per patient.

The number of bed days (as a result of hospital admissions and length of hospital stay) shows a decreasing trend in the past. Table 1.11 shows the changes in hospital admissions per 1000 inhabitants, the length of hospital stay of inpatients and bed days per 1000 inhabitants between 1993 and 1998 for the participating countries. In most countries the number of bed days decreased, especially in the younger age groups. But as previously mentioned this could only be traced back to the reduction of the length of hospital stay, which was influenced by factors other than the health status. Thus, it is doubtful if this trend will continue in the future or if it can be used for a projection.

Table 1.11 Hospital utilisation – Changes between 1993 and 1998 (%)

Age-groups	Hospital admissions per 1000 inhabitants			Length of hospital stay			Bed days per 1000 inhabitants		
	male	female	total	male	female	total	male	female	total
Belgium									
0-4	37.6	51.7	43.7	-2.8	-3.3	-3.0	33.8	46.7	39.5
5-14	-17.0	-10.5	-14.2	-7.1	-1.5	-4.4	-22.9	-11.8	-18.0
15-24	-14.0	-13.3	-13.5	-11.1	-8.3	-9.3	-23.6	-20.5	-21.6
25-34	-4.4	-1.6	-2.2	-13.5	-3.7	-6.2	-17.2	-5.3	-8.3
35-44	-0.4	-3.9	-2.4	-12.9	-6.9	-9.6	-13.3	-10.6	-11.7
45-54	5.5	0.5	3.0	-11.0	-8.5	-9.7	-6.1	-8.0	-7.0
55-64	4.8	9.6	7.1	-13.2	-13.2	-13.2	-9.0	-4.9	-7.1
65-74	10.7	12.0	11.5	-11.7	-13.7	-12.8	-2.3	-3.3	-2.7
75+	1.9	4.9	4.1	-16.9	-16.6	-16.8	-15.3	-12.4	-13.4
Total	7.0	5.0	5.9	-9.5	-8.8	-9.2	-7.8	-5.6	-6.4
Denmark									
0-4	10.0	10.5	10.2	-2.0	-11.0	-5.9	7.9	-1.6	3.7
5-14	-10.9	-7.6	-9.5	-7.1	-8.1	-7.5	-17.2	-15.1	-16.2
15-24	-8.6	-12.6	-11.1	-11.5	-7.0	-8.5	-19.1	-18.6	-18.7
25-34	-8.4	-8.7	-8.4	-12.7	-10.1	-10.7	-20.0	-17.9	-18.2
35-44	-1.6	-1.1	-1.3	-12.3	-13.2	-12.9	-13.7	-14.1	-14.0
45-54	0.6	-7.9	-3.8	-11.5	-7.2	-9.3	-11.0	-14.5	-12.7
55-64	1.5	2.2	2.0	-11.7	-14.0	-12.8	-10.3	-12.1	-11.1
65-74	4.0	4.1	4.2	-12.3	-13.7	-13.1	-8.8	-10.2	-9.4
75+	7.5	5.5	6.4	-16.0	-20.0	-18.7	-9.7	-15.6	-13.5
Total	11.1	3.8	6.9	-14.1	-14.4	-14.3	-9.7	-14.0	-12.2
Finland									
0-14	4.9	7.2	5.9	-11.6	-15.0	-14.3	-7.3	-8.9	-9.2
15-64	7.3	3.5	5.2	-25.7	-25.3	-25.3	-20.3	-22.7	-21.4
65-74	5.3	9.3	8.0	-38.2	-35.6	-36.9	-34.9	-29.6	-31.8
75+	11.4	14.8	13.7	-28.6	-32.4	-31.5	-20.5	-22.5	-22.2
Total	10.2	9.5	9.8	-26.9	-27.0	-27.0	-23.9	-23.6	-23.9
Germany									
0-4	2.8	4.4	3.5	-15.3	-30.4	-22.5	-13.0	-27.3	-19.8
5-14	-4.0	1.1	-1.7	-22.5	-21.6	-22.3	-25.5	-20.7	-23.7
15-24	2.7	0.5	1.5	-23.8	-18.9	-21.1	-21.8	-18.5	-19.9
25-34	3.5	3.5	3.7	-26.7	-17.8	-21.2	-24.1	-14.9	-18.3
35-44	10.4	3.4	6.5	-28.7	-19.4	-23.7	-21.3	-16.6	-18.8
45-54	10.5	5.4	7.9	-27.6	-22.3	-25.3	-20.0	-18.1	-19.4
55-64	17.2	19.3	18.2	-23.7	-26.2	-24.8	-10.6	-11.9	-11.1
65-74	20.7	22.7	22.2	-22.2	-25.1	-24.4	-6.1	-8.1	-6.9
75+	22.9	26.0	25.0	-21.1	-25.7	-24.4	-3.0	-6.4	-5.5
Total	15.7	12.7	14.0	-22.4	-20.6	-21.8	-10.7	-12.2	-11.6
Netherlands									
0-4	5.5	4.7	6.6	-11.4	-13.0	-12.1	-6.5	-8.9	-6.3
5-14	-16.4	-18.2	-14.0	-0.2	-15.1	-7.0	-16.5	-30.5	-20.0
15-24	-11.4	-14.0	-9.8	-12.4	-13.9	-13.4	-22.4	-26.0	-21.9
25-34	-2.5	-18.1	3.4	-10.3	-15.8	-14.9	-12.5	-31.0	-12.0
35-44	-6.8	-11.4	-3.6	-9.4	-13.4	-11.8	-15.6	-23.3	-14.9
45-54	-8.1	-9.1	-7.0	-8.5	-10.8	-9.7	-15.9	-19.0	-16.0
55-64	-7.1	-8.9	-5.1	-11.6	-12.8	-12.2	-17.8	-20.6	-16.6
65-74	-5.2	-6.6	-4.3	-8.6	-10.0	-9.3	-13.3	-15.9	-13.2
75+	-1.9	-2.5	-1.7	-8.4	-8.5	-8.5	-10.1	-10.8	-10.1
Total	-3.2	-5.1	-1.7	-8.3	-10.7	-9.6	-12.6	-14.8	-12.4
Spain <sup>1)</sup>									
0-4	1.0	4.8	2.6	-6.3	-5.1	-5.7	-5.4	-0.6	-3.3
5-14	-9.7	-4.1	-7.4	-11.7	-6.4	-9.4	-20.2	-10.2	-16.1
15-24	-6.3	0.7	-2.6	-11.1	-9.4	-10.7	-16.7	-8.8	-13.0
25-34	-9.9	-2.3	-4.6	-19.7	-11.8	-15.8	-27.7	-13.8	-19.6
35-44	0.5	6.1	3.7	-12.5	-18.5	-15.9	-12.1	-13.5	-12.8
45-54	4.3	-0.4	2.0	-25.4	-21.1	-23.4	-22.2	-21.4	-21.9
55-64	5.4	3.1	4.5	-21.0	-19.1	-20.2	-16.7	-16.6	-16.6
65-74	6.6	5.6	6.3	-20.1	-22.3	-21.1	-14.9	-17.9	-16.1
75+	14.3	15.5	15.2	-19.7	-16.0	-17.6	-8.3	-2.9	-5.1
Total	5.7	6.7	6.2	-16.6	-13.9	-15.3	-13.4	-10.6	-12.0
England									
0-4	-2.0	2.2	-0.1	-14.0	-14.2	-14.0	-15.7	-12.3	-14.1
5-14	-4.3	-1.2	-3.0	-30.5	-34.5	-32.3	-33.5	-35.3	-34.3
15-24	6.0	6.2	6.6	-1.2	-18.0	-11.4	4.8	-12.9	-5.5
25-34	3.9	3.7	4.3	19.6	-8.7	1.5	24.3	-5.3	5.9
35-44	9.9	9.9	10.0	2.3	-9.2	-4.1	12.4	-0.3	5.4
45-54	11.1	10.3	10.7	-9.1	-15.1	-12.2	1.1	-6.4	-2.8
55-64	13.9	21.8	17.6	-17.1	-23.5	-20.2	-5.5	-6.9	-6.2
65-74	13.6	18.9	16.4	-20.1	-21.8	-21.0	-9.3	-7.0	-8.0
75+	10.8	14.5	13.4	-19.6	-18.1	-18.8	-10.9	-6.3	-7.9
Total	8.5	9.0	8.8	-10.0	-14.6	-12.6	-7.1	-7.5	-7.0

1) 1995/1999 in %

Sources: National statistics; calculations by DIW.

In the case of the number of contacts with a doctor, no overall trend could be observed either. In most countries the number of contacts with a doctor increased over time (Table 1.12). Whether health care treatment is provided as an outpatient service or in hospitals depends on the health care system. In several countries general practitioners pose as gatekeepers and specialists are concentrated in hospitals (or health care centres). Otherwise the de-institutionalisation strategy leads to a replacement of treatments from hospitals to outpatient services. Therefore, the increase in contacts with a doctor can partly lead back to latter. It is not possible to forecast further displacements between inpatient and outpatient services. In Germany, for example, combining outpatient and inpatient services is being discussed as a new way of providing health care.

*Table 1.12 Trends in outpatient utilisation*

Countries	Changes in number of contacts with doctors	
	Period	Changes
Belgium	1997-2001	▲
Finland	1987-1996	▲
Germany	1992-1999	▼
Netherlands	1992-2000	▲
Spain	1987-1997	▲
United Kingdom	1988-2000	▲

Source: Schulz 2004 (AGIR WP2 Report).

The use of long-term care services is closely related to age. The prevalence rates for long-term care rise sharply from age 70 onwards. While life expectancy has increased, the prevalence rates for long-term care-giving in institutions have shown no clear trend (Table 1.13). Institutional care is influenced by other pertinent factors, especially political decisions and the availability of places in nursing homes, rather than trends in life expectancy. In several countries waiting lists for nursing homes exist. An overall improvement in health status could lead to better health of the oldest old, but additional functional and mental illness play an important role. It is not clear to what extent better health in the younger ages could reduce functional and mental illness in old ages or could change the prevalence rates for long-term care-giving in institutions. Another point is that long-term care-giving in institutions is the last step in providing care. People in need of long-term care want to live as long as possible in their familiar surroundings. Only if care-giving at home by members of the family or friends is not possible, for example if they live alone, do they consider living in nursing homes. Thus, the expected changes in family structure and household composition also have an important influence on the demand for care-giving in institutions.

*Table 1.13 Trends in long-term care in institutions and at home*

Countries	Care giving in institutions		Care giving at home	
	Changes in prevalence rates			
	Period	Changes	Period	Changes
Belgium	1996-2001	▲	1998-2001	▲
Finland	1995-2001	▲	1995-2001	▲
Germany	1997-2002	▲	1997-2002	→
Netherlands	1996/7-1999/2000	▼		
Denmark	1991-2001	▼	1996-1998	▲

Source: Schulz 2004 (AGIR WP2 Report).

Professional care-giving at home also depends on other factors as well as the acute health status. Informal care-givers need help by professionals if they alone are not able to provide the required care. This is mostly the case if the required intensity of care-giving is high (care-giving night and day) and if the care-giver is also an older person. In the past no general trend in professional long-term care at home has existed in the participating countries, but an increase can generally be observed. Together with the ageing of the population and expected changes in the family and household structures, the demand for long-term care-giving by professional care-givers could increase. But with the existing data it is not possible to estimate to what extent the demand will increase by such changes. Therefore, we can assume that the pressure on professional care-giving will increase, but we cannot quantify this.

To summarise: it is not possible with the existing data to create a coherent set of health-care utilisation scenarios for acute health and long-term care. Thus, the prevalence rates for health care and long-term care utilisation are held constant over the forecast period. This regards the forecasts in chapter 2 as well as the forecasts in chapter 3.

## Chapter 2.

# Impact of Demographic Changes on Acute Health Care and Long-Term Care

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In this chapter estimations of health and long-term care utilisation are made using national sources of utilisation (which cover the whole population) and the two demographic scenarios. The projections show the influence of the demographic development and the impact of additional improvements in life expectancy on the development of health care utilisation. The projections assume that the health status of the population will remain constant. That means that the factors that lead to improvements in health (such as new medical or surgical treatments) and the factors that may have a contrary effect (such as the increase in overweight children) are balanced.

### 2.1 Acute health care

In WP2, data from our participating partners were collected on the admissions into or discharges from a hospital, the length of hospital stay for inpatients and the frequency of contacts with a doctor (general practitioners or medical specialists) based on national sources. This data allows the calculation of age-specific prevalence rates, the average length of hospital stay by age groups and the average number of contacts with a doctor. These utilisation rates for the most recent year are held constant and are combined with the two demographic scenarios.

#### 2.1.1 *Development of hospital cases*

Data regarding hospital utilisation includes acute health care in hospitals and not nursing care for the elderly. Data were collected for hospital admissions (Belgium, Denmark, France and the UK) and for hospital discharges (Finland, Germany, the Netherlands and Spain).

Figure 2.1 shows the number of hospitalised persons (within one year) per 1000 inhabitants by age groups for several participating countries (prevalence rates). The share of hospitalised persons increases with age in all the countries. At a given age, large differences in prevalence rates can be observed between the countries. The prevalence rates are highest in the youngest (0 to 4 years) and oldest (75+) age groups for Denmark and the UK. This is also true for persons aged 25-34 and 35-44. The lowest prevalence rates in the youngest and oldest age groups can be observed for Spain. In general, the prevalence rates for Denmark, Germany and the UK are higher than for Belgium, the Netherlands and Spain.

Keeping the country-specific prevalence rates constant, the development of hospital cases caused by the ageing process can be calculated. Table 2.1 shows the results for the baseline and the living-longer high scenarios.

Figure 2.1 Hospitalised persons per 1000 inhabitants

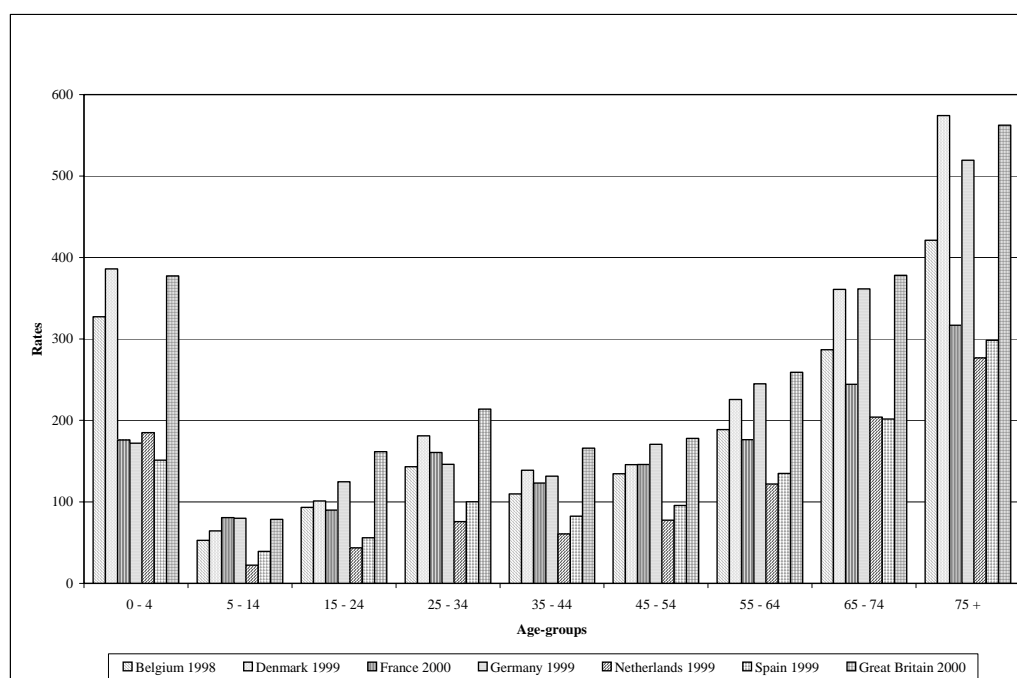


Table 2.1 Development of hospital admissions/discharges (million persons per year)

Countries	1999*)	2010	2020	2030	2040	2050
Baseline scenario						
Belgium	1,72	1,82	1,92	2,02	2,05	1,99
Denmark	1,10	1,14	1,23	1,31	1,32	1,32
Finland	1,38	1,50	1,64	1,79	1,77	1,70
France	9,20	9,77	10,31	10,81	11,00	10,81
Germany	16,20	17,42	18,37	18,87	19,07	18,24
Netherlands	1,52	1,69	1,87	2,00	2,03	1,99
Spain	4,50	4,79	4,91	5,11	5,26	5,11
United Kingdom	11,33	11,73	12,54	13,21	13,56	13,53
Total	46,95	49,85	52,78	55,12	56,04	54,67
Living-longer-high scenario						
Belgium	1,72	1,83	1,97	2,11	2,21	2,21
Denmark	1,10	1,15	1,27	1,39	1,45	1,50
Finland	1,38	1,51	1,70	1,91	1,97	1,94
France	9,20	9,84	10,51	11,21	11,66	11,71
Germany	16,20	17,60	18,93	19,91	20,71	20,61
Netherlands	1,52	1,71	1,92	2,11	2,21	2,25
Spain	4,50	4,84	5,05	5,38	5,71	5,79
United Kingdom	11,33	11,84	12,87	13,88	14,68	15,17
Total	46,95	50,33	54,22	57,89	60,59	61,17

\*) France and United Kingdom = 2000.

Source: Calculations by DIW.



In the participating countries altogether, approximately 47 million persons were hospitalised at least once in 1999. This number will increase to 56 million in 2040 and is expected to decrease to 55 million by 2050 (baseline scenario). In the living-longer high scenario the number of hospitalised people is around 6.5 million higher in 2050.

The development of the number of hospitalised persons is different among the participating countries (Figure 2.2 and Table A5). The highest increase can be observed for the Netherlands (an increase of 32% by 2050 in the baseline scenario) and the lowest for Germany and Spain (around 13% by 2050). Additional improvements in life expectancy lead to a higher growth rate of hospital cases. In the participating countries combined the increase will be 30% by 2050, which is around 14 percentage points more than in the baseline scenario.

Table 2.2. Hospital cases by age group (million persons)

Countries	Baseline scenario					Living-longer-high scenario				
	Age-groups									
	0 - 14	15 - 64	65 - 74	75+	Total	0 - 14	15 - 64	65 - 74	75+	Total
1999 <sup>*)</sup>										
Belgium	0,2	0,9	0,3	0,3	1,7	0,2	0,9	0,3	0,3	1,7
Denmark	0,2	0,6	0,1	0,2	1,1	0,2	0,6	0,1	0,2	1,1
Finland	0,1	0,7	0,2	0,3	1,4	0,1	0,7	0,2	0,3	1,4
France	1,2	5,3	1,3	1,4	9,2	1,2	5,3	1,3	1,4	9,2
Germany	1,4	9,1	2,7	3,0	16,2	1,4	9,1	2,7	3,0	16,2
Netherlands	0,2	0,8	0,2	0,3	1,5	0,2	0,8	0,2	0,3	1,5
Spain	0,4	2,5	0,8	0,8	4,5	0,4	2,5	0,8	0,8	4,5
United Kingdom	1,7	6,1	1,5	2,0	11,3	1,7	6,1	1,5	2,0	11,3
Total	5,5	26,0	7,2	8,3	46,9	5,5	26,0	7,2	8,3	46,9
2020										
Belgium	0,2	0,9	0,4	0,4	1,9	0,2	0,9	0,4	0,5	2,0
Denmark	0,2	0,6	0,2	0,3	1,2	0,2	0,6	0,2	0,3	1,3
Finland	0,1	0,7	0,4	0,5	1,6	0,1	0,7	0,4	0,6	1,7
France	1,2	5,5	1,8	1,8	10,3	1,2	5,5	1,8	2,0	10,5
Germany	1,2	9,1	3,3	4,7	18,4	1,2	9,1	3,4	5,2	18,9
Netherlands	0,2	0,9	0,4	0,4	1,9	0,2	0,9	0,4	0,4	1,9
Spain	0,4	2,5	0,8	1,2	4,9	0,4	2,5	0,9	1,3	5,1
United Kingdom	1,5	6,5	2,1	2,4	12,5	1,5	6,5	2,1	2,7	12,9
Total	5,0	26,6	9,4	11,8	52,8	5,0	26,7	9,6	12,9	54,2
2050										
Belgium	0,2	0,8	0,3	0,6	2,0	0,2	0,8	0,3	0,8	2,2
Denmark	0,2	0,5	0,2	0,4	1,3	0,2	0,5	0,2	0,6	1,5
Finland	0,1	0,6	0,3	0,7	1,7	0,1	0,6	0,3	0,9	1,9
France	1,1	5,0	1,7	3,0	10,8	1,1	5,1	1,8	3,8	11,7
Germany	1,1	7,4	3,3	6,5	18,2	1,1	7,5	3,5	8,6	20,6
Netherlands	0,2	0,8	0,4	0,6	2,0	0,2	0,8	0,4	0,8	2,2
Spain	0,3	1,8	1,0	2,0	5,1	0,3	1,8	1,1	2,6	5,8
United Kingdom	1,4	5,9	2,1	4,1	13,5	1,4	6,0	2,2	5,5	15,2
Total	4,6	22,9	9,3	17,9	54,7	4,6	23,1	9,9	23,6	61,2

\*) France and United Kingdom = 2000.

Source: Calculations by DIW.

Figure 2.2 Development of hospital cases in participating countries

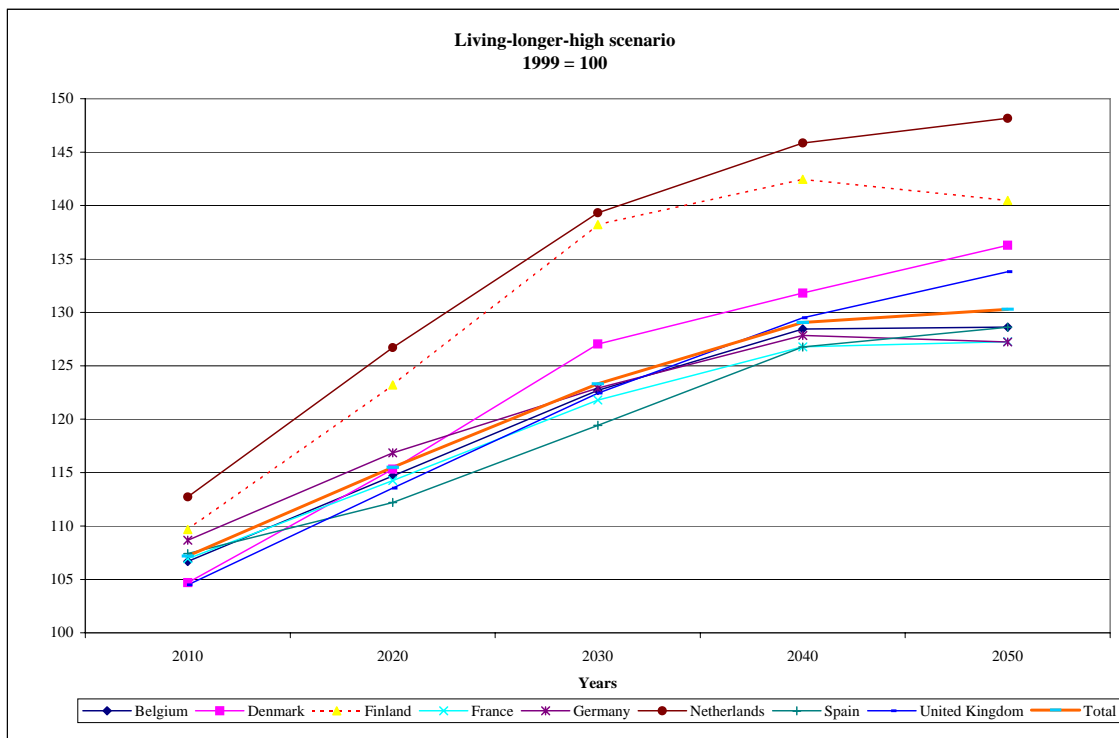
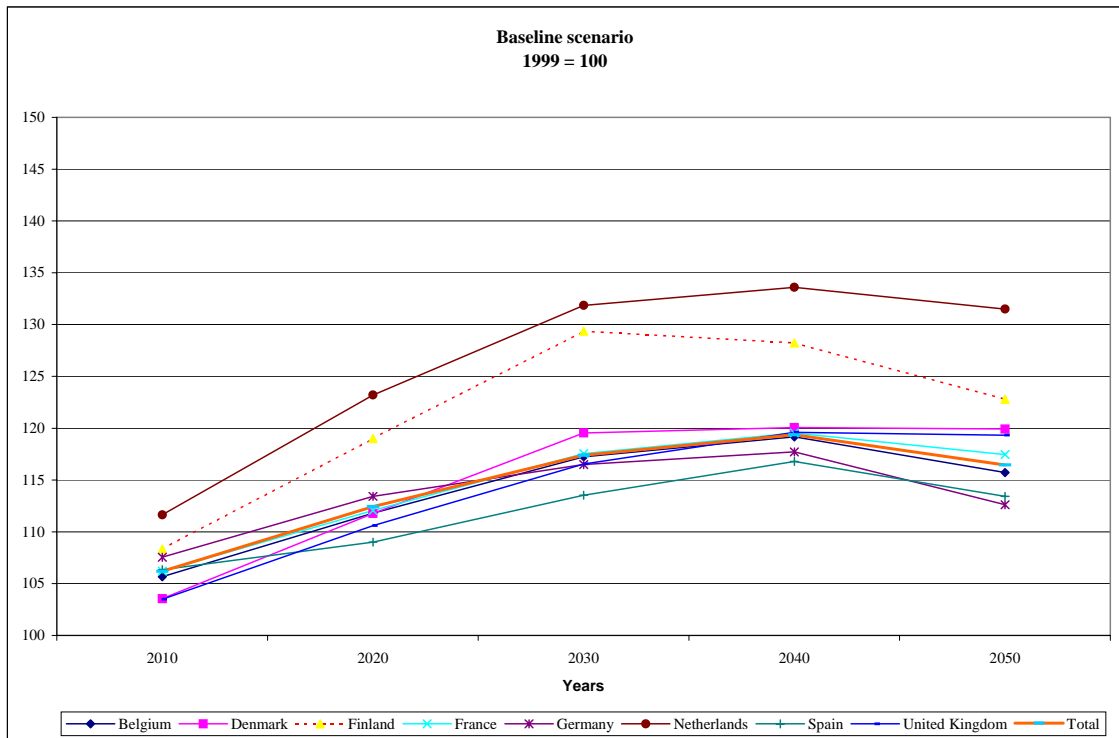
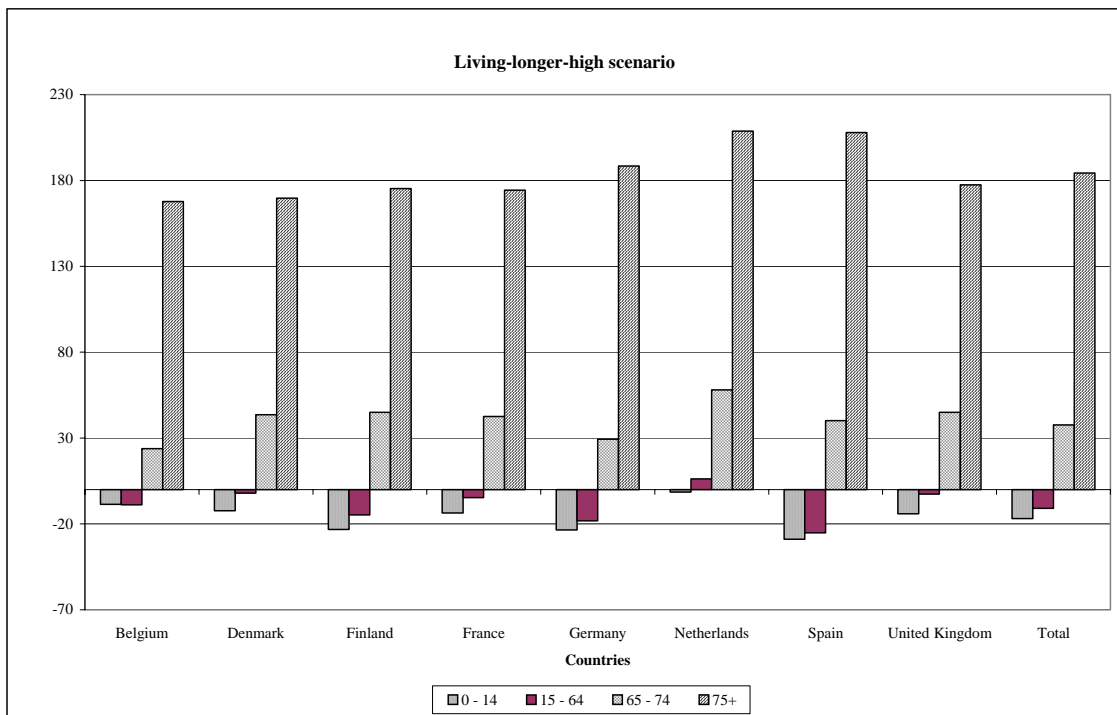
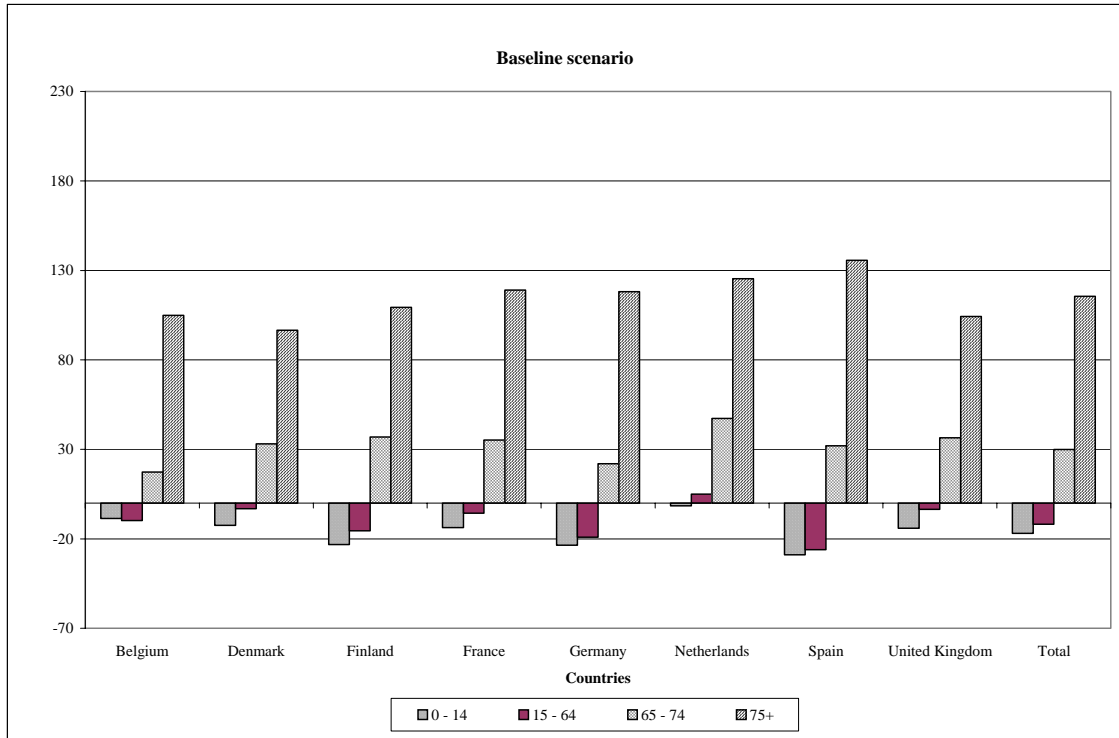


Figure 2.3 Changes in the number of hospital cases within the age groups between 1999 and 2050 (%)



This moderate increase in hospital admissions in the baseline scenario is the result of contrary developments in the younger and older age groups. The ageing process leads to increasing hospital admissions at older ages, but to decreasing hospital admissions in the younger and middle age groups. The number of hospitalised people aged 75+ will rise from 8.3 million in 1999 to 17.9 million in the baseline scenario and to 23.6 million in the living-longer high scenario in 2050 (Tables 2.2 and A6). That is an increase of 115% (baseline scenario) and 184% (living-longer high scenario). In the age group 65-74, the increment is 30% (baseline scenario) and 38% (living-longer high scenario) (Figure 2.3 and Table A7). In the age groups 0-14 and 15-64, the hospital admissions decline by 4 million, at 17% (0-14) and 12% (15-64) in the baseline scenario. In the living-longer high scenario an additional reduction in mortality rates for people aged 20+ is assumed. Therefore, the decline in the youngest age group will be the same as in the baseline scenario and in the age group 15-64 it will be a little bit lower, specifically 11%.

The ageing process will lead to changes in the age structure of inpatients. In the participating countries altogether approximately 18% of inpatients were aged 75+ in 1999. By 2050, one in three inpatients will be aged 75+ (Figure 2.4 and Tables A8 and A9) and one in two inpatients will be aged 65+ (baseline scenario). In the living-longer scenario, the proportion of patients aged 75+ will be nearly 40% in 2050.

The projected proportion of patients aged 75+ is highest in Finland (41% in the baseline and 47% in the living-longer scenario) followed by Spain (38% and 44% respectively) in 2050. The change in percentage points is greatest for Spain (20 percentage points and 26 percentage points respectively).

### 2.1.2 *Development of bed days*

Hospital utilisation and the expenditure on hospital care depend on the number of hospitalised persons as well as on the length of hospital stay. Figure 2.5 shows the length of hospital stays by age group in the participating countries (with the exception of Finland, which provided alternative age groups). The length of a hospital stay increases with age in all countries. On average, the length of a hospital stay is highest for Germany and lowest for the UK for nearly every age group. The length of a hospital stay has decreased in all age groups in the past. But this is not mainly the result of a better health status of the population. This trend is caused by new medical treatments, for example the increasing use of minimal invasive surgery and the de-institutionalisation strategy of health policies. Full inpatient care is being substituted by outpatient care or by day care. This means that not only health expenditures but also health care utilisation is influenced by other factors besides demography and health status.

Therefore, the average length of a hospital stay for 1999 (for France and the UK in 2000) is held constant over the forecasting period. The total number of days spent in a hospital (bed days or hospital days are used here interchangeably) is the result of hospital cases multiplied with the average length of hospital stay in the single age group.

Figure 2.4 Age structure of hospital cases

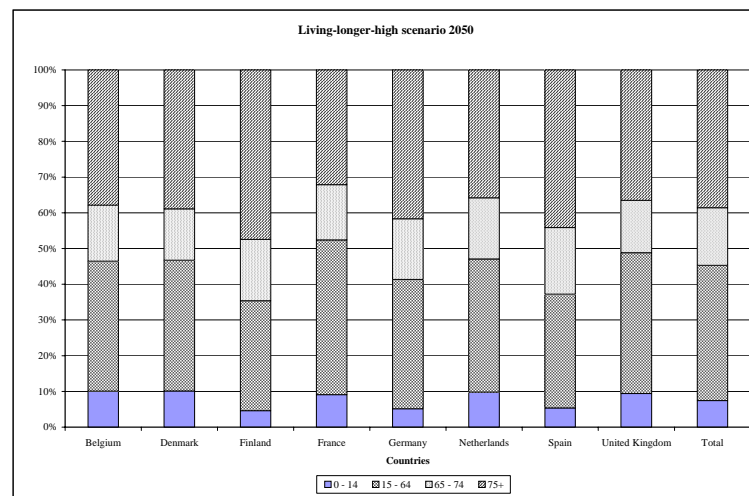
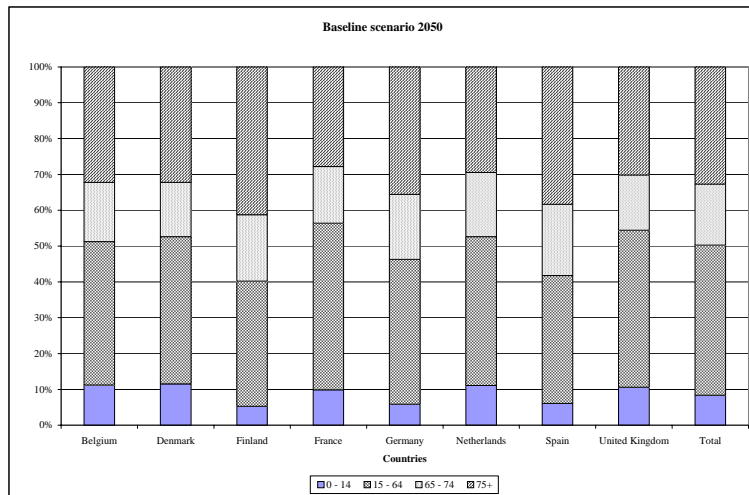
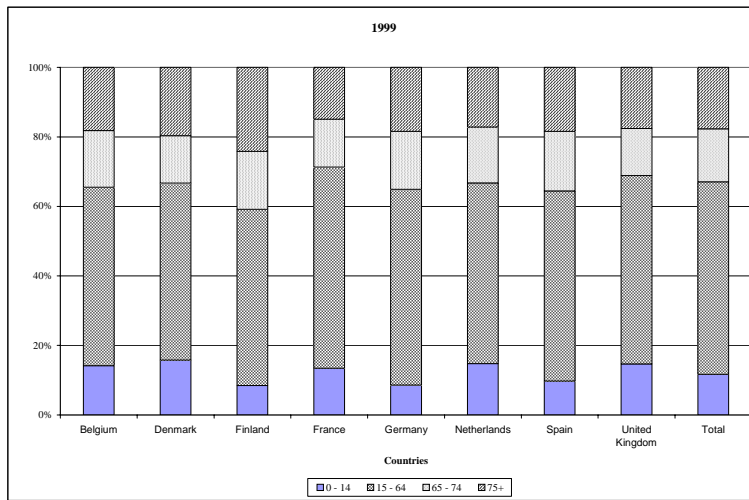


Figure 2.5 Length of hospital stay (1999)

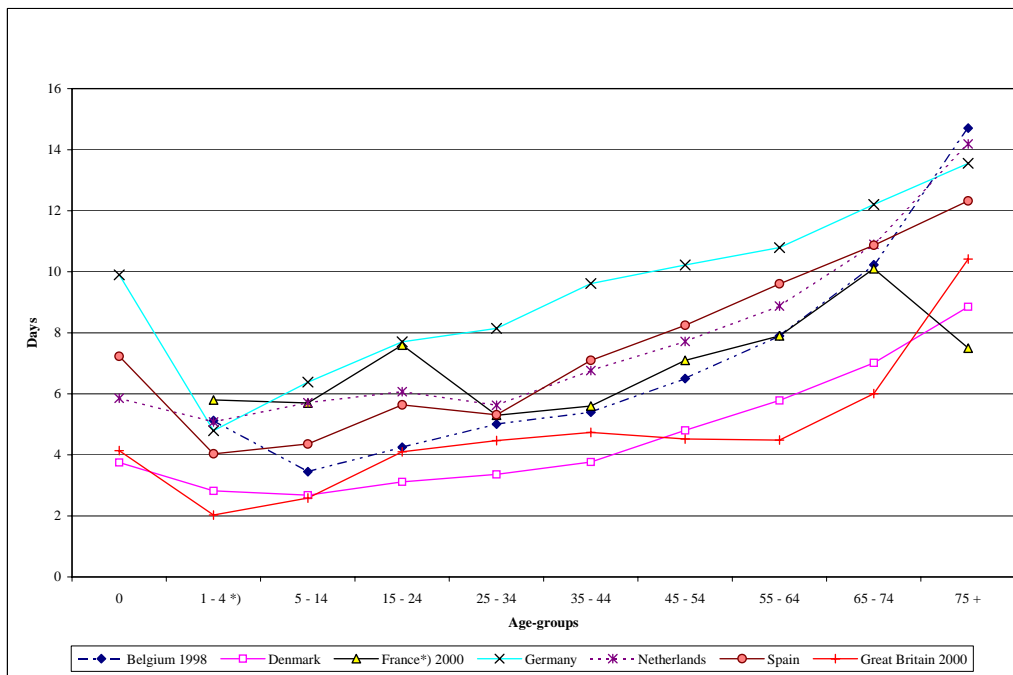


Table 2.3 Development of hospital days (million days)

Countries	1999*)	2010	2020	2030	2040	2050
Baseline scenario						
Belgium	13,9	15,3	16,6	18,4	19,4	18,7
Denmark	5,9	6,3	7,1	7,8	8,0	8,0
Finland	14,6	16,7	19,4	23,4	23,9	22,6
France	65,1	69,7	75,5	79,7	81,1	79,6
Germany	169,8	187,3	201,1	209,9	215,7	206,7
Netherlands	13,2	15,4	17,5	19,4	20,1	19,7
Spain	38,6	42,6	45,2	48,4	51,3	51,0
United Kingdom	59,4	62,5	68,4	75,8	81,9	84,4
Total	380,5	415,8	450,7	482,7	501,4	490,6
Living-longer-high scenario						
Belgium	13,9	15,5	17,3	19,7	21,6	21,9
Denmark	5,9	6,4	7,4	8,4	9,0	9,4
Finland	14,6	17,1	20,5	25,9	28,0	27,6
France	65,1	70,2	77,1	82,7	86,3	86,6
Germany	169,8	189,6	208,4	223,6	237,5	238,3
Netherlands	13,2	15,6	18,2	20,9	22,7	23,4
Spain	38,6	43,2	47,0	51,7	56,9	59,6
United Kingdom	59,4	63,6	71,7	82,7	94,1	102,8
Total	380,5	421,3	467,7	515,7	556,0	569,5

\*) France and United Kingdom = 2000.  
Source: Calculations by DIW.

Table 2.3 shows the development of total hospital days for the participating countries. In the participating countries altogether, people spent 380 million days in a hospital in 1999. By 2040 the number of hospital days will increase to 501 million in the baseline scenario and to 556 million in the living-longer high scenario. After 2040 a slight decline is expected, reducing the figures down to 491 million days in the baseline scenario. In the living-longer high scenario a further increase up to 570 million days in 2050 is expected. The rise in the number of hospital days is highest for Finland (an increase of 55% in the baseline and 90% in the living-longer high scenario by 2050) and lowest for Germany and France (Figure 2.6). On average, the increase in the living-longer high scenario is 21 percentage points higher compared with the baseline scenario (which is an increase of 71%).

As in the case of hospital admissions, the length of hospital stays increases with age. Therefore, the observed trend in hospital admissions within the age groups will be strengthened. In the oldest age group (75+) the number of days spent in a hospital will more than double in the baseline scenario and nearly triple in the living-longer high scenario (Table 2.4 and Figure 2.7 and Tables A10-A12). The population development will lead to massive displacements in the age structure of hospital days in all participating countries (Figure 2.8 and Tables A13-A14). In the participating countries altogether around a quarter of the hospital days were used by inpatients aged 75+ in 1999. By 2050, 44% (baseline scenario) and 50% (living-longer high scenario) of the total hospital days will be utilised by this age group. Whereas the share of days of the old inpatients is expected to rise, the share of days of the younger-old inpatients (65-74 years) will be nearly constant and the share of the younger and middle-aged patients will decline by 2050.

*To summarise:* The ageing population in most participating countries will lead to a moderate increase in the number of hospital admissions. This is caused by the contrary developments in the younger and older age groups. By 2050, approximately half of the hospital days will be required for persons aged 75+. The spectrum of diseases of the elderly is different from that of the younger inpatients, and thus the elderly require a different spectrum of hospital treatments. Except for acute illness, old people mostly suffer from functional disability and mental illness. Thus, the significant structural change requires substantial reorganisation and restructuring of hospital departments. Government officials and hospital administrators should take into account this information in the strategic planning of hospital services as well as in the training of medical and nursing staff.

### 2.1.3 *Hospital utilisation and the nearness to mortality – the example of Germany*

Another intensively discussed question is whether age is the driver of health utilisation and health care expenditure or the nearness to mortality. Studies have shown that the intensity of health care utilisation is much higher for decedents than for survivors, with the ratio of health care expenditures of decedents to survivors being higher in the younger and the middle ages than among the elderly (Busse et al., 2002). Several studies have focused on the health care expenditure related to mortality (Lubitz & Riley, 1993).

Figure 2.6 Development of the number of hospital days

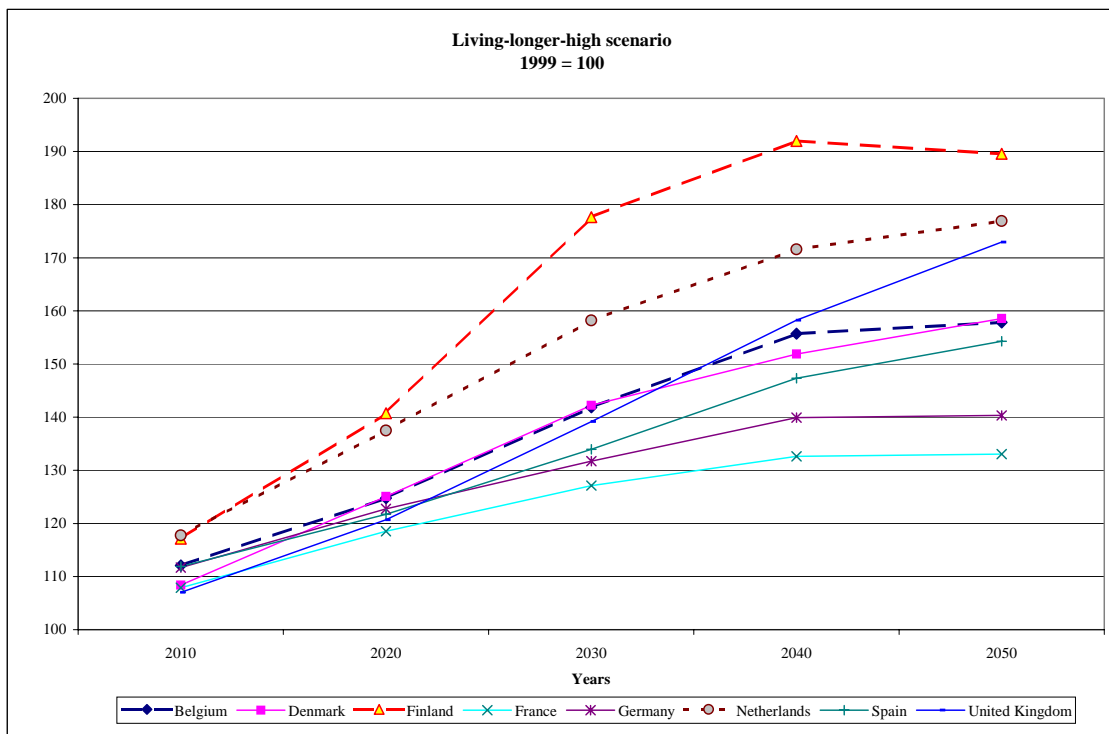
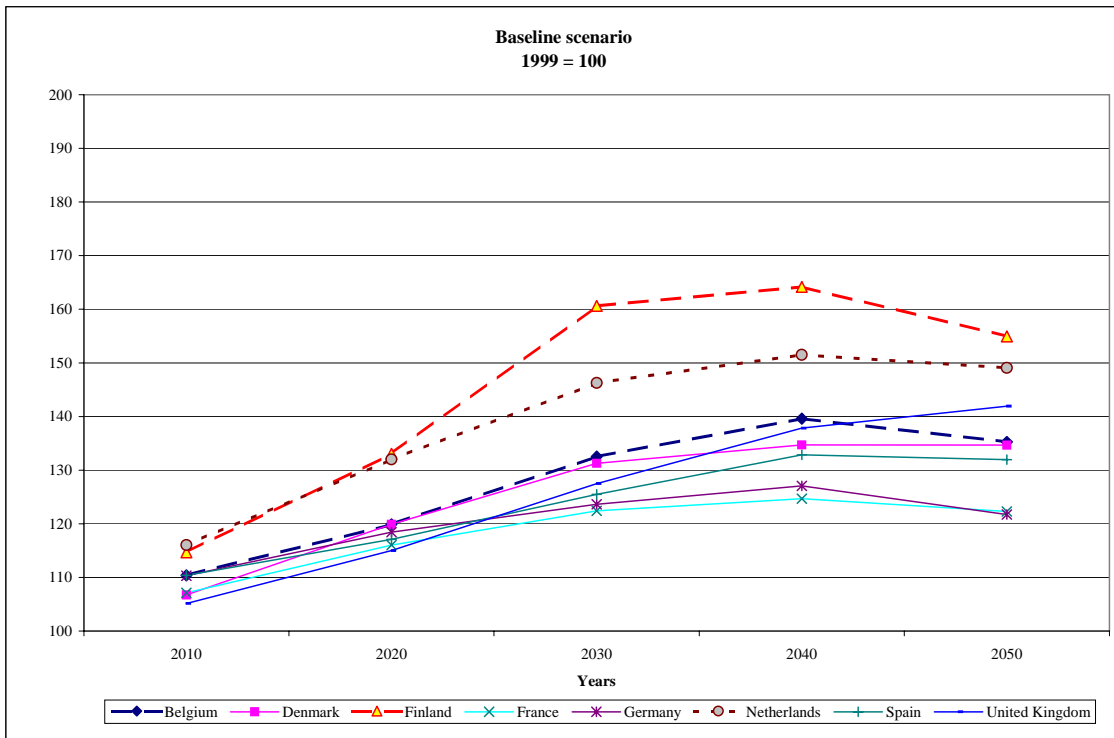




Table 2.4 Number of hospital days by age group (1999 = 100)

Countries	Baseline scenario					Living-longer-high scenario				
	Age-groups									
	0 - 14	15 - 64	65 - 74	75+	Total	0 - 14	15 - 64	65 - 74	75+	Total
2020										
Belgium	98	108	126	136	120	98	108	128	148	125
Denmark	89	106	148	131	120	89	106	153	144	125
Finland	88	95	161	151	133	88	95	165	165	141
France	94	106	141	134	116	94	107	144	145	119
Germany	89	101	123	159	118	89	102	126	174	123
Netherlands	97	114	162	150	132	97	115	166	165	137
Spain	85	109	110	145	117	85	109	113	159	122
United Kingdom	93	106	136	122	115	93	106	139	137	121
Total	91	104	129	145	118	91	104	132	159	123
2050										
Belgium	93	93	117	205	135	93	94	124	268	158
Denmark	88	100	132	193	135	88	101	143	260	159
Finland	77	85	137	209	155	77	85	145	275	190
France	86	96	135	219	122	86	97	142	274	133
Germany	77	82	122	218	122	77	83	129	288	140
Netherlands	98	108	148	230	149	98	110	158	320	177
Spain	71	79	132	238	132	71	80	140	314	154
United Kingdom	86	97	136	214	142	86	98	145	300	173
Total	82	88	129	218	129	82	89	136	291	150
*) France and United Kingdom = 2000.										
Source: Calculations by DIW.										

The studies have pointed out that the costs of acute care rise with age, but that the proximity to mortality is a more important factor in determining the costs (McGrail et al., 2000; Felder et al., 2000; Scitovsky, 1994; Serup-Hansen et al., 2002). One study concluded that health care expenditure depends on the remaining lifespan but not on calendar age per se (Zweifel et al., 1999; Salas & Raftery, 2001; Zweifel et al., 2001; Getzen, 2001).

One aim of WP4 is to make forecasts of hospital utilisation with utilisation rates subdivided by survivors and decedents. But data could only be collected for Germany. For Germany, Busse et al. (2002) presented data on hospital utilisation decomposed by age group, survivors and decedents in their last, second and third year of life before mortality. Their data source was a 10% random sample of the insured persons of one German sickness fund with data on approximately 70,000 survivors and 1,400 decedents between November 1991 and November 1995. Figure 2.9 shows the results. Decedents in their last year of life spent markedly more days in a hospital than survivors in a given age group. Based on these data, projections for Germany were made.

Figure 2.7 Changes in the number of bed days within the age groups between 1999 and 2050 (%)

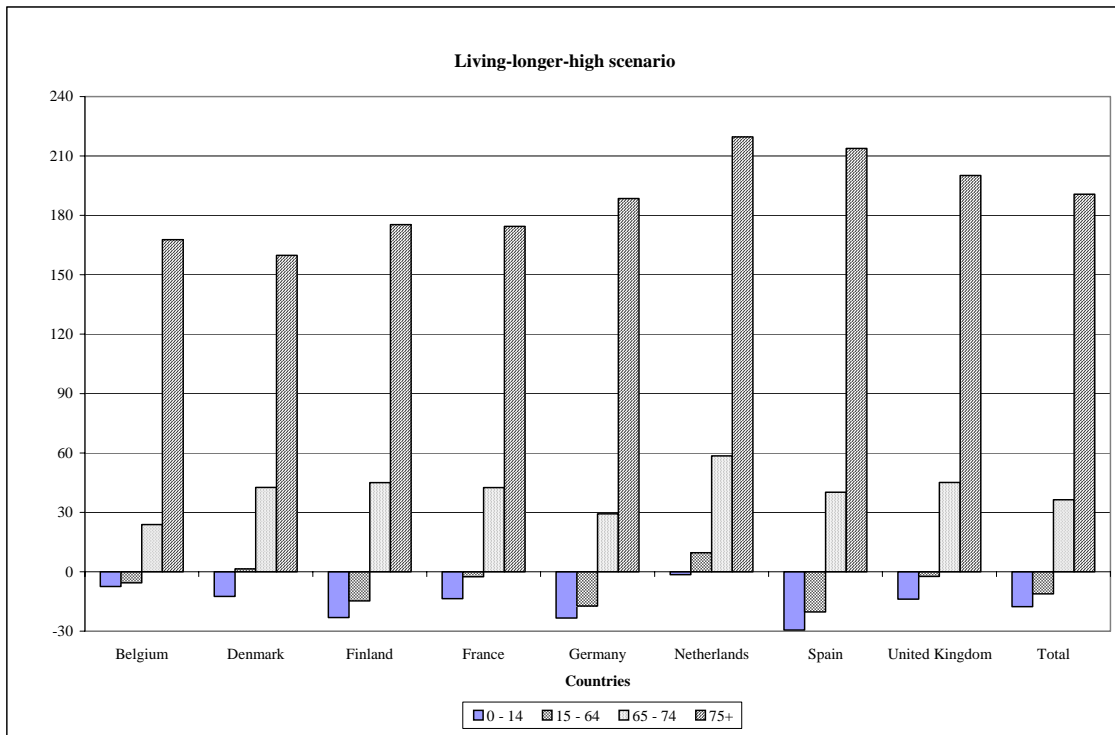
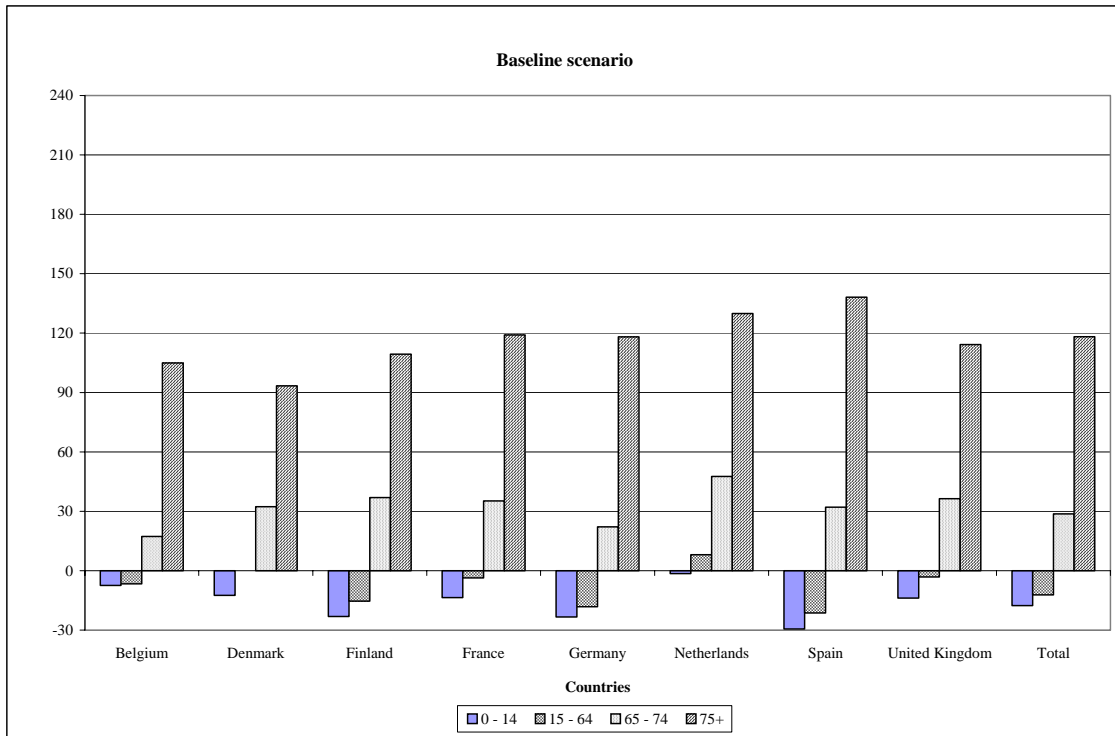


Figure 2.8 Age structure of hospital days

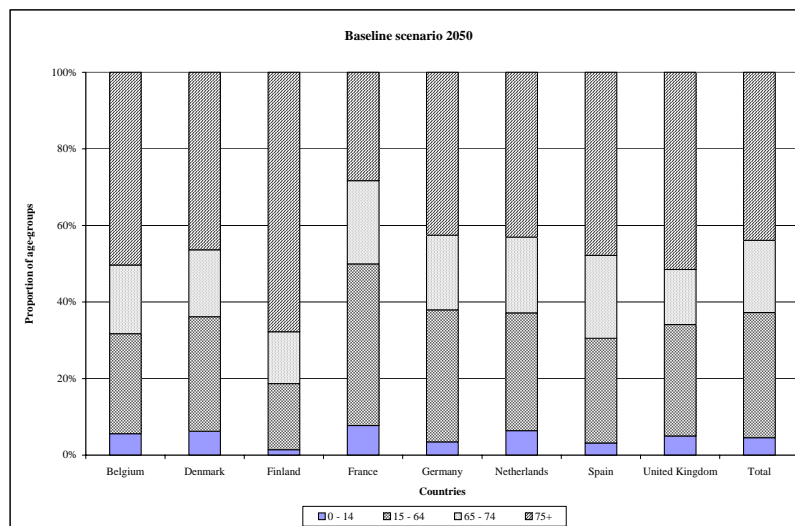
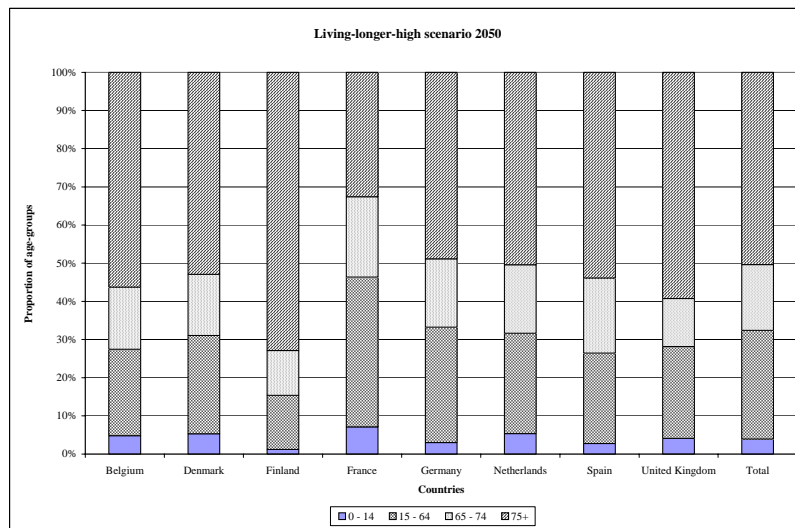
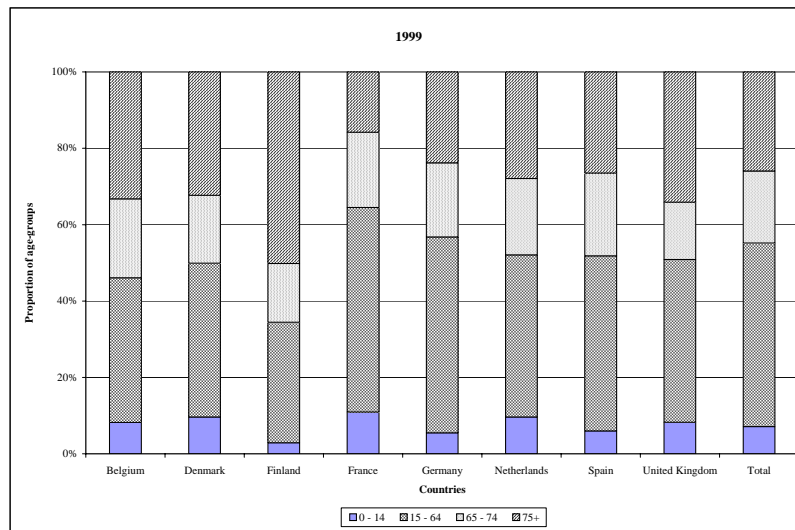
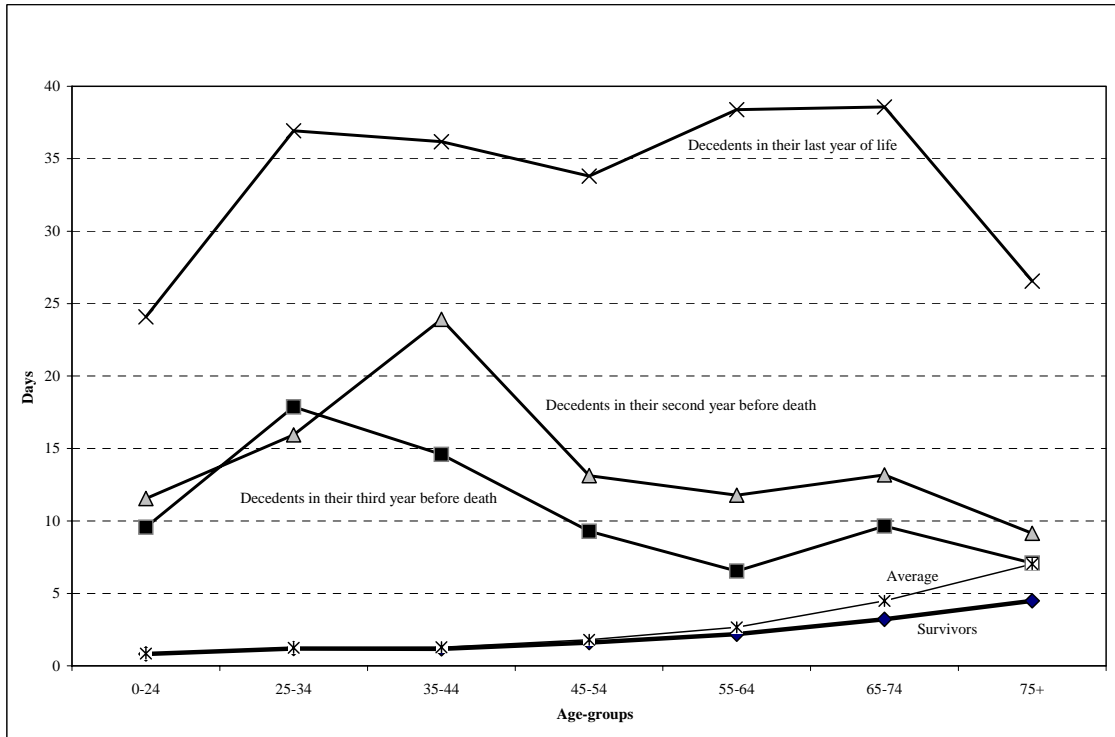


Figure 2.9 Days spent in a hospital within one year by decedents and survivors in Germany (1999)



Schulz et al. (2004) made a population forecast decomposed by survivors, decedents in the last, the second to last, and the third to last year before mortality and combined the results with a) age- and gender-specific average prevalence rates and with b) the utilisation data decomposed by decedents and survivors from Busse et al. (2002). The two estimations were compared to show the effects of 'nearness to mortality'. The decomposition by survivors and decedents leads to a more moderate increase of hospital days (Table 2.5). While the estimation with average utilisation rates leads to an increase up to 231 million hospital days in 2050, the decomposition leads to an increase of up to 212 million days. A look at the changes in percentages shows a clear distinction: an increase of 34% in the case of average utilisation rates and an increase of 24% in the case of decomposed utilisation rates.

Table 2.5 Development of hospital days in Germany

Age-groups	Projection method A <sup>1)</sup>				Projection method B <sup>2)</sup>			
	Not taking into account the nearness to death				Taking into account the nearness to death			
	1998	2020	2050	2050/1998	1998	2020	2050	2050/1998
	in million days			in %	in million days			in %
0-24	18,7	15,3	11,7	-37,6	18,7	14,9	11,4	-39,0
25-34	15,9	11,7	8,6	-45,5	15,9	11,9	8,8	-44,7
35-44	16,8	13,0	9,9	-41,1	16,8	12,6	9,5	-43,3
45-54	18,2	21,5	15,6	-14,3	18,2	20,9	14,9	-18,4
55-64	29,3	35,6	27,6	-5,9	29,3	33,2	24,8	-15,3
65-74	33,1	42,7	44,7	35,0	33,1	39,2	39,0	17,7
75+	39,9	70,5	112,8	182,8	39,9	65,2	104,0	160,5
Total <sup>*)</sup>	171,9	210,4	231,0	34,4	171,9	198,0	212,4	23,5

1) Projection method A: Projection by age-groups, gender and diagnosis (ICD9).-

2) Projection method B: Projection by age-groups, decomposed by survivors and decedents in their last, second and third year before death.

Source: Schulz, Leidl, König 2004.

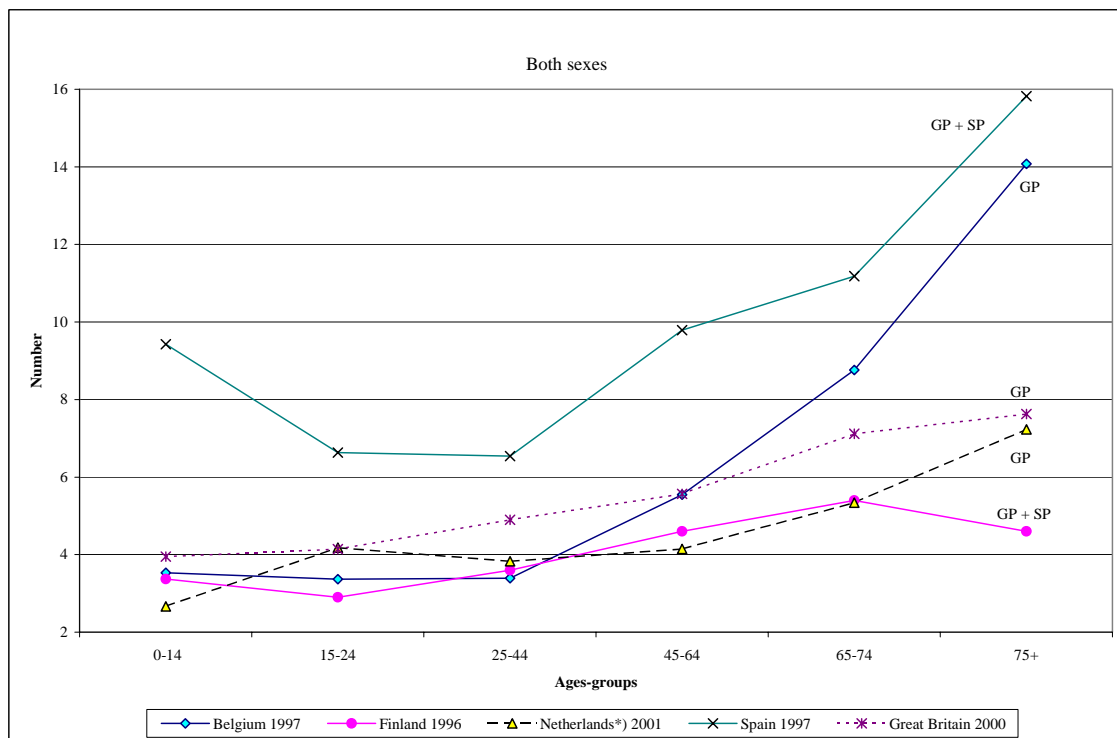
#### 2.1.4 Outpatient care

National sources for outpatient utilisation are mainly surveys: health surveys as well as general household surveys. Some participants – the UK, Belgium and the Netherlands – provided data about contact with a general practitioner (GP); Finland and Spain provided data about the contact with doctors (GPs and specialists). Germany and France provided data on the share of people having had contact with a doctor and no data exists for Denmark. The data provided from Germany and France are not compatible with the data from the other participants. Thus, the forecast for the development of the number of contacts with a doctor includes only five countries (Belgium, Finland, the Netherlands, Spain and the UK).

The analyses in WP2 based on data from the European Community Household Panel (ECHP) show that people visit a general practitioner more often than a specialist (Schulz, 2004). On average the number of contacts with a specialist was around half of the amount for practitioners. This can be traced back to the institutional setting of the health care systems. In the UK and in the Netherlands, for example, specialists are concentrated in hospitals. In Finland, Belgium and Spain most of the specialist work is in hospital outpatient departments and in Spain and Finland patients need a referral from a general practitioner to visit a specialist. The latter is also true for Denmark. In Belgium there are incentives to go first to a general practitioner before consulting a specialist (the practitioner serves as a gatekeeper to save contributions to the health insurance schemes). In Germany and France ambulatory care by self-employed specialists and a free choice of services exist. Such differences have to be kept in mind in the interpretation of the results presented here. The estimation is made in the underlying current health care system and no changes in the framework conditions are supposed.

Figure 2.10 shows the average number of contacts with doctors by age group for Belgium, Finland, the Netherlands, Spain and the UK within one year. The average number of contacts is highest in the youngest and oldest age groups and lowest for the age group 15-24. Generally, the number of contacts is lower in Finland than in the other countries, but the data from Finland are from 1996.

*Figure 2.10 Average number of contacts with a general practitioner (GP) and a specialist (SP) within one year*



For Belgium, Finland, the Netherlands, Spain and the UK combined, around 797 million contacts with a doctor can be observed in 2001. The number of contacts is expected to rise to 869 million by 2040 and thereafter decline to 845 million in the baseline scenario (Table 2.6). This is a moderate increase of 6%. In the living-longer high scenario the development is expected to be more dynamic. The number of contacts with a doctor increases up to 922 million in 2040 and after this will be nearly constant at 920 million until 2050. Thus, the expected increase by 2050 is 15%. The highest rise in outpatient utilisation is expected for the Netherlands and for Belgium, whereas in Spain the number of contacts will be the same in 2050 as in 2001, and in Finland the number of contacts will be less than in 2001 in the baseline scenario (Figure 2.11 and Table A15). In the living-longer high scenario the number of contacts with a doctor is expected to increase in all countries, with the highest increase in Belgium.

*Table 2.6 Development of contacts with a doctor within one year (millions)*

Countries	2001	2010	2020	2030	2040	2050
Baseline scenario						
Belgium <sup>1)</sup> (GP)	53,7	56,6	59,3	62,7	64,0	61,8
Finland <sup>2)</sup> (GP+SP)	20,6	21,2	21,7	21,6	20,9	20,2
Netherlands (GP)	64,1	68,2	71,9	74,7	75,6	74,9
Spain <sup>1)</sup> (GP+SP)	350,1	363,0	368,6	369,7	366,4	351,2
United Kingdom <sup>3)</sup> (GP)	308,9	318,3	330,6	340,6	342,6	336,5
Total	797,4	827,2	852,2	869,3	869,5	844,7
Living-longer-high scenario						
Belgium <sup>1)</sup> (GP)	53,8	57,1	61,0	65,7	69,2	69,1
Finland <sup>2)</sup> (GP+SP)	20,6	21,3	22,0	22,3	22,0	21,5
Netherlands (GP)	64,1	68,7	73,3	77,6	80,4	81,6
Spain <sup>1)</sup> (GP+SP)	350,2	365,5	376,1	383,5	389,4	385,7
United Kingdom <sup>3)</sup> (GP)	309,1	320,3	336,4	351,9	360,8	362,4
Total	797,7	832,9	868,8	901,1	921,9	920,2
Average population based on: 1) 1997, 2) 1996, 3) 2000.						
GP = General practitioner; SP = Specialist.						
Source: Calculations by DIW.						

The development of contacts with a doctor appears to be more dynamic when examining separate age groups. As in the case of hospital days, contacts with a doctor will decline in the younger (0-14) and middle (15-64) age groups, while in the older age groups a marked growth is expected. The number of contacts with a doctor for people aged 75+ will double and for people aged 65-74 the expected increase is 34% in the baseline scenario (Figure 2.12 and Tables A16-A18). In the living-longer high scenario the number of contacts with a doctor for people aged 75+ is expected to increase by 170% (nearly triple) and for people aged 65-74 the expected increase is 42%. Among the countries the changes within the age groups are different. In the Netherlands, practically no change in the number of contacts for people aged less than 65 is expected, whereas in Spain a decrease in the number of contacts by one-quarter is estimated for this age group.

Thus, the age structure of contacts with a doctor will change. In the five countries altogether 13% of contacts were used by people aged 75+ in 2001 (Table 2.7). For the baseline scenario (and living-longer high scenario) the share of this age group is expected to be 25% (30%) in 2050, with the highest share of 34% (40%) in Belgium and the lowest share of 16% (19%) in Finland. The change in the age structure of contacts with a doctor in percentage points between 2001 and 2050 is highest for Spain and Belgium and lowest for Finland and the UK (Table A19).

Figure 2.11 Development of the number of contacts with a doctor

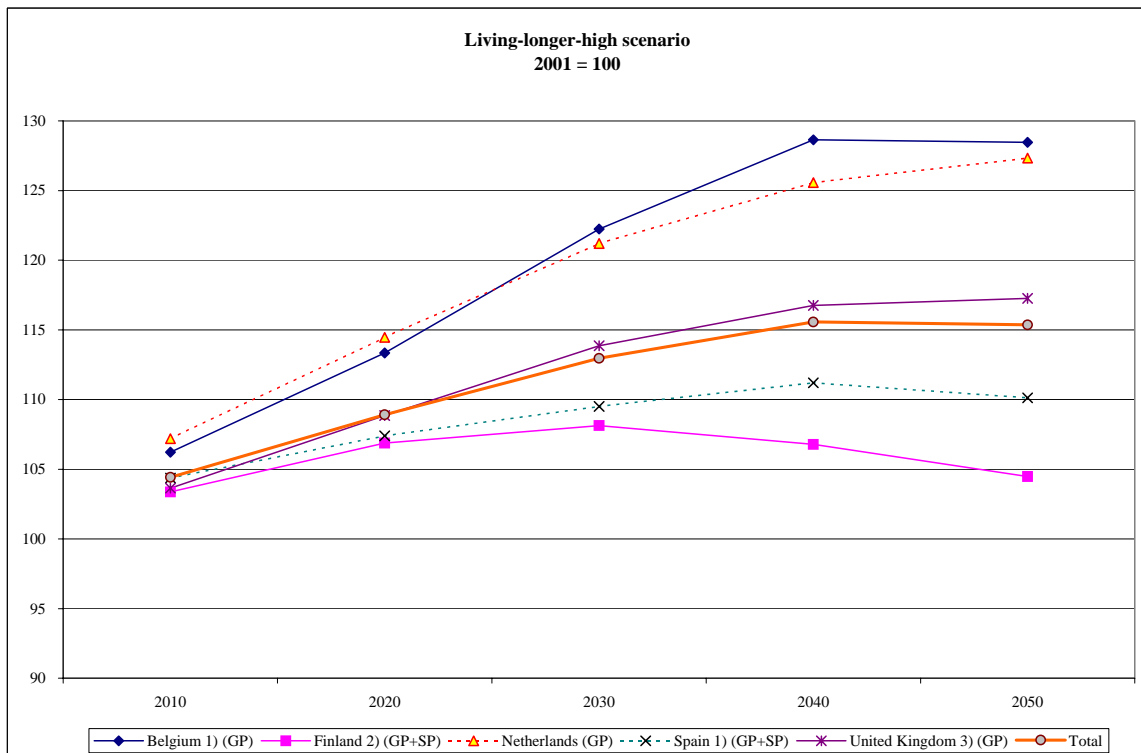
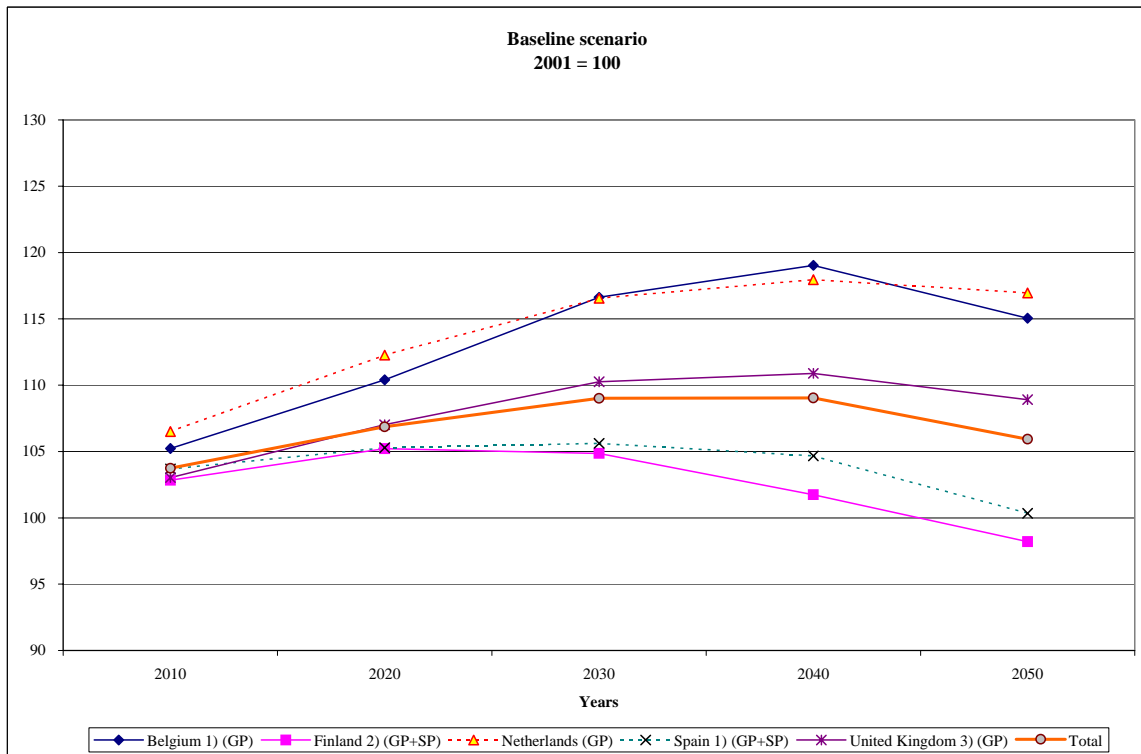




Figure 2.12 Changes in the number of contacts with a doctor within the age groups between 2001 and 2050 (%)

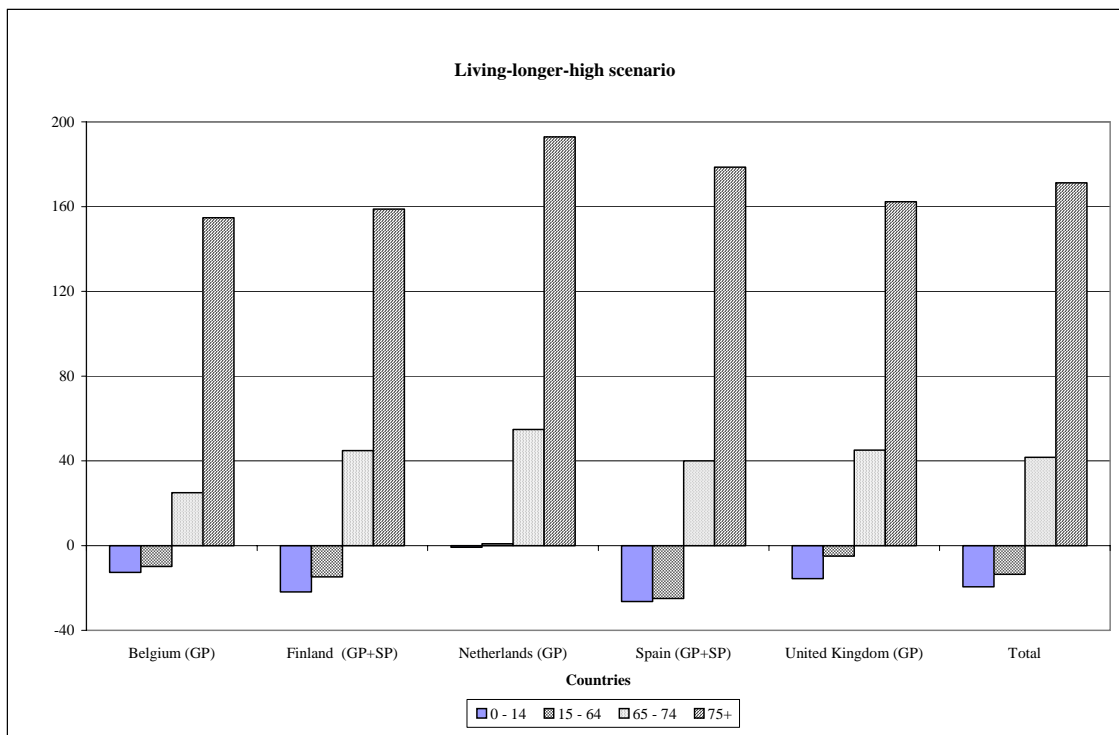
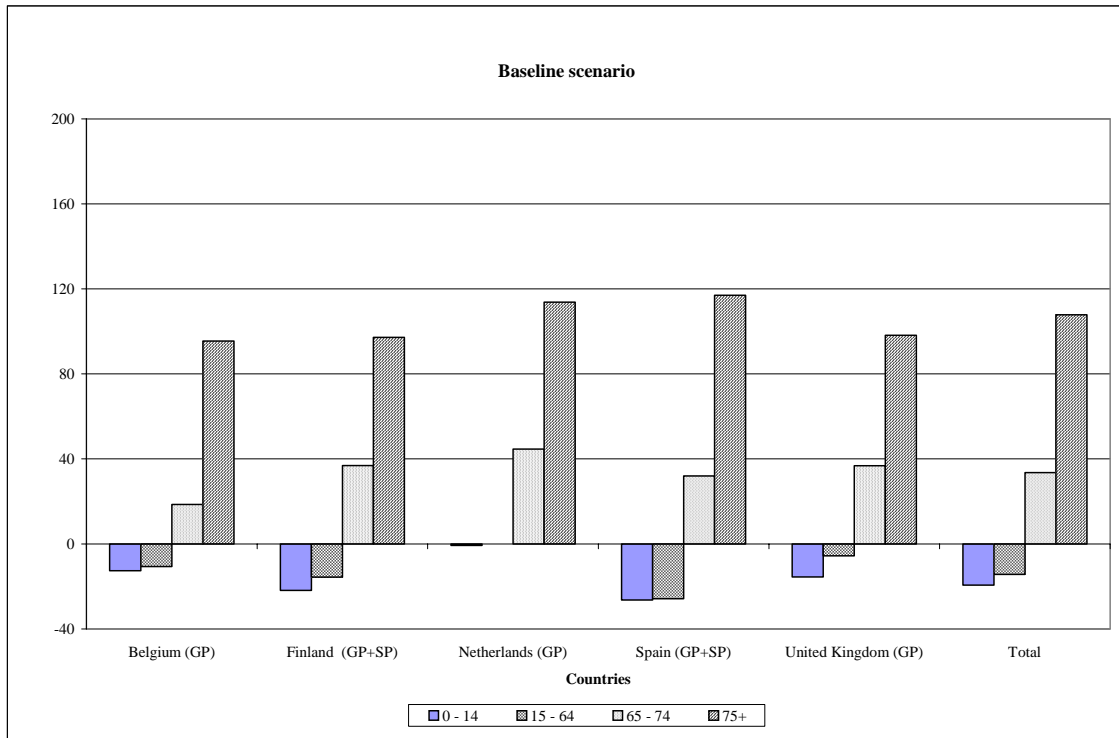


Table 2.7 Age structure of contacts with a doctor (%)

Countries	Baseline scenario				Living-longer-high scenario			
	Age-groups							
	0 - 14 <sup>4)</sup>	15 - 64 <sup>5)</sup>	65 - 74	75+	0 - 14 <sup>4)</sup>	15 - 64 <sup>5)</sup>	65 - 74	75+
2001								
Belgium <sup>1)</sup> (GP)	11,6	52,5	15,8	20,1	11,6	52,5	15,8	20,1
Finland <sup>2)</sup> (GP+SP)	15,3	65,5	11,4	7,8	15,3	65,5	11,4	7,8
Netherlands (GP)	14,7	64,1	10,1	11,1	14,7	64,1	10,1	11,1
Spain <sup>1)</sup> (GP+SP)	15,7	58,7	12,2	13,4	15,7	58,7	12,2	13,5
United Kingdom <sup>3)</sup> (GP)	14,5	63,4	11,3	10,8	14,5	63,4	11,3	10,8
Total	14,9	60,7	11,9	12,5	14,9	60,7	11,9	12,6
2020								
Belgium <sup>1)</sup> (GP)	9,6	48,6	18,2	23,5	9,4	47,5	18,1	25,0
Finland <sup>2)</sup> (GP+SP)	12,9	59,1	17,5	10,5	12,7	58,3	17,7	11,3
Netherlands (GP)	12,8	59,0	14,2	14,0	12,5	58,1	14,3	15,1
Spain <sup>1)</sup> (GP+SP)	13,5	57,0	12,8	16,7	13,2	56,1	12,8	17,9
United Kingdom <sup>3)</sup> (GP)	12,1	61,4	14,2	12,2	11,9	60,6	14,3	13,2
Total	12,6	58,4	14,0	15,1	12,4	57,4	14,0	16,2
2050								
Belgium <sup>1)</sup> (GP)	8,8	40,8	16,3	34,1	7,9	36,8	15,4	39,9
Finland <sup>2)</sup> (GP+SP)	12,1	56,3	15,9	15,6	11,4	53,5	15,9	19,3
Netherlands (GP)	12,5	54,8	12,4	20,2	11,5	50,8	12,2	25,4
Spain <sup>1)</sup> (GP+SP)	11,5	43,4	16,0	29,1	10,5	40,0	15,5	34,1
United Kingdom <sup>3)</sup> (GP)	11,2	54,9	14,2	19,7	10,4	51,4	14,0	24,2
Total	11,3	49,1	15,0	24,6	10,4	45,5	14,6	29,5

Average population based on: 1) 1997, 2) 1996, 3) 2000.- 4) Netherlands = 0-17 years.- 5) Netherlands = 18-64 years.  
 GP = General practitioner; SP = Specialist.  
 Source: Calculations by DIW.

*To summarise:* The number of contacts with a doctor could be estimated for general practitioners in Belgium, the Netherlands and the UK and for general practitioners and specialists in Finland and Spain. Generally, the expected increase in the number of contacts between 2001 and 2050 is moderate with 6% in the baseline and 15% in the living-longer high scenarios and less as in the case of hospital utilisation. Nevertheless, in the single age group clear changes are expected with a high increase in the share of the elderly using outpatient services.

## 2.2 Long-term care

The ageing process often involves functional disabilities and impairments in living independently as well as mental illness. In most cases this is a slow process. People with functional disabilities will increasingly need personal help and assistance in regularly recurring activities of daily living. The physical and functional impairments of people in

need of long-term care are not reversible. If their condition deteriorates, permanent personal help and nursing care are required. The elderly prefer living at home as long as it remains feasible and, in case of a need for long-term care, the partner or members of the extended family are the primary caregivers. Professional home care is however required if informal care-giving by partners or other members of the family is not possible. Nursing homes are in most cases the last choice.

The institutional settings and the extent of the supply of long-term care services within the community are strongly correlated with the long-term care policy (Eisen & Mager, 1999). In most countries, long-term care-giving is deemed to be a task of the extended family. Therefore, informal long-term care-giving by members of the family is dominant. Often institutional care-giving is provided for disabled persons with the worst health and in cases where adequate informal care-giving is not available. The number of beds in nursing homes is often not large enough to cover the demand. Waiting lists are common as a consequence. In several EU countries, it is difficult to obtain an overview of the number of people in need of long-term care. Often informal care-giving is not documented, and information regarding institutionalised persons and those who provide community care is difficult to collect.

For our participating countries it was also not easy to collect data about long-term care-giving in institutions and especially at home. That is because most social care for the elderly is the responsibility of the municipalities and different organisations (private/public) and/or political institutions provides care services, as previously mentioned. In most countries ‘care in the community’ is favoured as an alternative to long-term institutional care. Therefore, places in nursing homes have often been reduced in recent years and public monies moved from institutional care to home care. In Denmark, for example, the number of people in nursing homes has fallen dramatically, from 50,000 in 1987 to 36,500 in 1996. This was accompanied by a large increase in the number of home nurses and home helps employed by municipalities (EOHCS, 2001). In the UK between 1960 and 1980, around 100,000 people in need of long-term care were discharged into the community (EOHCS, 1999). Another trend could be observed in Belgium: they have planned to increase the places in combined rest and nursing homes, which provide a high level of nursing care (EOHCS, 2000a).

Providers of home care services supply a broad spectrum of services, so an overview about people receiving long-term care services is hard to gather. Provision of social care for the elderly – namely long-term care – is different among EU countries and also among the participating countries. But institutional care and home care services generally exist. Data about institutional care by age group are provided for Belgium, Denmark, Finland, France, Germany and the Netherlands. The UK could only provide data about residential care for people aged 65+ (not subdivided into age groups). Information about care-giving at home in most participating countries is related to formal care-giving by professionals. In Germany informal care-giving is included, if people receive benefits from the long-term care insurance scheme.

For Spain no data could be collected. A report from the European Observatory on Health Care Systems (2000b, p. 84) for Spain pointed out that in Spain “most of the responsibilities within the field of social affairs have been transferred to the Autonomous Communities, which gradually enacted legislation in the 1980s to govern

social services provision within their area of responsibility. There is a national plan for the elderly aimed at improving older people's standard of living. This plan includes a component on health care which focuses on health promotion, the prevention of illness and accidents, and healthy lifestyle. Social services are responsible for elderly residential care." The total number of places amounted to 188,913 in 3,689 elderly homes in 1998. Additional places are purchased through contracts with private institutions. In 1998, there were 2.8 places per 1000 persons over 65. Home care is being expanded and within most municipalities an infrastructure exists to deliver basic support to those being cared for or caring for others at home. Accessibility to these services is severely restricted, however, and coordination with medical care is still lacking in many aspects (EOHCS 2000b, p. 85). The report summarised that long-term care for the elderly and handicapped is still considerably underdeveloped and managed by different organisational structures. In view of the different organisational structures, no comprehensive national database for long-term care services exists and no analyses can be carried out in this case. But it can be held that the supply of long-term care services in nursing homes or by home care are far away from meeting the need for long-term care in Spain.

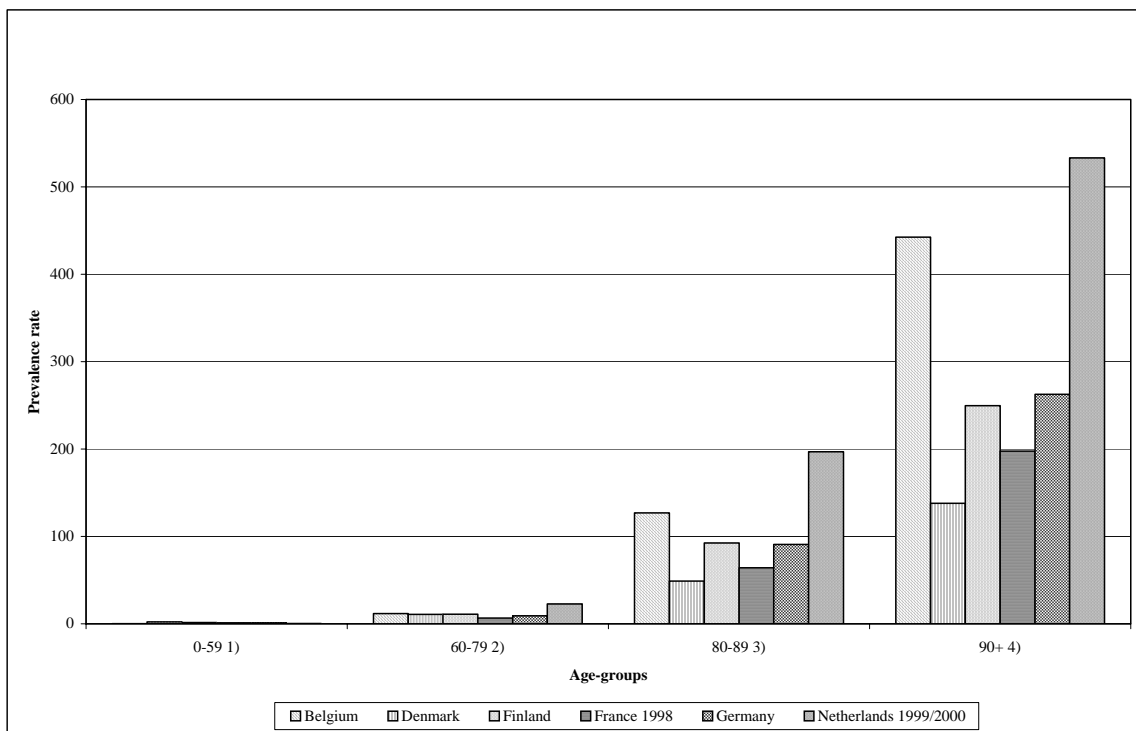
Another difficulty is that no general, internationally comparable definition of the need for long-term care exists. In Germany, for example, the social dependency insurance act includes a definition of the need for long-term care: people in need of long-term care are "persons with physical or mental disability, who need assistance in normally and regularly recurring activities of daily living on a long-term basis, prospectively for at least 6 months, to a substantial or exceeding degree".

In all participating countries indices of activities in daily living (ADL) and instrumental activities in daily living (IADL) were used to define the need for long-term care. But the composition of indices and the frequency with which assistance is needed can differ among the countries. In most countries no special long-term care insurance system or long-term care law exists. The need for long-term care is often governed by selected paragraphs in several pieces of legislation (social assistance, health security, etc.) and is the responsibility of the community or local government. Thus, it is feasible that in practice there are different definitions of the need for long-term care among the countries. In Germany, the statutory long-term care insurance scheme is using the following ADL and IADL indices: ADL – washing, bathing, brushing the teeth, combing, shaving, toileting, eating, getting in and out of bed, dressing, walking, standing, using stairs and walking outdoors; IADL – shopping, preparing meals, cleaning, dishwashing, laundering and heating the apartment/home. The law distinguishes between three levels of disability – substantial, severe and very severe – based on the frequency with which assistance is needed in personal care and housekeeping. At all levels of disability, people must need assistance in two or more ADLs and assistance in housekeeping for at least six months to be eligible. Therefore, severe disability is the condition required to receive benefits for long-term care in Germany.

### 2.2.1 Long-term care in institutions

The data provided allows the computation of prevalence rates of institutionalisation, i.e. the number of people receiving long-term care in institutions per 1000 inhabitants by age group. Figure 2.13 shows the prevalence rates for Germany, Finland, Belgium, the Netherlands, Denmark and France. In all countries the prevalence rates increase with age. The highest prevalence rates can be observed for the Netherlands, the second highest for Belgium. The figure shows clearly that long-term care-giving is related to the oldest old. Prior to the age of 60 long-term care-giving is seldom required, but for people aged 60-79 the prevalence rate is also low. After the age of 80, the possibility of long-term care-giving in institutions rises dramatically. In the oldest age group (90+) the prevalence rates are between 20% for France and more than 50% in the Netherlands.

Figure 2.13 People receiving long-term care in institutions per 1000 inhabitants (2001)



These prevalence rates were combined with the two population scenarios to estimate the development of the number of long-term care recipients in institutions. Table 2.8 shows the results for the six countries. In these countries, around 1.2 million people received institutional long-term care in 2001. The number of long-term care recipients in institutions is expected to increase by 2.7 million in the baseline scenario and by approximately 3.9 million in the living-longer high scenario. In the six countries the numbers of long-term care recipients will more than double with the exception of Denmark (Figure 2.14).

*Table 2.8 Number of long-term care recipients in institutions (per 1000 persons)*

Countries	2001	2010	2020	2030	2040	2050
Baseline scenario						
Belgium	89	111	134	157	195	214
Denmark <sup>1)</sup>	35	37	42	53	58	62
Finland	36	43	52	66	76	73
France <sup>1)</sup>	296	356	432	498	641	682
Germany	612	688	865	1 000	1 129	1 301
Netherlands	174	205	242	315	379	407
Total	1 244	1 441	1 768	2 089	2 477	2 739
Living-longer-high scenario						
Belgium	90	116	152	190	259	315
Denmark <sup>1)</sup>	35	38	46	62	74	86
Finland	37	45	57	77	98	102
France <sup>1)</sup>	297	369	476	582	813	931
Germany	612	716	965	1 218	1 467	1 874
Netherlands	175	215	275	391	523	625
Total	1 245	1 499	1 972	2 521	3 233	3 933
1) Only 15+ years.						
Source: Calculations by DIW.						

Around 820,000 long-term care recipients were aged 80+; 300,000 were aged 60 to 79 and 130,000 were aged under 60 in 2001 (Tables 2.9 and A20). By 2050 the number of long-term care recipients in institutions aged under 60 will decline to 108,000 (baseline and living-longer high scenarios), but the number of the older and especially the oldest old long-term care recipients will rise sharply. In the baseline scenario around 400,000 long-term care recipients will be aged 60-79 and 2.2 million will be aged 80+ in 2050. In the living-longer high scenario the number of these recipients will be 1.2 million higher.

Thus, the number of the oldest old (80+) recipients will nearly triple by 2050 in the baseline scenario and quadruple in the living-longer high scenario (Figure 2.15 and Table A21). The change in this age group is expected to be highest in France in the baseline scenario (an increase by 186%) and in Belgium in the living-longer high scenario (an increase by 331%).

Figure 2.14 Development of the number of long-term care recipients in institutions

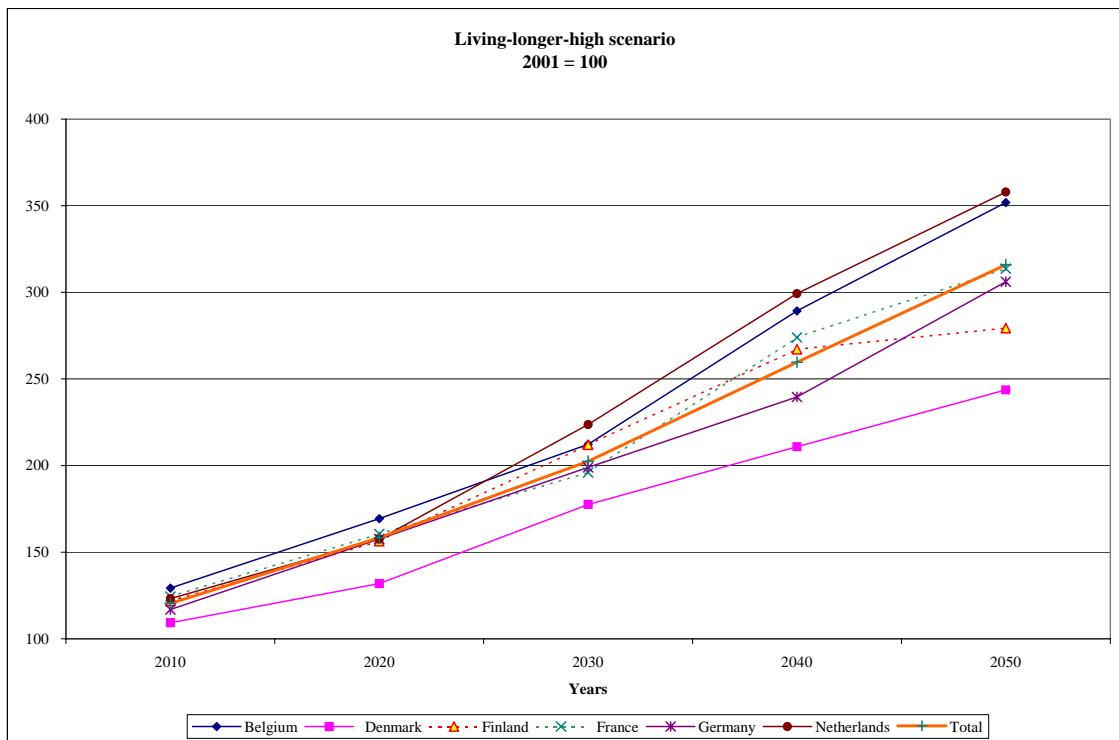
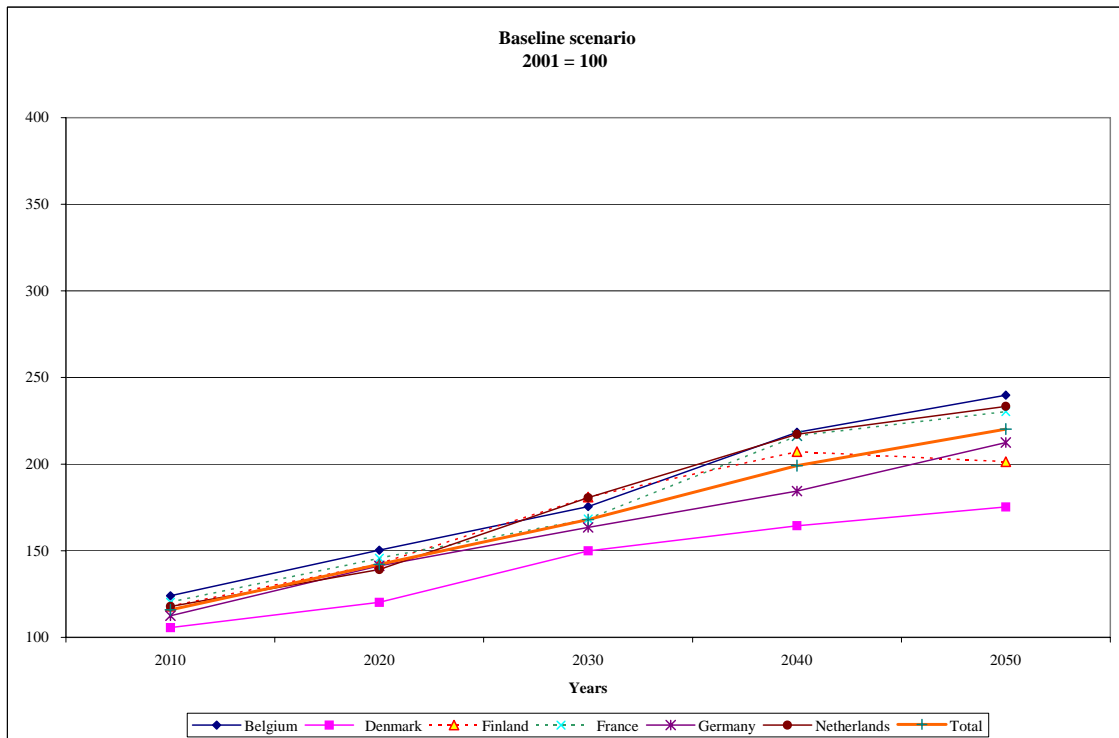


Table 2.9 Long-term care recipients in institutions by age group (per 1000 persons)

Countries	Baseline scenario				Living-longer-high scenario			
	Age-groups							
	0 - 59 <sup>1)2)</sup>	60 - 79 <sup>2)</sup>	80+	Total	0 - 59 <sup>1)2)</sup>	60 - 79 <sup>2)</sup>	80+	Total
2001								
Belgium	2	22	65	89	2	22	65	90
Denmark	7	9	19	35	7	9	19	35
Finland	6	10	20	36	6	10	20	37
France	37	67	193	296	37	67	193	297
Germany	70	153	389	612	70	153	389	612
Netherlands	5	38	131	174	5	38	131	175
Total	128	299	817	1 244	128	299	819	1 245
2020								
Belgium	2	25	107	134	2	26	123	152
Denmark	7	14	22	42	7	14	25	46
Finland	6	15	32	52	6	15	36	57
France	36	82	314	432	36	84	357	476
Germany	71	180	614	865	71	186	708	965
Netherlands	5	57	180	242	5	60	210	275
Total	127	373	1 268	1 768	127	386	1 459	1 972
2050								
Belgium	2	28	184	214	2	31	282	315
Denmark	6	14	41	62	6	16	63	86
Finland	5	13	55	73	5	14	83	102
France	32	98	551	682	33	106	792	931
Germany	56	189	1 055	1 301	57	207	1 610	1 874
Netherlands	5	60	341	407	5	68	552	625
Total	108	403	2 228	2 739	108	443	3 382	3 933
1) Denmark and France = 15-59 years.- 2) Netherlands = 0-64 years and 65-79 years.								
Source: Calculations by DIW.								

Examining the age structure of long-term care recipients shows the same picture. Around two-thirds of the recipients in the six countries altogether were aged 80+ in 2001; the share of the oldest old will increase by up to 81% in the baseline scenario and 86% in the living-longer high scenario by 2050 (Figure 2.16 and Tables A22-A23). In 2050 Denmark shows the ‘youngest’ age structure of long-term care recipients. Only two out of three long-term care recipients in institutions will be aged 80+ in 2050 in the baseline scenario in Denmark, whereas in Belgium around 86% of people receiving long-term care in institutions will be aged 80+ in 2050 (baseline scenario).



Figure 2.15 Changes in the number of people receiving long-term care within the age groups between 2001 and 2050

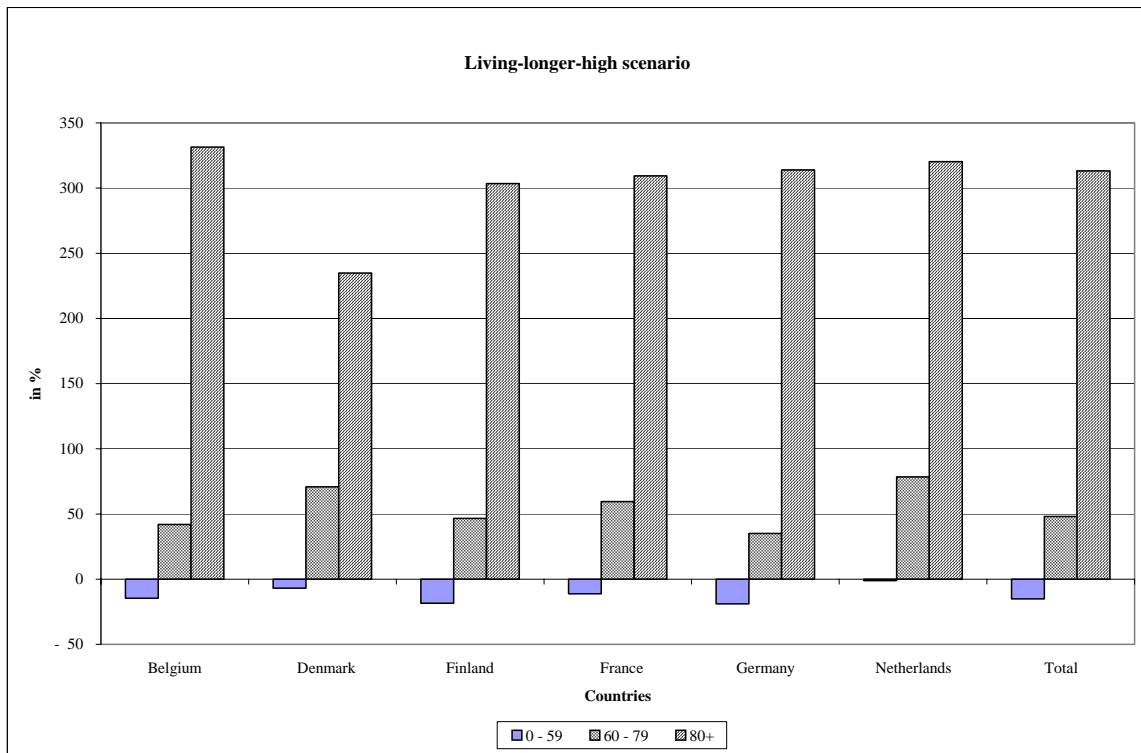
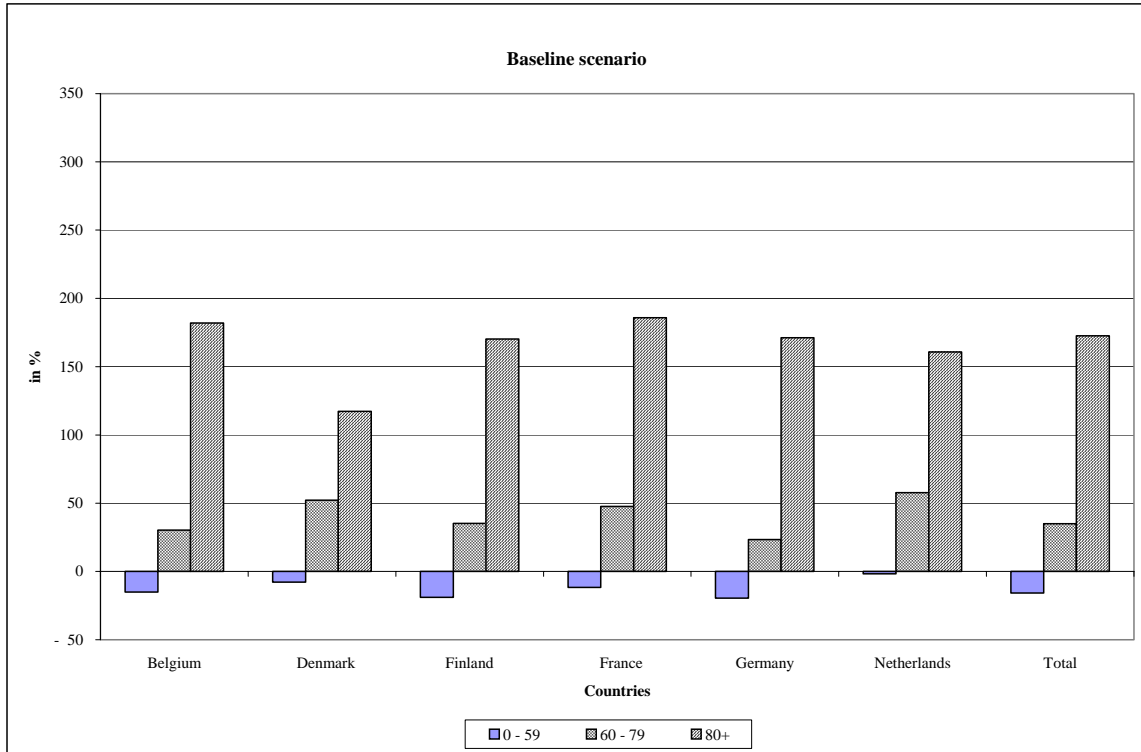
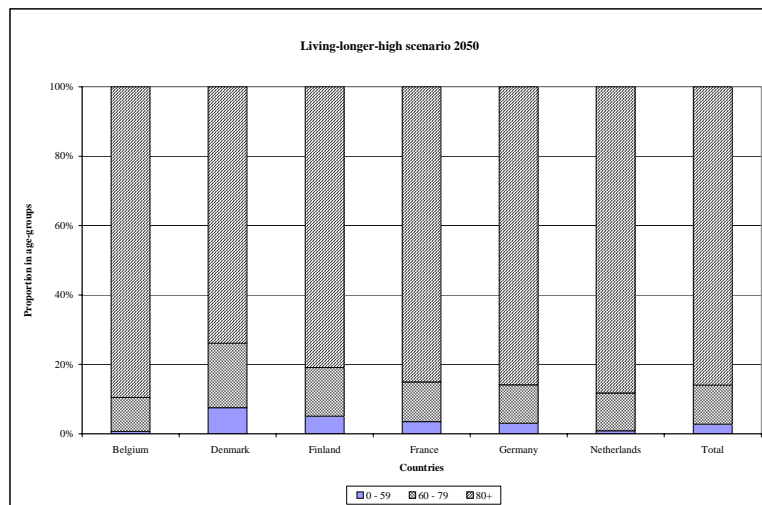
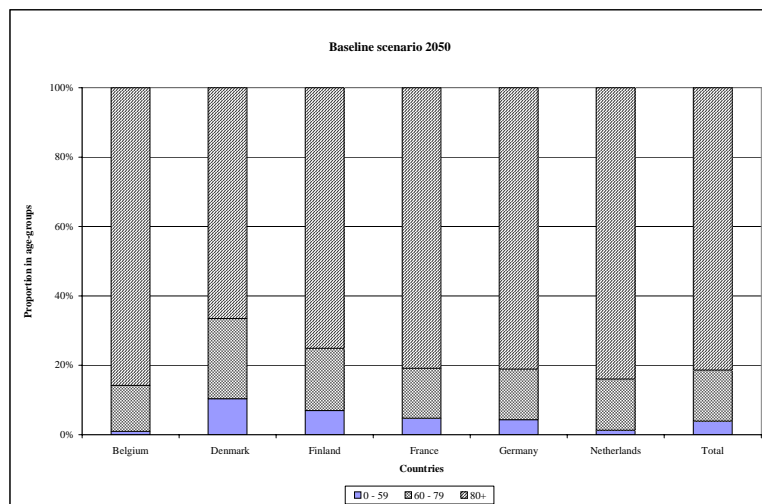
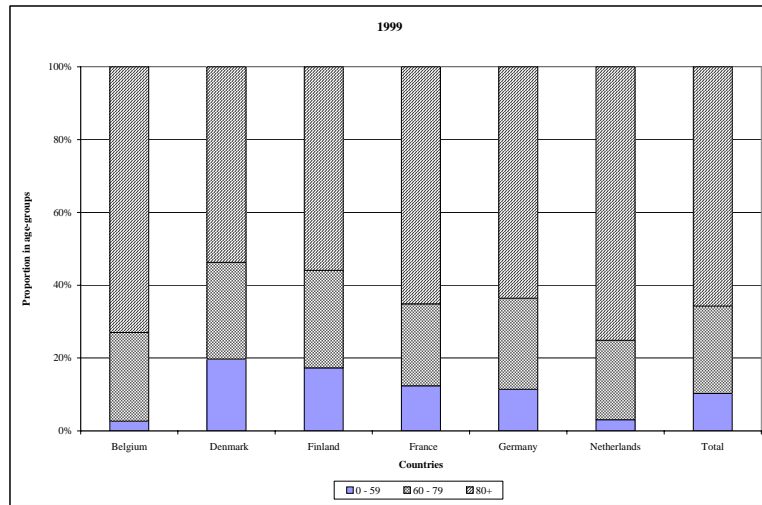


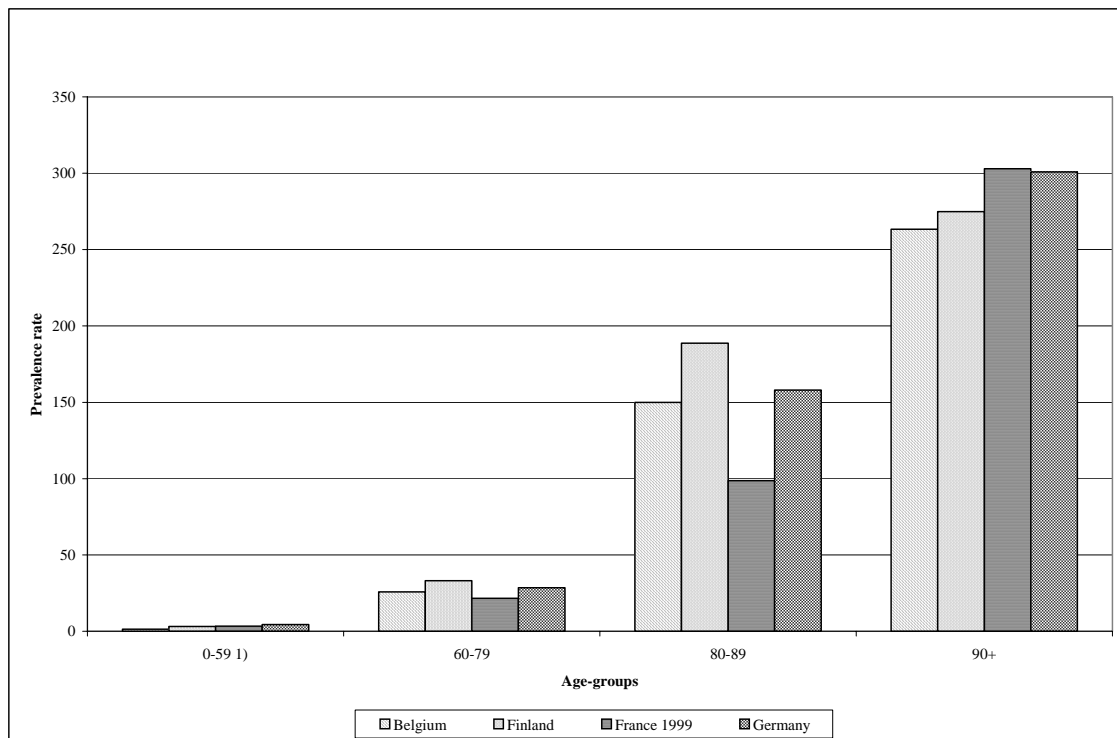
Figure 2.16 Age structure of long-term care recipients in institutions



### 2.2.2 Long-term care at home

Four countries have provided data on care-giving at home by professional care-givers. Figure 2.17 shows the number of people receiving long-term care at home per 1000 inhabitants in 2001 for Germany, Finland, France and Belgium. The prevalence rates are highest for Germany, because the data for Germany includes formal care-giving at home and informal care-giving insofar as people in need of care receive benefits from the long-term care insurance schemes. But also in Finland a high share of the elderly receive formal care-giving at home. Care-giving at home is also related to the oldest old, but on average the people receiving formal care at home are younger than those institutionalised. Around 3% (Finland and Germany) and 1.3% (Belgium) of people aged 60-79 receive formal home care, but only 0.15% were institutionalised.

Figure 2.17 People receiving long-term care at home per 1000 inhabitants (2001)



To estimate the future development of care-giving at home (by professionals) the prevalence rates of the most recent year were held constant and combined with the two demographic scenarios. The results for the four countries (Belgium, Finland, France and Germany) are shown in Table 2.10. Around 2.2 million persons received long-term care at home in 2001. The number of recipients will rise up to 4 million in the baseline scenario and 5.4 million in the living-longer high scenario by 2050. There are no great differences in the development between the four countries, but Belgium and France are expected to have the highest increases (Figure 2.18).

*Table 2.10 Long-term care recipients at home (1000 persons)*

Countries	2001	2010	2020	2030	2040	2050
Baseline scenario						
Belgium	123	148	169	198	232	239
Finland	78	92	110	137	147	142
France <sup>1)</sup>	642	749	887	1 021	1 220	1 272
Germany	1 338	1 512	1 791	1 993	2 228	2 387
Total	2 182	2 501	2 956	3 348	3 828	4 041
Living-longer-high scenario						
Belgium	123	153	184	228	287	322
Finland	78	95	119	156	182	186
France <sup>1)</sup>	643	769	957	1 153	1 485	1 653
Germany	1 338	1 557	1 946	2 310	2 730	3 206
Total	2 183	2 573	3 205	3 848	4 684	5 367
1) Only 15+ years.						
Source: Calculations by DIW.						

The long-term care recipients at home are on average younger than the long-term care recipients in institutions. Nevertheless, the increase in the oldest age group (80+) is highest. The number of long-term care recipients at home aged 80+ will rise from around 1 million in 2001 to 2.7 million in the baseline scenario and to around 4 million in the living-longer high scenario by 2050 (Tables A24 and A25). As in the case of institutional care, the number of recipients aged 80+ will nearly triple by 2050, while in the age group 60-79 the increase will be around 30% and in the younger age group a decrease is expected (Table 2.11). Thus, the age structure of long-term care recipients at home will change (Figure 2.19 and Tables A26 and A27). Around 20% of recipients were aged under 60, 35% were aged 60-79 and 46% were aged 80+ in 2001. In the baseline scenario (and living-longer high scenario) the share of long-term care recipients at home under the age of 60 will decline to 9% (7%), the share of recipients aged 60-79 will increase to 24% (20%) and the share of the oldest old will rise up to 67% (74%) by 2050.

*To summarise:* information about long-term care-giving in nursing homes or homes for the elderly are available for six countries: Belgium, Denmark, Finland, France, Germany and the Netherlands. Thus the further development of long-term care recipients in homes could be estimated for these countries. But a projection of long-term care recipients at home could only be carried out for four participating countries: Belgium, Finland, France and Germany. Long-term care at home in Belgium, Finland and France only includes care-giving at home by professional care-givers. In Germany additional care-giving by members of the family or other informal care-givers is included if the person in need of care receives cash benefits for informal care from the insurance schemes.

Figure 2.18 Long-term care recipients at home

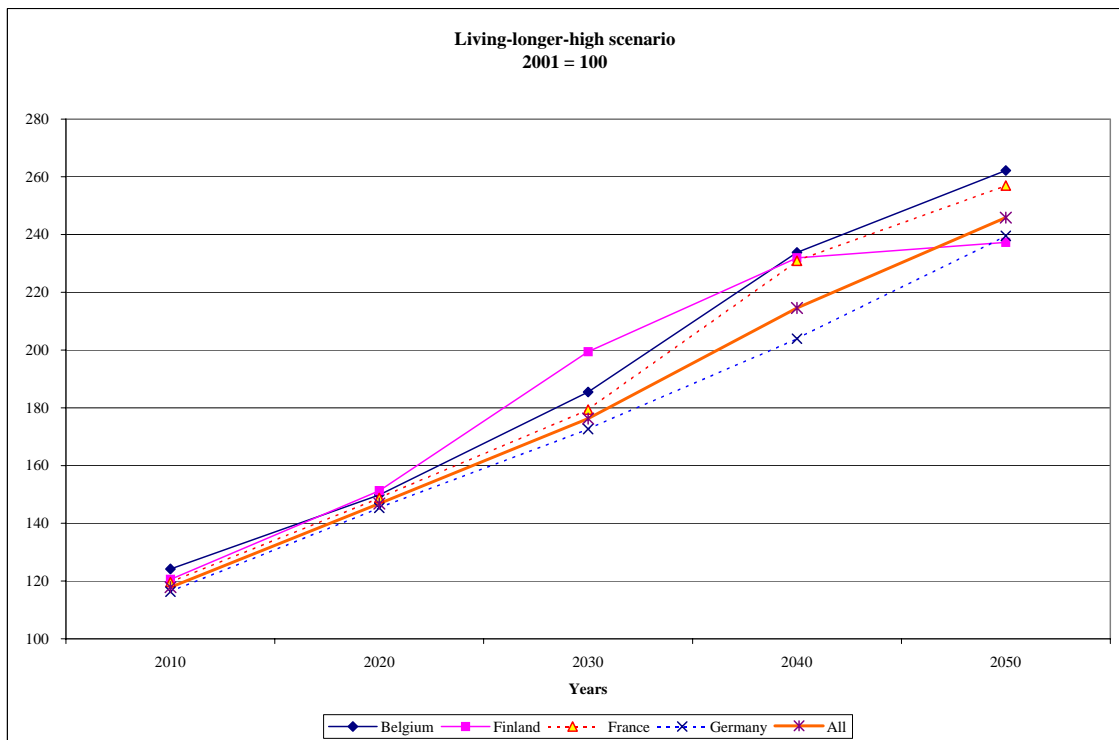
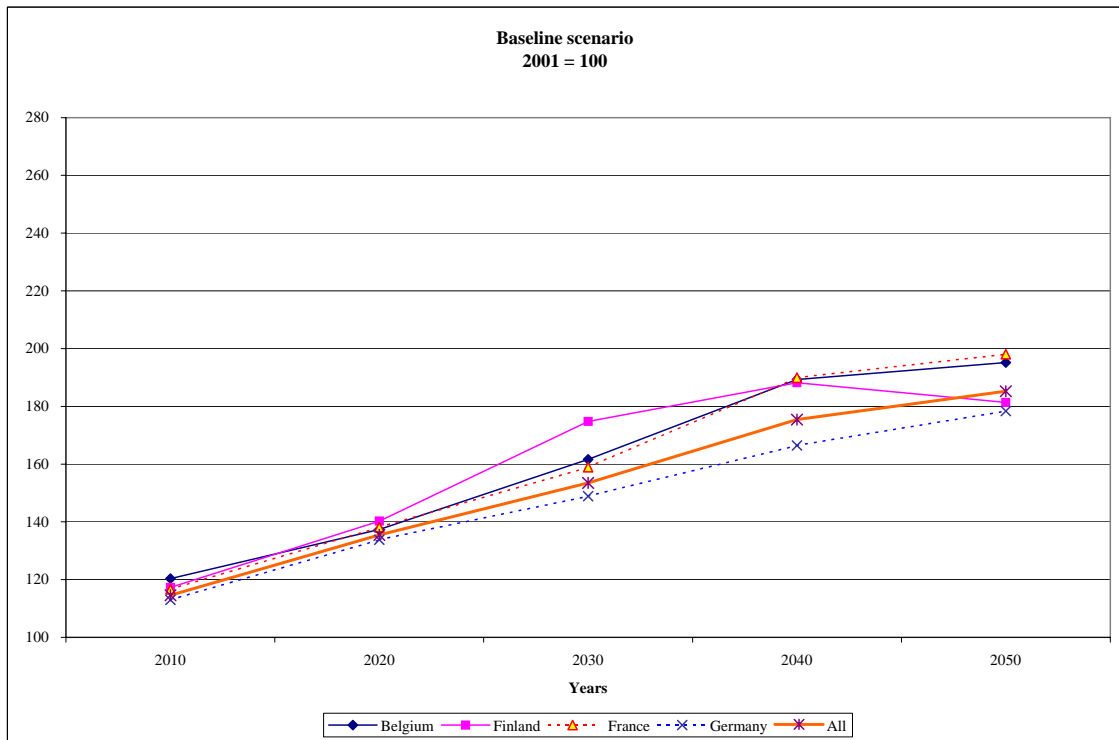


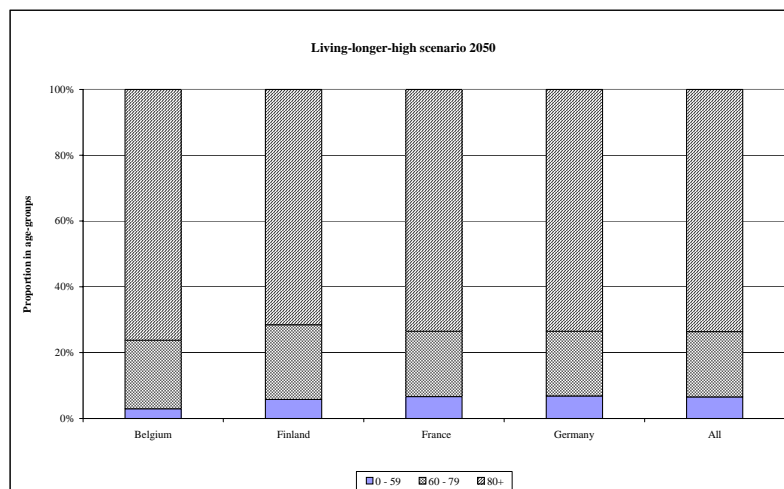
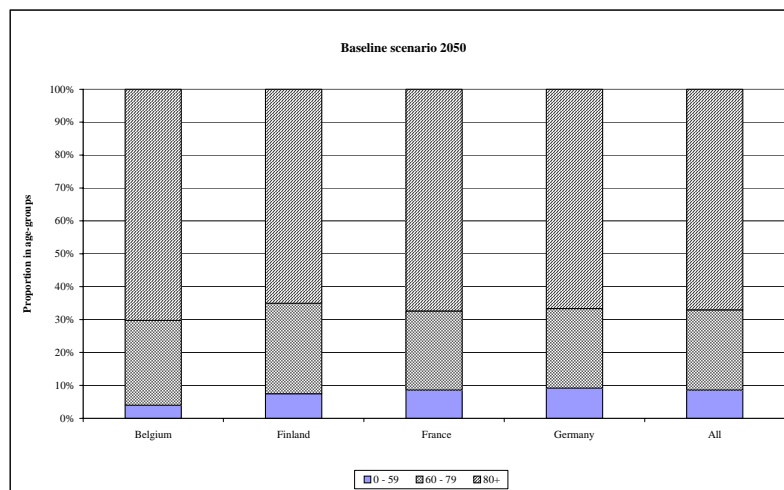
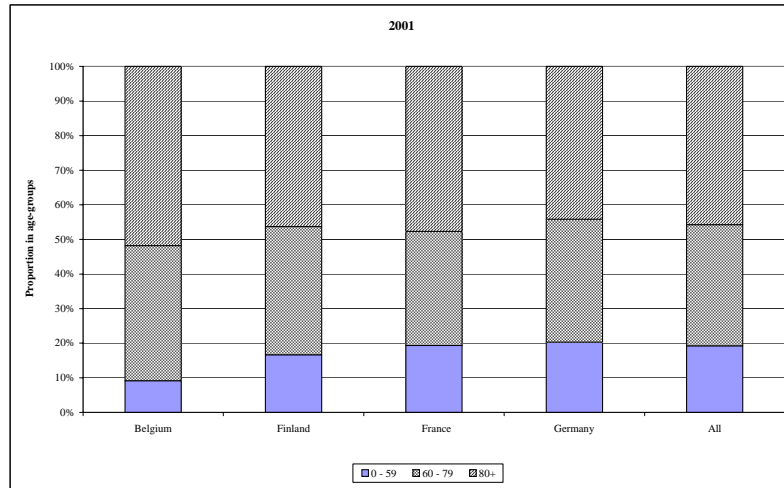
Table 2.11 Long-term care recipients at home by age group (2001 = 100)

Countries	Baseline scenario				Living-longer-high scenario			
	Age-groups							
	0 - 59 <sup>1)</sup>	60 - 79	80+	Total	0 - 59 <sup>1)</sup>	60 - 79	80+	Total
2020								
Belgium	94	119	159	137	94	122	180	150
Finland	91	149	151	140	91	154	171	151
France	97	130	160	138	98	133	180	149
Germany	99	117	163	134	100	121	186	145
Total	98	122	162	136	99	126	183	147
2050								
Belgium	85	129	264	195	85	140	385	262
Finland	81	135	255	181	82	146	366	237
France	88	144	280	198	89	154	396	257
Germany	81	121	269	178	81	132	399	240
Total	83	129	272	185	83	139	396	246
1) France = 15-59 years.								
Source: Calculations by DIW.								

The number of long-term care recipients is expected to increase markedly. On average the number of recipients will more than double. The shift towards the oldest old will continue. The number of recipients aged 80+ will triple in the baseline scenario and quadruple in the living-longer high scenario, whereas the number and proportion of the 'younger' long-term care recipients will decline. The development will be nearly the same for long-term care-giving in institutions and long-term care-giving at home. In several EU countries, waiting lists for nursing homes already exist. The pressure from the demand side will increase dramatically. Especially for the oldest old, care-giving at home is in most cases not possible and places in nursing homes are needed. Communities have to ensure that they can meet the challenge. This will not be an easy task.

Furthermore, the increasing need for long-term care-giving at home is not easily met. The high increase in the numbers of the oldest individuals means that the potential care-givers are, on average, also older. But as health status deteriorates with age, the share of care-givers in bad health will increase, thus informal care-giving could become a hard task. It can be expected that the need for professional home care and the demand for day care or night care will increase – more than the figures for population development show.

Figure 2.19 Age structure of long-term care recipients at home



## 2.3 Summary

In this chapter the development of hospital cases, hospital bed days, contacts with a doctor and long-term care recipients in institutions and at home are projected using the national sources for utilisation data and the two demographic scenarios. In this part no health scenarios could be used, because the national sources do not allow utilisation to be desegregated by health status. The advantage of the national sources is that the total population is mostly covered and thus the development of utilisation caused by the ageing process and increasing life expectancy can be shown for a single country. But not all the utilisation data are available for all participating countries (Belgium, Denmark, Finland, France, Germany, the Netherlands, Spain and the UK). Whereas data on hospital utilisation are available for all countries, the number of contacts with a doctor are not available for Denmark, France or Germany, data on long-term care in institutions are not available for Spain or the UK and data on long-term care at home by professional care-givers are not available for Denmark, the Netherlands, Spain or the UK. Table 2.12 shows the results for the projections for the total population and Table 2.13 shows the results for the elderly (75+ and 80+ respectively).

*Table 2.12 Development of the population, health care utilisation and long-term care recipients (1999 = 100)*

Countries	Baseline scenario					Living-longer-high scenario				
	Population	Hospital days	Contacts with a doctor <sup>2)</sup>	LTC <sup>2)</sup> institutions	LTC <sup>2)</sup> at home	Population	Hospital days	Contacts with a doctor <sup>2)</sup>	LTC <sup>2)</sup> institutions	LTC <sup>2)</sup> at home
2020										
Belgium	103	120	110	150	137	104	125	113	169	150
Denmark	104	120	-	120	-	106	125	-	132	-
Finland	103	133	105	142	140	104	141	107	156	151
France	106	116 <sup>1)</sup>	-	146 <sup>3)</sup>	138 <sup>3)</sup>	108	119 <sup>1)</sup>	-	161 <sup>3)</sup>	149 <sup>3)</sup>
Germany	101	118	-	141	134	103	123	-	158	145
Netherlands	108	132	112	139	-	110	137	114	158	-
Spain	100	117	105	-	-	101	122	107	-	-
United Kingdom	105	115 <sup>1)</sup>	107	-	-	106	121 <sup>1)</sup>	109	-	-
2050										
Belgium	99	135	115	240	195	104	158	128	352	262
Denmark	104	135	-	175	-	110	159	-	244	-
Finland	95	155	98	201	181	101	190	104	279	237
France	105	122 <sup>1)</sup>	-	230 <sup>3)</sup>	198 <sup>3)</sup>	110	133 <sup>1)</sup>	-	314 <sup>3)</sup>	257 <sup>3)</sup>
Germany	92	122	-	212	178	98	140	-	306	240
Netherlands	110	149	117	233	-	116	177	127	358	-
Spain	88	132	100	-	-	94	154 <sup>1)</sup>	110	-	-
United Kingdom	104	142 <sup>1)</sup>	109	-	-	109	173	117	-	-

1) 2000 = 100.- 2) 2001 = 100.- 3) Only 15+ years.  
Source: Calculations by DIW.

According to the baseline scenario, the number of inhabitants will decline in four participating countries – Belgium, Finland, Germany and Spain – and will increase in the other four participating countries – Denmark, France, the Netherlands and the UK by 2050 (Table 2.12). Nevertheless, in all the countries the number of hospital days will increase on average by 29% by the year 2050. This increase could be traced back to the opposite trends in the younger and older ages. While the hospital days of persons aged 75+ will increase on average by 118%, in the younger ages declines of 18% (0-14) and 12% (15-64) are expected.



*Table 2.13 Development of the population aged 75+, health care utilisation (75+) and long-term care recipients (80+) (1999=100)*

Countries	Baseline scenario					Living-longer-high scenario				
	Population	Hospital days	Contacts with a doctor <sup>2)</sup>	LTC <sup>2)</sup> institutions	LTC <sup>2)</sup> at home	Population	Hospital days	Contacts with a doctor <sup>2)</sup>	LTC <sup>2)</sup> institutions	LTC <sup>2)</sup> at home
	People 75+	75+	75+	80+	80+	People 75+	75+	75+	80+	80+
	2020									
Belgium	136	136	129	164	159	148	148	141	189	180
Denmark	130	131	-	116	-	143	144	-	134	-
Finland	149	151	142	155	151	163	165	155	177	171
France	137	134 <sup>1)</sup>	-	163	160	148	145 <sup>1)</sup>	-	184	180
Germany	158	159	-	158	163	173	174	-	182	186
Netherlands	144	150	142	137	-	158	165	157	160	-
Spain	139	145	131	-	-	152	159	143	-	-
United Kingdom	122	122 <sup>1)</sup>	121	-	-	134	137 <sup>1)</sup>	132	-	-
	2050									
Belgium	205	205	195	282	264	268	268	255	431	385
Denmark	192	193	-	217	-	258	260	-	335	-
Finland	207	209	197	270	255	273	275	259	404	366
France	225	219 <sup>1)</sup>	-	286	280	282	274 <sup>1)</sup>	-	409	396
Germany	217	218	-	271	269	287	288	-	414	399
Netherlands	216	230	214	261	-	296	320	293	420	-
Spain	231	238	217	-	-	297	314	279	-	-
United Kingdom	200	214 <sup>1)</sup>	198	-	-	266	300 <sup>1)</sup>	262	-	-

1) 2000 = 100.- 2) 2001 = 100.  
Source: Calculations by DIW.

For the most part, the growth rate of persons aged 75+ is comparable with the growth rate of hospital days (Table 2.13). Half of the hospital days will be required for persons aged 75+ in 2050. The spectrum of diseases of the elderly is different from that of the younger inpatients and thus the elderly require another spectrum of hospital treatments. Besides acute illnesses, old people generally suffer from functional disability and mental illness. This significant structural change in demand requires substantial reorganisation and restructuring of hospital departments. As previously mentioned, government officials and hospital administrators should take this information into account in the strategic planning of hospital services as well as in the training of medical and nursing staff.

With respect to the reduced mortality rates for persons aged 20 to 90, the living-longer high scenario leads to a more dynamic development in the number of hospital days.

An estimation of the number of contacts with a doctor was performed for five participating countries. A moderate increase (and for Finland a decline) is expected until 2050. As in the case of hospital days, the decline in the number of contacts with a doctor in the younger age groups counteracts the increase in the older ages.

The development of people receiving long-term care seems to be more dramatic. For six participating countries it was possible to estimate the development of long-term care-giving in institutions. On average an increase of 120% by the year 2050 is expected. And the number of people receiving long-term care by professional care-givers at home will double by 2050. These results must be interpreted with caution, because the underlying prevalence rates are the result of the institutional settings and the political strategies/decisions in the base year. In most EU countries long-term care-giving seems

to be the task of the family and waiting lists for nursing homes exist. The supply of community care by district nurses or day care or night care centres depends on political decisions. Therefore, the estimated development can be deemed to be on the lower side of the 'need' for long-term care. The pressure on professional long-term care-giving will be exacerbated by changes in the family structure and the increasing labour force participation of women.

In the case of long-term care the results are comparable with results from previous studies (Jacobzone et al., 1998 and 2000; Jacobzone, 1999; Bebbington, 2000; Wittenberg et al., 1998; Dietz, 2002). Jacobzone analysed the disability trends and the implications for long-term care-giving in nine countries (Australia, Japan, France, the UK, Germany, Sweden, Canada, the Netherlands and the US). He pointed out that no general trend in disability could be observed in these countries. He groups the countries into those with no gains in disability, moderate or mixed results and significant gains. In the static approach, constant institutionalisation or disability rates were assumed and the numbers of institutionalised persons and disabled persons in households were estimated. For four countries the results can be compared with the results presented here. The results for a single country are a bit different from the results presented here, but the trend is the same: a high increase in the 'need' for long-term care-giving (Table 2.14).

*Table 2.14 Development of long-term care-giving*

Countries	Growth rate in % 2020/2000	
	Long-term care institutions	Long-term care community
France	28,7	53,7
Germany	30,0	31,9
Netherlands	43,5	46,3
UK	17,8	21,2

Source: Jacobzone (1998)

Bebbington (2000) analysed the trends in life expectancy, healthy life expectancy and age-specific disability rates in the past and the implication for long-term care-giving in the UK (England). He arrived at the conclusion that the observed gains in life expectancy are mostly years spent in illness and that no improvements in age-specific disability rates could be observed. The study from Bebbington confirms the results of the study for England carried out by Wittenberg et al. (1998). They estimated the number of elderly persons living in residential care homes, nursing homes and in hospitals by 2031. The data stem from the General Household Survey 1994-95 and includes persons aged 65+. Assuming constant prevalence rates they calculated an increase in the number of people living in residential and nursing homes to be 22.8% between 2000 and 2020.

Dietz (2002) analysed the development of life expectancy and morbidity in Germany. He focused on age-specific diseases. He came to the result that the life span with chronic diseases and functional disability has increased in the past and that this trend will continue.

## **Chapter 3.**

### **Effect of Improving Health and Ageing on Health Care Utilisation**

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In chapter 2 the national sources for utilisation data were combined with the two demographic scenarios. Chapter 2 shows the further development in the main fields of acute care and long-term care in institutions and by professional care-givers at home for the total population. Since the national data includes no information on utilisation by health status, only the effects of demographic change and living longer could be taken into account. In chapter 3 utilisation data from the European Community Household Panel (ECHP) were used, which covers on the one hand (only) persons in private households aged 16+, but on the other hand allows differentiation of the utilisation by health status. These data were combined with the four demographic and health scenarios: the baseline scenario, the baseline scenario with improving health, the living-longer high scenario and the living longer in better health scenario. In this chapter the development of the number of hospital admissions, the number of bed days and the number of contacts with a general practitioner can be estimated for the four scenarios. Thus, the main fields of acute care are also covered by these projections, but no information exists about long-term care recipients. The ECHP only covers persons in private households, not those in institutions. But it includes information about longstanding illness/disability. To get an idea about the scope of people with the potential need of care, the numbers of people who were severely hampered in their daily activities caused by disability/longstanding illness and who have had to cut down things they usually do were used.

#### **3.1 Hospital utilisation**

The ECHP includes information about hospital admissions and the length of hospital stay. It asked if a person was admitted to a hospital at least once in the last year as an inpatient and how many nights he/she spent in a hospital in the past 12 months. The utilisation data from the ECHP are therefore not fully compatible with the national data, because the latter refer to hospital cases. That means if a person was in a hospital more than once in the last year, the number of stays were counted. And also the number of hospital days from the national sources refers to the single hospital stay, whereas in the ECHP the hospital days of all hospital stays in the last year were totalled.

Another point is that the sample size of the ECHP is not large enough to calculate representative utilisation data differentiated by country, age group and health status for a single year. Therefore, utilisation data were calculated as a three-year average for the years 1999-2001. These utilisation data in a single health status, age group and country were held constant over the forecast period and combined with the demographic and health scenarios. The demographic scenarios lead to changes in the number and age structure of persons for a given health status, while the health scenarios lead to changes in the proportion of people in good, fair and bad health status for a given age group. Therefore, the effect of demographic development, improvements in life expectancy and changes in the health status can be shown.

### 3.1.1 Hospital admissions

Table 3.1 shows the proportion of people admitted into a hospital at least once in the last year by health status in the participating countries and the EU (without Luxembourg or Sweden). The proportion of admitted people increases with age and at a given age if the health status deteriorates. This trend can be observed in all countries. In the EU on average around 5% of people in good health, 12% of people in fair health and 28% of people in bad health were admitted into a hospital in 2001. In the participating countries altogether the proportion of admitted people was a little bit higher: 6%, 14% and 29% respectively.

*Table 3.1 Proportion of people admitted into a hospital by health status in participating countries and the EU<sup>1)</sup> 1999-2001 (%)*

Age-groups	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK	EU <sup>1)</sup>
People in good/very good health									
15-29	7,5	6,7	6,9	4,4	8,0	3,8	2,8	7,0	4,9
30-44	5,9	5,8	7,1	3,9	7,4	5,3	4,2	6,2	4,6
45-59	7,3	5,2	7,4	4,4	6,2	2,9	4,1	3,3	4,0
60-69	9,0	6,3	10,0	6,5	6,8	5,3	5,0	6,1	6,1
70-79	10,3	11,1	14,0	8,9	10,4	6,8	8,0	7,7	9,0
80+	15,9	12,3	23,7	12,2	12,9	7,5	9,8	10,4	10,0
Total	7,4	6,3	7,5	4,7	7,4	4,5	4,0	5,9	4,8
People in fair health									
15-29	16,2	21,2	17,3	11,7	13,4	10,1	12,6	11,0	12,0
30-44	14,6	14,9	15,9	11,3	11,6	11,7	10,8	11,3	11,1
45-59	19,9	13,3	16,4	13,4	9,8	9,7	10,3	8,7	10,7
60-69	17,0	19,3	16,5	14,8	13,9	14,0	11,0	12,0	12,0
70-79	28,0	21,2	20,2	17,8	16,5	18,8	15,0	15,7	16,3
80+	28,8	24,9	26,8	18,9	20,3	15,6	16,4	21,5	17,9
Total	20,2	17,5	17,2	14,0	12,5	12,8	12,3	11,7	12,4
People in bad/very bad health									
15-29	25,0	39,5	36,7	40,8	27,0	27,9	32,5	26,1	33,1
30-44	39,0	36,8	41,3	31,2	23,4	21,5	25,9	26,7	27,1
45-59	39,1	33,3	26,5	38,2	23,8	21,1	20,3	22,6	25,5
60-69	38,5	34,5	35,2	34,6	26,6	33,5	26,5	26,5	26,1
70-79	41,5	34,3	40,7	40,1	31,1	38,7	30,4	36,1	30,3
80+	87,2	44,2	33,7	35,2	36,1	28,3	27,5	35,1	28,0
Total	42,2	36,3	33,8	36,8	26,5	27,4	26,9	27,6	27,5

1) EU (15) without Luxembourg and Sweden; three-year-averages 1999-2001.

Source: ECHP wave 6-8.

In 2001 around 29 million people (15+) were admitted into a hospital in the EU, of which 10 million were in good health, 10 million were in fair health and 9 million were in bad health (Table A28). The figures for the participating countries altogether are: 24.2 million admitted people, of whom 8.1 million were in good health, 8.6 million were in fair health and 7.5 million were in bad health. By 2050 the number of people (15+) admitted at least once a year increases in the baseline scenario by 4.1 million in the EU and by 3.7 million in the participating countries altogether (Table A29). This is an increase of around 15% (Table A30). The highest increase can be observed for people in bad health – around 30% in the participating countries and 32% in the EU.

*Table 3.2 People admitted into a hospital by health status in 2050 in participating countries and the EU<sup>1)</sup> (2001 = 100)*

Health status	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK	All	EU <sup>1)</sup>
Baseline scenario										
good	101	107	94	106	83	109	87	107	97	94
fair	126	126	119	128	107	134	123	124	119	119
bad	147	136	144	135	126	134	141	125	130	132
total	119	120	113	124	108	123	117	117	115	114
Baseline scenario with improving health										
good	106	112	99	115	93	113	93	114	104	99
fair	129	125	121	134	116	137	128	129	126	125
bad	75	93	97	58	88	55	101	66	80	98
total	108	112	108	108	99	112	107	105	104	108
Living-longer-high scenario										
good	108	115	99	111	86	115	93	115	102	100
fair	144	145	134	141	120	154	140	141	134	134
bad	181	163	173	150	147	153	163	142	150	152
total	134	135	126	136	121	137	131	130	128	128
Living-longer better health scenario										
good	114	120	104	122	97	120	100	123	111	105
fair	148	144	137	148	130	158	146	147	141	141
bad	95	115	121	67	106	65	120	76	95	115
total	122	126	121	119	112	125	121	117	117	120

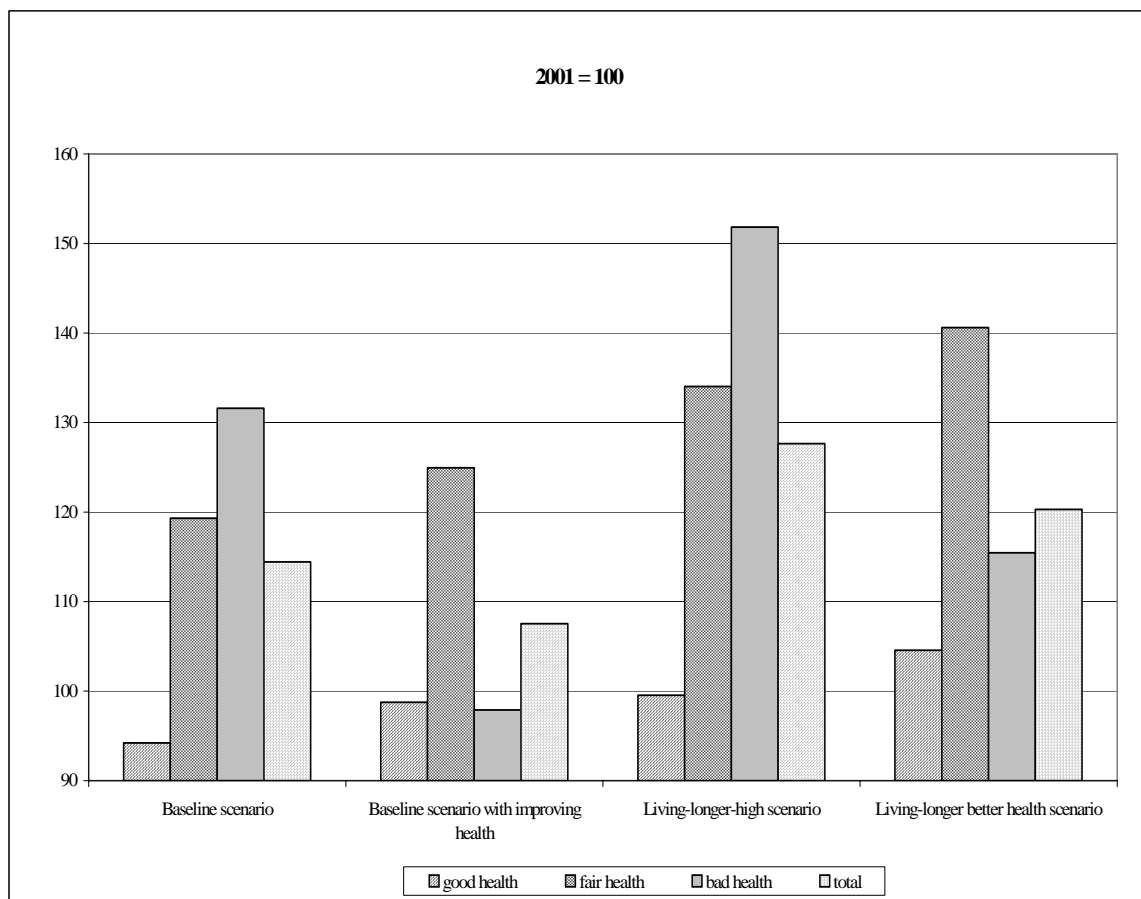
1) EU (15) without Luxembourg and Sweden; people aged 15+.  
Source: Projections by DIW.

The higher life expectancy in the living-longer scenario strengthens this development. The number of people admitted into a hospital increases by around 28% by 2050 and among people in bad health by around 50%. Improvements in health status lead to a contrary effect. The number of people admitted into a hospital account for 2.3 million people less in the baseline improving-health scenario compared with the baseline scenario in 2050. The increase in the percentage of admitted people in the baseline improving-health scenario is half as much as in the baseline scenario (EU).

Great differences can be observed in the development of hospital admissions of people in bad health between the scenarios with and without improvements in health. Under the assumption that additional years are years in good health, the number of admitted people in bad health decreases in the baseline improving-health scenario. Improving health has therefore an appreciable influence on the development of hospital admissions. But the development in the living longer in better health scenario shows that the effect of improving health is not great enough to completely compensate for the effect of an increasing life expectancy in the underlying scenarios. The changes in hospital admissions between 2001 and 2050 in percentages are a little bit higher in the living longer in better health scenario than in the baseline scenario.

The different developments in the four scenarios are shown in Table 3.2 and Figure 3.1. If the number of admissions in 2001 is set to 100, the number of admissions in 2050 in the EU is 114 in the baseline scenario, 108 in the baseline improving-health scenario, 128 in the living-longer scenario and 120 in the living longer in better health scenario.

*Figure 3.1 People admitted into a hospital by health status in the EU (2050)*



### 3.1.2 Hospital bed days

To show the development in hospital utilisation the number of people admitted into a hospital has to be multiplied by the length of hospital stay. The result is the number of bed days of inpatients within one year. Table 3.3 shows the mean value of days spent in a hospital during the past year. As in the case of hospital admissions, the length of hospital stay increases with age and at a given age if the health status deteriorates. People in good health spent on average around 7 days a year in a hospital, people in fair health spent 11 days and people in bad health spent 19 days in the EU (average 1999-2001). The figures for the participating countries altogether are nearly the same as for the EU.

*Table 3.3 Mean value of hospital days of inpatients within one year by health status in participating countries and the EU<sup>1)</sup>*

Age-groups	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK	EU <sup>1)</sup>
People in good/very good health									
15-29	4,0	4,6	3,5	4,5	8,2	6,7	6,6	3,3	5,8
30-44	5,1	6,3	3,9	4,9	7,7	3,5	4,9	4,0	5,7
45-59	6,3	6,7	3,9	4,7	9,2	6,4	5,2	4,2	6,9
60-69	6,6	8,7	4,8	5,9	9,1	7,8	8,6	6,5	7,9
70-79	12,0	12,6	6,4	9,2	13,5	7,8	12,8	7,9	10,5
80+	18,9	16,8	8,9	8,8	14,8	11,0	13,6	13,1	13,6
Total	6,6	7,2	4,0	5,4	8,4	5,6	6,9	4,8	6,8
People in fair health									
15-29	13,8	10,6	10,9	6,4	9,9	9,1	9,2	5,8	9,3
30-44	10,0	6,9	8,7	7,9	10,8	8,3	8,0	5,6	9,2
45-59	11,1	12,3	6,4	8,2	13,0	8,8	10,5	6,1	9,8
60-69	13,8	8,7	9,8	9,6	16,9	11,1	10,3	9,4	12,0
70-79	15,8	12,7	9,8	11,8	15,1	12,5	12,1	10,8	12,8
80+	18,3	15,3	13,9	14,5	17,2	13,7	11,6	15,7	15,1
Total	13,6	10,9	8,7	9,5	13,3	10,4	10,6	8,0	11,1
People in bad/very bad health									
15-29	43,3	15,1	13,1	18,9	17,8	17,7	20,9	8,3	17,6
30-44	28,5	15,9	22,7	14,0	16,3	12,6	20,9	9,3	17,2
45-59	22,2	30,1	17,2	19,4	22,6	18,1	13,3	11,9	19,3
60-69	16,2	23,6	20,6	18,9	22,5	19,3	17,9	11,9	19,4
70-79	26,3	26,5	20,5	23,8	24,1	24,3	21,7	17,1	20,6
80+	14,2	19,2	22,5	22,7	25,7	18,4	20,5	23,3	21,0
Total	23,0	23,3	19,8	20,1	21,8	19,0	19,3	13,1	19,2

1) EU (15) without Luxembourg and Sweden; three-year-averages 1999-2001.

Source: ECHP wave 6-8.

In 2001 around 350 million days were spent in a hospital in the EU, of which 67 million were used by people in good health, 111 million by people in fair health and 172 million by people in bad health. In the participating countries altogether around 300 million days were spent in a hospital, of which 53 million were used by people in good health, 96 million by people in fair and 150 million by people in bad health. In the baseline scenario the number of bed days will increase by 27% in the EU and 28% in the participating countries combined by 2050 (Tables A31–A33). Thus, the development of bed days shows higher potential increases than the increase of hospital admissions. The number of bed days used by people in bad health will increase by 35% in the EU and 36% in the participating countries altogether.

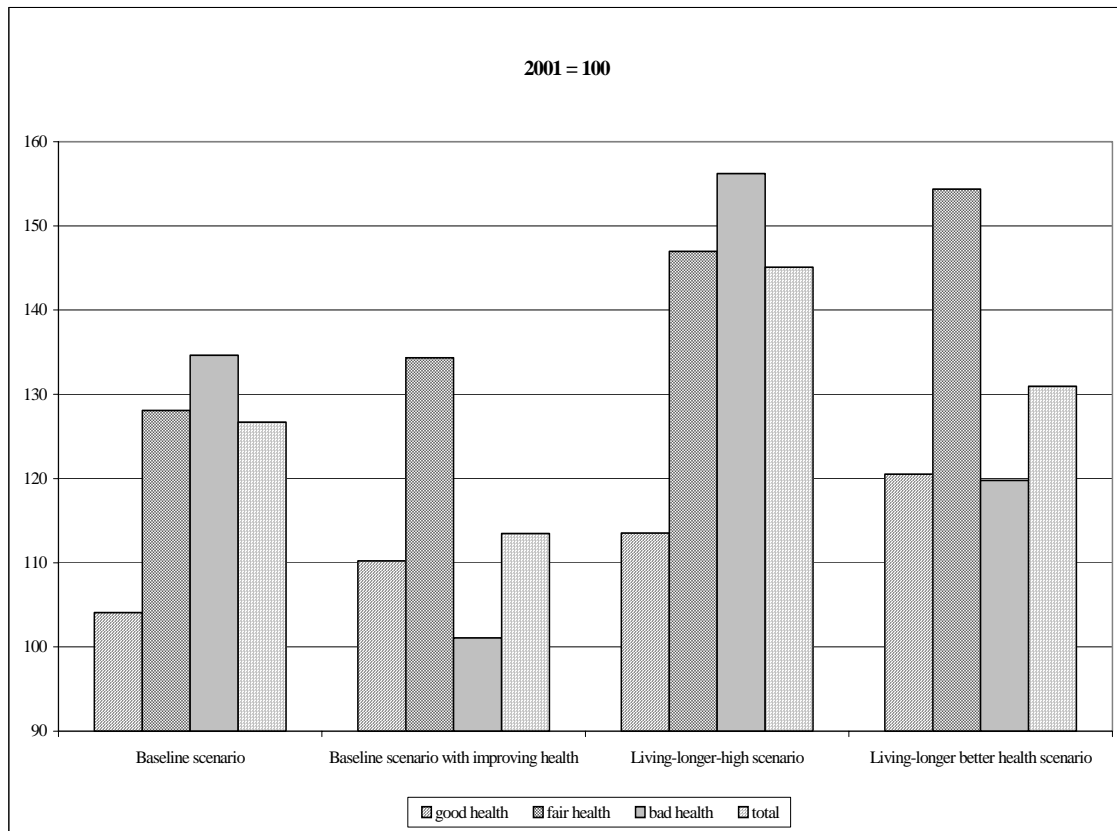
A higher life expectancy leads to a higher growth rate of bed days than in the baseline scenario. The number of bed days increases by 45% by 2050 in the EU and 48% in the participating countries combined; and for people in bad health is the increase 56% and 60% respectively in the baseline and living-longer high scenarios. Improvements in health status lead to a lower growth rate of hospital bed days. In the living longer in better health scenario the number of bed days increases by 31% in the EU and by 25% in the participating countries altogether by 2050. Thus, in the EU on average the increase is only a little bit higher than in the baseline scenario and for the participating countries altogether a little bit lower. But these differences are not great and have to be interpreted with caution. As a result it could be held that in the baseline scenario an increase of total bed days of around one-quarter can be expected by 2050 and that further improvements in health are able to nearly compensate for the effect of additional life expectancies (Table 3.4 and Figure 3.2).

*Table 3.4 Hospital bed days by health status in 2050 in participating countries and the EU<sup>1)</sup> (2001 = 100)*

Health status	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK	All	EU <sup>1)</sup>
Baseline scenario										
good	121	119	102	114	88	119	103	126	105	104
fair	135	134	130	141	113	142	129	144	128	128
bad	131	135	149	140	132	138	144	142	136	135
total	130	130	132	137	120	135	132	138	128	127
Baseline scenario with improving health										
good	128	126	108	126	99	125	112	136	115	110
fair	139	133	132	149	124	146	135	151	136	134
bad	62	93	101	64	95	58	105	78	87	101
total	110	114	116	105	104	111	114	114	107	113
Living-longer-high scenario										
good	138	133	111	123	92	130	114	145	115	114
fair	158	159	151	160	129	167	148	173	147	147
bad	155	159	180	157	157	157	168	169	160	156
total	152	152	155	154	139	154	152	164	148	145
Living-longer better health scenario										
good	147	142	117	137	105	137	124	157	127	121
fair	163	156	155	169	141	172	155	181	156	154
bad	76	113	128	74	115	68	124	94	104	120
total	130	134	138	119	121	128	133	136	125	131
1) EU (15) without Luxembourg and Sweden; people aged 15+.										
Source: Projections by DIW.										



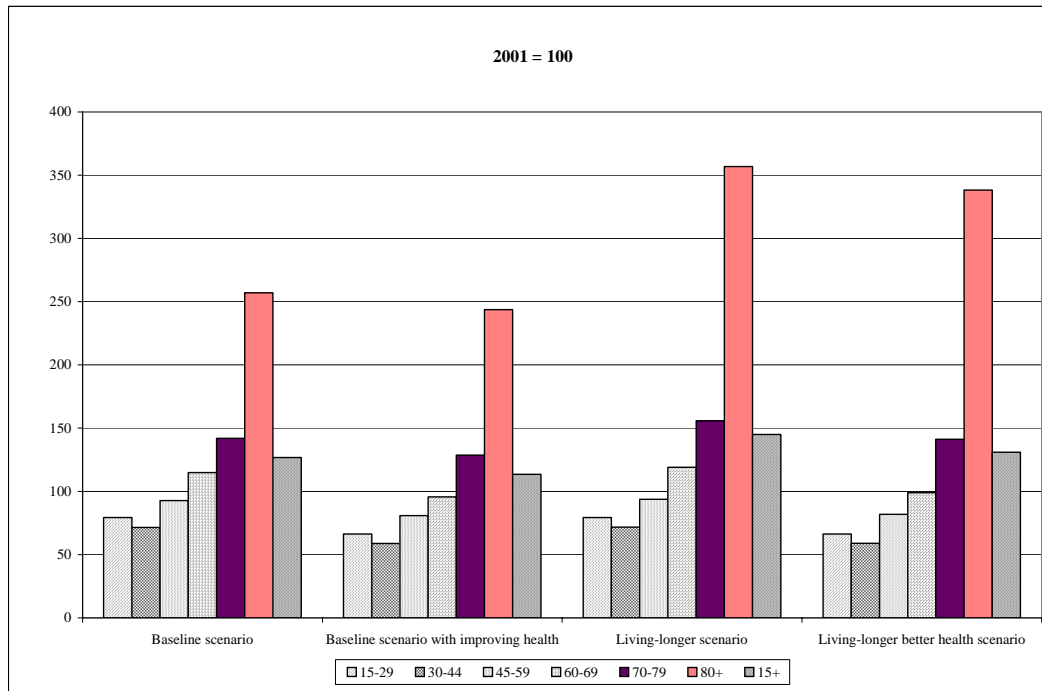
Figure 3.2 Hospital bed days by health status in the EU<sup>1)</sup> (2050)



1) EU (15) without Luxembourg or Sweden; people aged 15+.

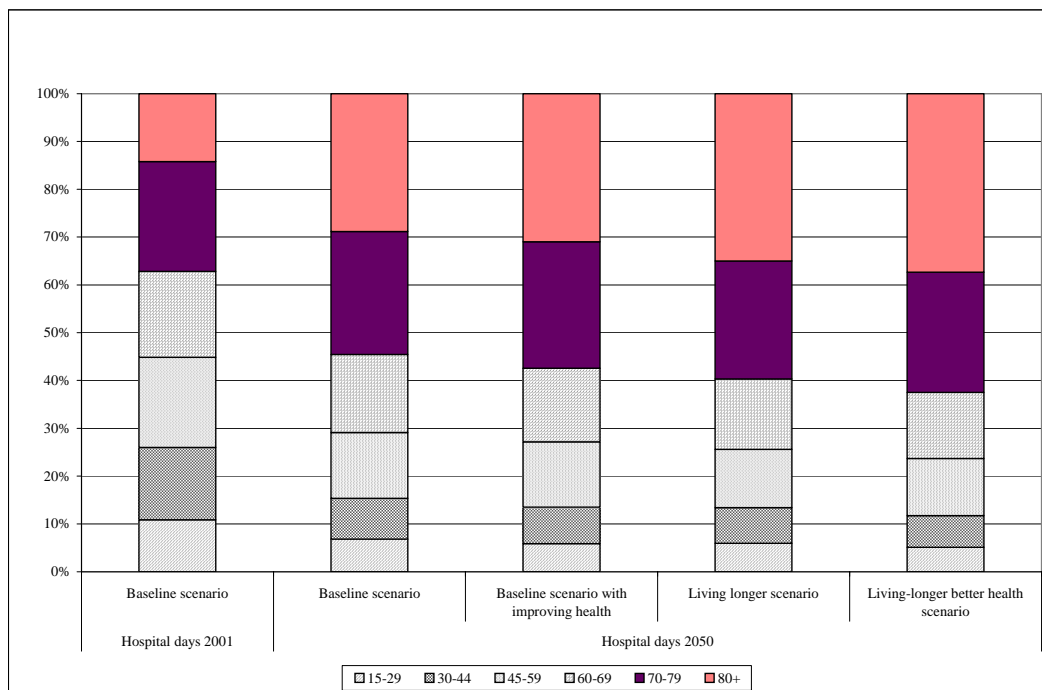
The development of hospital bed days is different in the single age groups. As an example, the development in the EU is shown in Figure 3.3. In the age groups 15-29, 30-44 and 45-59 the number of bed days decreases between 2001 and 2050 in all four scenarios. The age group 60-69 will experience an increase in the scenarios without improvements in health status, but if improvements in health status are taken into account there will be no changes (living longer in better health scenario) and a small decrease (baseline scenario with improving health) can be observed. And the older age groups show an increase in all scenarios. The highest increase in hospital utilisation can be expected for people aged 80+. Therefore, the age structure of hospitalised people will change between 2001 and 2050. In 2001 around 14% of hospital bed days are required for people aged 80+; in 2050 between 29% (baseline scenario) and 37% (living longer in better health scenario) will be required for the oldest old (Figure 3.4).

Figure 3.3 Hospital bed days by age groups in the EU<sup>1)</sup> (2050)



1) EU (15) without Luxembourg and Sweden; three-year-averages 1999-2001.

Figure 3.4 Age structure of hospital days in the EU<sup>1)</sup>



1) EU (15) without Luxembourg and Sweden; three-year-averages 1999-2001.

### 3.2 Contacts with a general practitioner

Along with variables concerning hospital utilisation, the ECHP includes variables regarding outpatient utilisation. One question was “During the last 12 months, about how many times have you consulted a general practitioner?”. The ECHP also asked about medical specialist consultations and dentist consultations. To show the effect of the different demographic and health care scenarios, the consultations with a general practitioner were used as an example. No data exist for France or Germany. To include these two countries in the forecast, however, the average mean value of the contacts in the EU is used.

*Table 3.5 Mean value of contacts with a general practitioner within one year by health status in participating countries and the EU<sup>1)</sup>*

Age-groups	Belgium	Denmark	Finland	France <sup>2)</sup>	Germany <sup>2)</sup>	Netherlands	Spain	UK	EU <sup>1)</sup>
People in good/very good health									
15-29	2,8	2,4	1,9	1,7	1,7	1,8	1,7	2,3	1,7
30-44	2,5	1,8	1,7	1,8	1,8	1,8	1,7	1,9	1,8
45-59	3,1	1,6	1,4	2,1	2,1	1,6	2,2	1,9	2,1
60-69	4,4	2,2	1,4	3,0	3,0	2,2	3,4	2,6	3,0
70-79	6,2	2,6	1,3	3,7	3,7	2,6	4,1	2,9	3,7
80+	7,8	3,0	1,0	4,3	4,3	2,9	4,7	3,0	4,3
Total	3,2	2,0	1,6	-	-	1,8	2,1	2,2	2,1
People in fair health									
15-29	5,5	5,9	3,9	3,9	3,9	5,1	4,8	3,5	3,9
30-44	5,8	4,3	3,0	4,0	4,0	4,8	4,3	3,5	4,0
45-59	7,1	4,1	2,7	4,3	4,3	4,2	5,3	3,8	4,3
60-69	9,6	4,4	2,3	5,4	5,4	4,9	6,5	4,5	5,4
70-79	10,3	5,1	2,3	6,1	6,1	5,3	6,8	4,5	6,1
80+	10,8	5,7	2,8	6,3	6,3	5,2	6,9	4,4	6,3
Total	8,1	4,6	2,7	-	-	4,8	5,8	3,8	4,8
People in bad/very bad health									
15-29	5,3	10,3	5,2	7,3	7,3	7,7	8,1	5,8	7,3
30-44	12,0	9,9	6,5	7,8	7,8	8,2	9,6	6,1	7,8
45-59	14,6	9,0	4,9	8,6	8,6	8,1	10,2	6,3	8,6
60-69	18,5	8,3	4,0	9,6	9,6	8,5	10,7	6,4	9,6
70-79	19,2	7,3	4,3	9,9	9,9	10,4	10,8	6,3	9,9
80+	14,1	8,2	14,2	9,2	9,2	8,7	9,7	5,5	9,2
Total	15,6	8,6	5,7	-	-	8,6	10,3	6,1	8,7

1) EU (15) without Luxembourg, Sweden, France and Germany; three-year-averages 1999-2001.- 2) EU-average.  
Source: ECHP wave 6-8.

On average people consulted a doctor 3.4 times a year in the EU (average 1999-2001). People in good health visit a general practitioner 2.1 times, people in fair health 4.8 times and people in bad health 8.7 times a year (Table 3.5). At a given health status the number of contacts increases with age. People in bad health age 60+ have contact with a general practitioner on average 10 times a year (EU). The differences among the countries depend on the health care system besides other factors. In several countries general practitioners act as gatekeepers for specialists and hospital admissions. Therefore, in this part the focus lies on the development in the countries and the differences among the four demographic and health scenarios and not on the analysis of differences among countries.

To obtain the total number of contacts with a general practitioner in the EU, the mean value of contacts with a general practitioner in the EU without Luxembourg, Sweden, France or Germany was multiplied by the population aged 15+ in the EU without Luxembourg or Sweden. Thus, the average mean value of contacts in the EU is also applied to France and Germany.

*Table 3.6 Contacts with general practitioner by health status in 2050 in participating countries and the EU<sup>1)</sup> (2001 = 100)*

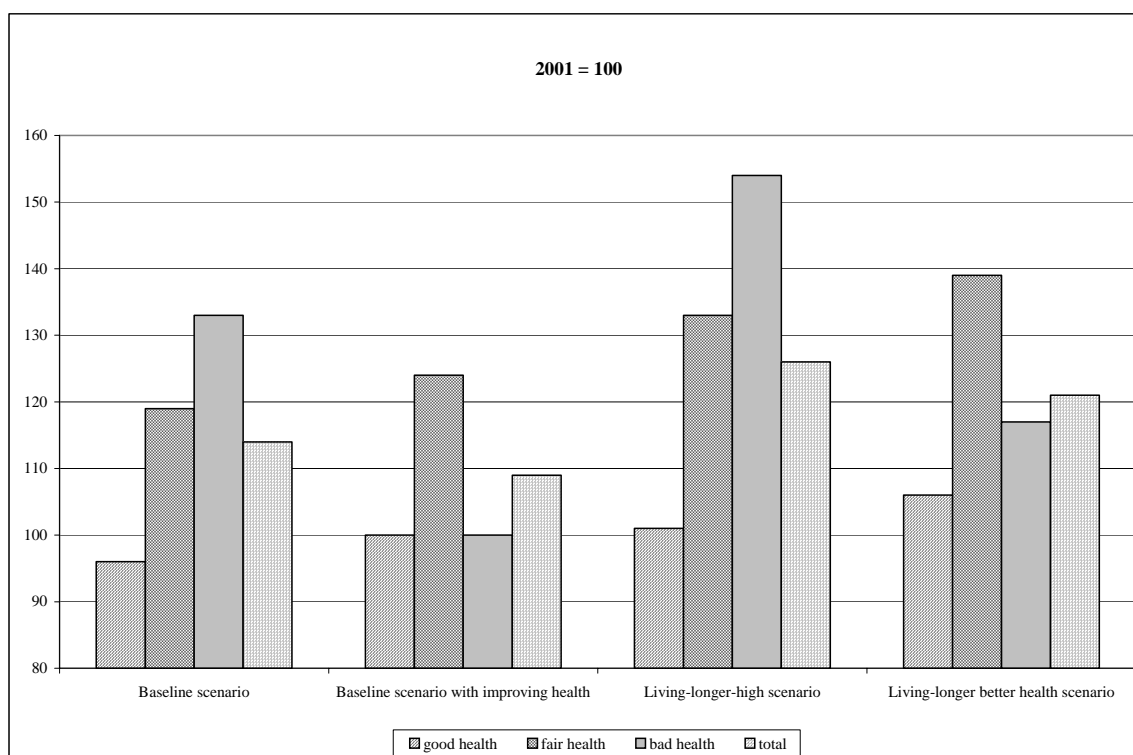
Health status	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK	All	EU <sup>1)</sup>
Baseline scenario										
good	104	106	87	104	86	109	88	107	98	96
fair	126	123	110	128	106	129	123	118	117	119
bad	128	130	176	138	119	130	138	119	126	133
total	115	115	111	122	107	120	113	113	113	114
Baseline scenario with improving health										
good	109	110	90	114	97	114	94	114	106	100
fair	129	122	110	134	114	131	128	123	124	124
bad	58	86	137	59	82	55	99	63	78	100
total	109	109	106	112	98	112	107	107	105	109
Living-longer-high scenario										
good	112	111	88	109	90	116	94	114	104	101
fair	143	139	122	141	117	146	138	130	130	133
bad	148	152	229	154	137	148	159	131	144	154
total	128	127	126	133	119	132	126	122	125	126
Living-longer better health scenario										
good	118	116	92	120	102	121	101	122	113	106
fair	148	138	122	148	127	149	144	135	138	139
bad	70	104	183	69	97	64	116	70	92	117
total	121	120	119	123	110	123	119	116	116	121

1) EU (15) without Luxembourg and Sweden; people aged 15+.

Source: Projections by DIW.

Under this assumption general practitioners received around 1.074 million contacts in the EU in 2001, among which 410 million were from people in good health, 378 million were from people in fair health and 286 million were from people in bad health. In the baseline scenario the number of contacts will increase 14% by 2050. Whereas the number of contacts of people in good health will be less than in 2001, the number of contacts of people in bad health will increase by 33% (Tables A34-A36). If the life expectancy increases by around five additional years, the number of contacts increases 26% and for people in bad health 54% by 2050. Improvements in health status counteract these developments, but the rise in the living longer in better health scenario is higher than in the baseline scenario (Table 3.6 and Figure 3.5). Thus, improvements in health status can not compensate for the effect of a higher life expectancy (given the underlying assumptions).

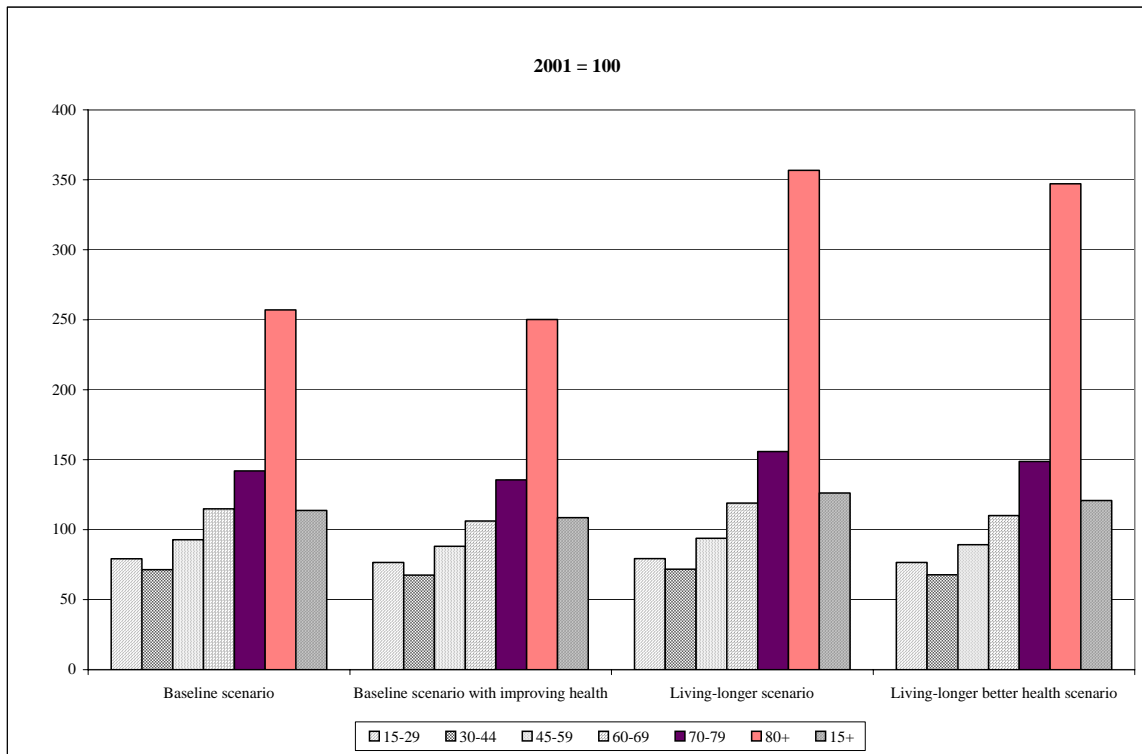
Figure 3.5 Contacts with a general practitioner by health status in the EU<sup>1)</sup> (2050)



1) EU (15) without Luxembourg and Sweden; three-year-averages 1999-2001.

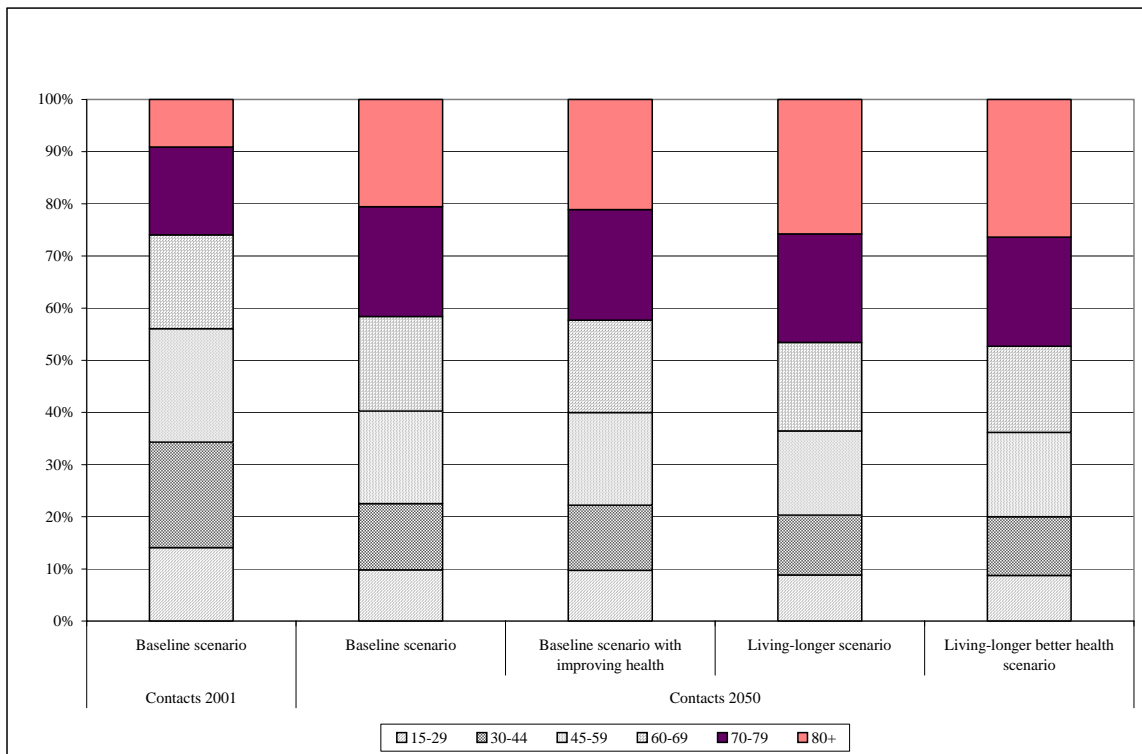
Great differences in the development of contacts with a general practitioner between the age groups can be observed. The number of contacts of people under age 60 decreases in all scenarios, whereas the number of contacts of people aged 60+ increases. As in the case of hospital bed days, the highest increase could be expected for people aged 80+ (Figure 3.6). In 2001, 9% of contacts with a general practitioner were required by people aged 80+. In 2050, between 21% (baseline scenario) and 26% (living longer in better health scenario) of contacts with a general practitioner will be required for people aged 80+ (Figure 3.7).

Figure 3.6 Contacts with a general practitioner by age group in the EU<sup>1)</sup> (2050)



1) EU (15) without Luxembourg and Sweden; three-year-averages 1999-2001.

Figure 3.7 Age structure of contacts with a general practitioner in the EU<sup>1)</sup>



1) EU (15) without Luxembourg and Sweden; three-year-averages 1999-2001.

### 3.3 Severely hampered persons

To obtain an idea about the extent for the need of long-term care at home, data concerning disability from the ECHP were used. Three questions are directly relevant: “Do you have any chronic physical or mental health problem, illness or disability?” (yes/no/missing); “Are you hampered in your daily activities by this physical or mental health problem, illness or disability?” (yes, severely/yes, to some extent/no/missing/not applicable); “During the past two weeks, have you had to cut down things you usually do about house, at work or in free time because of illness or injury?” (yes/no/missing). Jacobzone (1998) pointed out that severe disability is a good proxy for the need for long-term care. Therefore, the number of persons who are severely hampered in daily activities were used as a soft proxy for the number of persons with a potential need for long-term care at home. In total, 8% of all persons reported that they were severely hampered in daily activities in 2001 (EU countries without Luxembourg). The share of the severely hampered persons increases with age. Around 13% of persons aged 60-69, 20% of persons aged 70-79 and 30% of persons aged 80+ were reported to be severely hampered.

Among the participating countries the share and the development between 1994 and 2001 of the number of severely hampered persons was different (Table 3.7). The share of severely hampered persons was lowest in Belgium (around 5%) and highest in France (10%) in 2001. The data for the UK are not fully compatible, because in waves 1 to 5 (years 1994 to 1998) and in waves 7 and 8 (years 2000 and 2001) the response item “to some extent hampered” was combined with the item “severely hampered”. Only for 1999 are the UK data fully comparable, and show that around 6% were severely hampered.

Table 3.8 shows the proportion of severely hampered persons in the single participating countries by health status as a three-year average of 1999-2001. As expected, the share of severely hampered persons increases sharply if the health status deteriorates. The highest share of hampered persons can be observed in the Netherlands, where three out of four people in bad health were reported to be severely hampered in their daily activities.

The share of persons severely hampered by chronic illness is noticeably higher than the share of people who receive long-term care at home (data from national sources – see chapter 2). In France, for example, 10% were reported as severely hampered by chronic illness or disability, but only 0.6% received professional care at home. In Germany, around 8% were reported as severely hampered by chronic illness, but only 1.8% receive long-term care at home by informal or professional care-givers.

To select those who need help from others among the severely hampered persons an additional question from the ECHP was used. The ECHP asked if the severely hampered person has had to cut down things they usually do as a consequence of a chronic illness or disability. Table 3.9 shows the results of the ECHP for the three-year average 1999-2001. A large share of severely hampered persons has had to cut down things they usually do, with the exception of France. In France only one out of three hampered persons have had to cut down things. Utilising both pieces of information leads to a new approach with the data for analysing long-term care-giving at home. If

10% were reported as severely hampered and around one-third of them have had to cut down things, it could be expected that around 3% of the French population will need help with housework or personal help. But the ECHP provides no information on the degree to which help is needed. Therefore, the 3% can only be the upper limit of people in need of help. In the younger and middle age groups in particular the degree to which help is needed will be low, and in these age groups help from other members of the family or the partner is common. Thus, the results of the ECHP have to be interpreted with caution and they seem to show the upper limit of the need for help.

*Table 3.7 Severely hampered persons by age group in participating countries (1994-2001)*

Age-groups	Share of in daily activities severely hampered persons by chronic illness															
	1994	1995	1996	1997	1998	1999	2000	2001	1994	1995	1996	1997	1998	1999	2000	2001
	Belgium								Germany							
0 - 29	1,4	1,0	1,3	0,8	1,3	0,7	0,6	0,5	1,8	2,0	1,7	1,5	1,6	1,7	1,4	
30 - 44	3,0	2,5	2,4	2,0	2,5	2,2	2,2	2,7	3,4	3,5	2,9	3,5	2,8	2,7	3,0	
45 - 59	6,6	6,7	6,1	5,5	6,2	5,0	4,6	4,6	9,9	10,2	10,7	10,2	10,9	9,7	10,6	
60 - 69	11,8	10,4	10,7	7,3	8,1	6,9	7,0	6,9	15,0	15,7	14,5	14,9	15,0	14,9	14,2	
70 - 79	15,7	15,5	15,9	14,4	20,1	15,8	14,3	14,9	25,6	24,0	23,5	25,1	23,8	21,2	23,3	
80 +	30,4	27,3	27,6	21,1	23,1	18,9	17,6	21,6	38,4	41,0	33,2	41,3	44,2	37,9	41,0	
Total	6,6	6,1	6,1	4,9	6,1	5,1	4,8	5,3	7,9	8,2	7,8	8,2	8,3	7,8	8,5	
	Denmark								Netherlands							
0 - 29	1,5	1,3	1,2	1,4	1,1	2,0	1,6	1,8	1,7	2,2	2,1	2,1	2,0	2,8	3,0	3,3
30 - 44	1,6	2,7	2,1	1,9	2,6	2,5	2,8	2,6	3,8	4,7	4,1	4,6	4,4	4,4	4,5	4,7
45 - 59	5,4	5,8	6,0	5,9	5,6	5,0	5,6	5,6	6,8	8,2	8,2	8,0	7,9	8,3	9,2	9,4
60 - 69	8,9	12,7	10,9	10,0	10,4	8,9	9,4	10,8	12,1	10,4	12,1	11,4	12,7	10,3	11,6	11,7
70 - 79	15,3	14,1	18,2	18,0	18,2	17,9	20,5	13,8	17,6	15,8	15,9	18,5	17,7	16,7	17,2	16,1
80 +	20,8	21,6	24,9	22,9	24,5	23,3	27,8	29,6	25,5	21,9	26,7	21,1	25,1	20,3	26,2	27,4
Total	5,4	5,9	6,0	5,8	5,9	5,6	6,3	6,1	6,6	6,9	7,0	7,2	7,3	7,3	8,0	8,2
	Finland								Spain							
0 - 29			1,6	1,5	1,9	1,4	1,5	0,9	1,0	0,8	0,8	0,9	1,1	1,0	0,9	1,1
30 - 44			2,3	2,3	2,2	2,8	3,1	2,6	2,4	2,2	2,2	2,1	2,2	2,1	2,4	2,2
45 - 59			8,9	8,3	7,7	7,4	7,8	7,4	6,9	6,7	5,2	6,4	5,3	4,9	5,2	4,9
60 - 69			18,4	15,6	15,2	14,8	14,4	14,8	12,2	12,7	10,5	11,8	10,3	9,6	10,1	11,0
70 - 79			31,1	27,2	23,8	22,7	20,8	21,8	15,4	16,0	13,5	12,9	15,1	13,2	12,8	14,4
80 +			54,4	48,7	40,8	43,9	46,1	45,0	30,1	27,8	24,5	24,5	27,8	23,8	24,7	24,8
Total			8,4	7,6	7,1	7,2	7,2	7,0	6,6	6,5	5,6	5,9	6,0	5,5	5,7	6,1
	France								UK *							
0 - 29	3,2	2,2	2,1	2,3	2,3	2,4	3,0	2,7	4,8	3,6	3,8	4,1	3,5	0,7	4,0	4,6
30 - 44	4,9	4,4	4,7	4,6	4,7	4,7	4,1	4,2	8,5	6,8	7,1	7,6	7,4	2,0	8,4	9,2
45 - 59	10,4	9,2	9,2	10,2	10,5	9,6	9,8	10,1	15,9	14,5	15,3	16,5	15,3	5,2	15,2	16,0
60 - 69	19,4	17,2	17,7	17,3	18,4	16,5	15,8	15,7	24,5	20,4	19,5	22,4	21,1	8,7	23,1	22,8
70 - 79	23,5	25,4	23,1	25,7	27,5	27,1	28,6	27,9	29,6	24,6	25,9	27,6	27,4	16,9	29,2	30,9
80 +	36,2	40,7	38,8	42,7	41,2	40,3	33,4	34,5	44,0	41,2	40,8	44,0	44,1	35,7	42,9	43,9
Total	10,2	9,5	9,3	9,9	10,6	10,2	10,1	10,2	14,1	12,1	12,4	13,5	12,9	5,8	13,8	14,6

\*) Response category severely together with to some extent in wave 1-5 and wave 7-8.

Sources: ECHP; projections by DIW.



*Table 3.8 Proportion of persons severely hampered by chronic illness or disability by health status in participating countries and the EU<sup>1)</sup>*

Age-groups	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK <sup>2)</sup>	EU <sup>1)</sup>
good/very good health									
15-29	0,2	0,5	0,2	0,7	0,4	0,7	0,3	1,2	0,5
30-44	0,5	0,5	0,4	0,9	0,1	0,7	0,3	1,6	0,6
45-59	0,8	0,4	0,4	1,1	0,3	1,3	0,7	3,0	1,1
60-69	0,8	1,3	1,1	1,3	0,6	1,6	0,8	5,4	1,9
70-79	2,2	2,2	4,3	3,5	1,0	3,1	0,8	7,9	3,4
80+	6,4	6,4	5,3	5,4	9,4	4,8	2,2	19,2	9,5
Total	0,7	0,8	0,5	1,1	0,3	1,1	0,5	3,1	1,0
fair health									
15-29	4,3	7,3	2,3	5,5	2,2	12,6	4,2	4,0	5,1
30-44	6,0	7,2	6,3	5,8	1,3	11,9	5,5	9,2	6,1
45-59	6,9	9,3	8,8	10,9	3,1	16,8	4,4	16,1	9,2
60-69	10,4	11,4	13,7	14,6	4,3	14,3	6,4	24,2	9,9
70-79	13,1	14,7	13,2	23,3	7,1	17,4	5,0	29,7	12,4
80+	21,4	22,1	23,6	28,5	12,2	23,3	10,3	46,1	19,9
Total	9,5	10,9	10,0	12,8	3,4	15,4	5,7	15,9	9,5
bad/very bad health									
15-29	15,8	50,0	48,3	48,3	18,1	60,5	36,6	18,7	39,2
30-44	42,7	50,5	58,8	50,6	25,5	73,6	41,0	33,7	46,2
45-59	50,0	54,3	60,9	65,6	41,6	74,3	36,2	43,6	51,3
60-69	52,7	63,7	59,2	74,4	44,7	77,0	35,3	47,0	48,4
70-79	65,4	68,6	72,8	78,4	55,5	78,1	38,7	56,5	52,2
80+	49,4	75,0	82,7	80,5	71,5	84,9	56,0	69,5	61,0
Total	52,3	61,2	64,5	68,7	41,9	75,2	40,4	42,7	51,0

1) EU (15) without Luxembourg and Sweden; three-year-averages 1999-2001.- 2) Severely and to some extent in 2000 and 2001.  
Source: ECHP wave 6-8.

*Table 3.9 Proportion of severely hampered persons who have had to cut down things they usually do among severely hampered persons in participating countries and the EU<sup>1)</sup>*

Age-groups	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK <sup>2)</sup>	EU <sup>1)</sup>
People in good/very good/fair/bad/very bad health together									
15-29	31,3	68,2	66,0	23,2	-	56,3	38,5	34,8	42,2
30-44	53,3	71,0	78,0	26,8	-	72,1	42,9	50,5	54,4
45-59	55,1	70,7	78,5	33,6	-	60,7	49,9	63,3	59,0
60-69	49,1	59,7	78,9	36,3	-	62,0	51,9	69,4	55,6
70-79	46,9	63,3	75,7	36,8	-	56,8	56,4	77,6	58,3
80+	47,7	63,6	79,6	35,4	-	47,7	54,4	82,4	58,3
Total	49,8	65,8	77,7	33,8	-	60,8	51,7	78,9	56,7

1) EU (15) without Luxembourg and Sweden; three-year-averages 1999-2001.- 2) Severely and to some extent in 2000 and 2001.  
Source: ECHP wave 6-8.

In the EU around 25 million people were reported to be severely hampered in 2001, of which 2 million were in good health, 7 million were in fair health and 16 million were in bad health. For the participating countries altogether the figures are 20 million in total, of which 1.8 million were in good, 6 million were in fair and 12.5 million were in bad health. In the EU among the severely hampered persons around 14.5 million have had to cut down things they usually do. This figure cannot be subdivided by health status, because the sample size is not large enough to calculate representative proportions of people who have had to cut down things by health status. Also a calculation as a three-year average does not lead to a representative result. Another problem is that this question has not been asked for Germany. In any case, to obtain an idea of the development of people who have had to cut down things in Germany the EU average is used.

Owing to this restriction the following tables include the development of severely hampered persons for the four scenarios differentiated by health status and the development of severely hampered persons who have had to cut down things in total. In the *baseline scenario* the number of severely hampered persons will increase up to 34 million in the EU and up to 28 million in the participating countries altogether in 2050 (Tables A37-A39). This is an increase of 33% in the EU and 37% in the participating countries altogether. The growth is highest for France and lowest for the Netherlands (Table 3.10).

The increase in the number of severely hampered persons is higher than the increase of hospital bed days or the increase of contacts with a general practitioner, but the margin of differences in the changes in percentages by health status is not as broad as in the case of hospital utilisation or contacts with a general practitioner. The number of severely hampered persons in bad health increases by 36% by 2050 in the EU (baseline scenario). The figure for people in fair health is 30% and for people in good health 23%.

In the participating countries altogether the increase of people in bad and in fair health is nearly the same (37% and 39% respectively) and is higher than the increase of severely hampered persons in good health (30%). A higher life expectancy leads to a more dynamic development (living-longer high scenario). The number of severely hampered persons increases by 55% in the EU and 60% in the participating countries altogether and the differences by the health status are nearly the same as in the baseline scenario (relative).

*Table 3.10 Persons severely hampered by chronic illness or disability by health status in 2050 in participating countries and the EU<sup>1)</sup> (2001 = 100)*

Health status	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK <sup>2)</sup>	All	EU <sup>1)</sup>
Baseline scenario										
good	131	129	116	115	131	123	98	137	130	123
fair	140	134	131	146	130	134	127	141	139	130
bad	129	139	150	142	134	130	146	132	137	136
total	133	137	141	142	134	131	139	137	137	133
cut down <sup>3)</sup>	132	135	141	145	135	127	144	145	140	135
Baseline scenario with improving health										
good	140	139	124	127	155	129	106	149	142	132
fair	145	133	135	155	143	137	133	147	147	136
bad	59	96	106	63	98	55	107	72	86	103
total	103	112	120	106	106	99	113	118	109	115
cut down <sup>3)</sup>	101	110	120	109	107	95	117	126	113	116
Living-longer-high scenario										
good	155	152	129	125	158	138	108	161	150	141
fair	166	159	152	167	153	156	147	165	162	150
bad	149	167	185	160	160	149	174	153	160	159
total	156	163	168	160	159	151	164	159	160	155
cut down <sup>3)</sup>	154	161	169	165	161	143	170	173	165	157
Living-longer better health scenario										
good	166	164	139	139	190	145	117	176	165	152
fair	172	157	157	177	169	160	154	173	171	157
bad	71	119	135	73	120	65	130	84	103	123
total	122	135	145	121	128	116	134	138	129	135
cut down <sup>3)</sup>	120	133	146	126	130	108	140	151	135	137

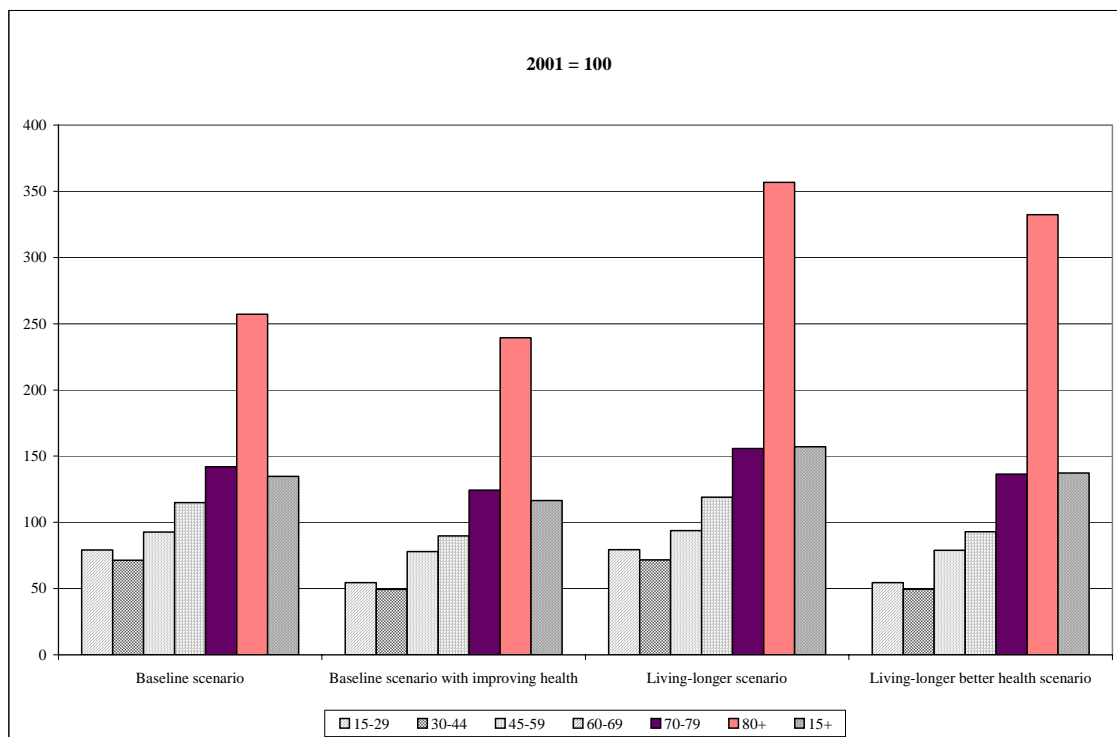
1) EU (15) without Luxembourg and Sweden; people aged 15+.- 2) Severely and to some extent hampered.- 3) Severely hampered persons who have to cut down things they usually do due to chronic illness or disability (all health status together).  
Source: Projections by DIW.

Improvements in health change the development in a single health status markedly. In the baseline scenario, with improvements in health the overall development by 2050 in the EU is 15%, but the increase of severely hampered persons in bad health is only 3%, in fair health 36% and in good health 32%. Improvements in health lead to a higher proportion of people in fair and good health and therefore to a moderate increase of severely hampered people in bad health. The same effect can be observed for the living longer in better health scenario. Whereas the increase of severely hampered persons in

bad health in the living-longer scenario is around 60% (by 2050 in the EU and also in the participating countries altogether), improvements in health status notably reduces the increase down to 23% in the EU and 3% in the participating countries. Simultaneously, the increase of people in fair and good health is much higher: 57% (71%) for people in fair health and 52% (65%) for people in good health in the EU (and the participating countries). In total the improvements in health status compensate for the effect of increasing life expectancy, but in a single health status improving health has a greater effect.

The development of severely hampered persons who will have to cut down things they usually do is similar to the overall development of severely hampered persons in the four scenarios, but the dynamic shows a decline for the younger age groups (Figure 3.8).

Figure 3.8 Severely hampered persons who will have to cut down things they usually do by age group in the EU<sup>1)</sup> (2050)

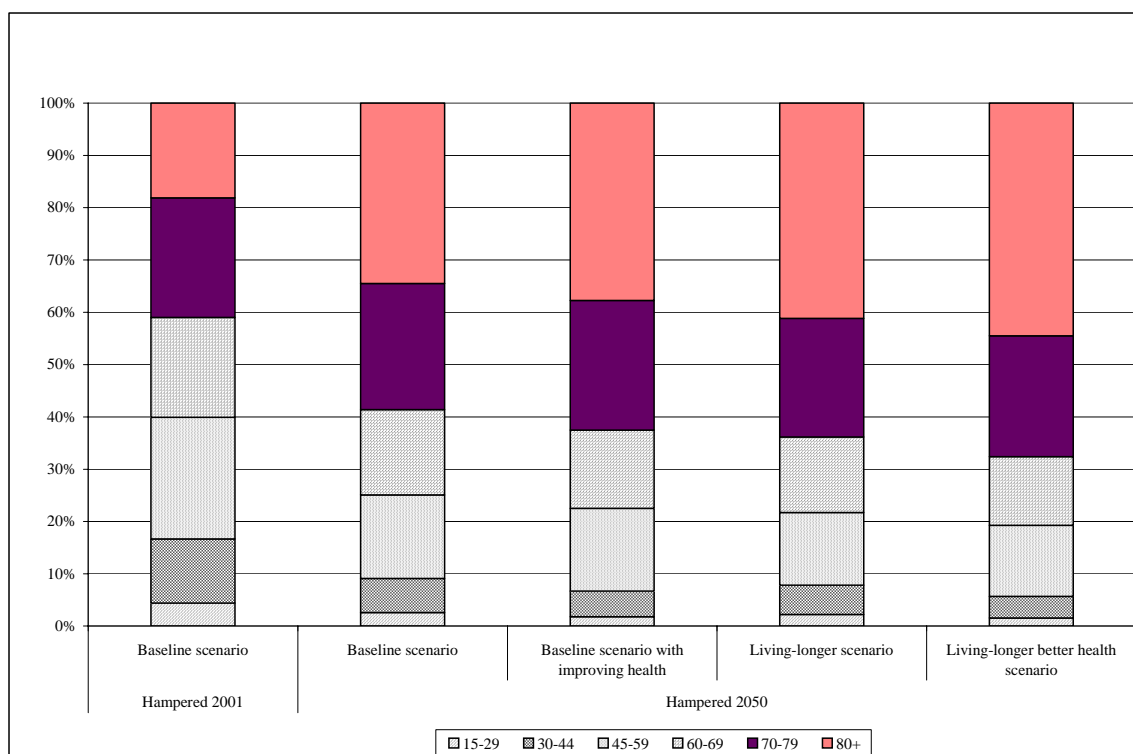


1) EU (15) without Luxembourg and Sweden; three-year-averages 1999-2001.

As in the case of formal long-term care-giving (chapter 2), the development shows a high increase in the oldest age group (Figure 3.9). While the number of hampered persons who will have to cut down things they usually do in the younger age groups (15-59) will decline, the number of severely hampered persons who will have to cut down things aged 80+ will increase by two and a half times in the baseline and baseline improving-health scenarios and will increase by around three and a half times in both of the living-longer scenarios.

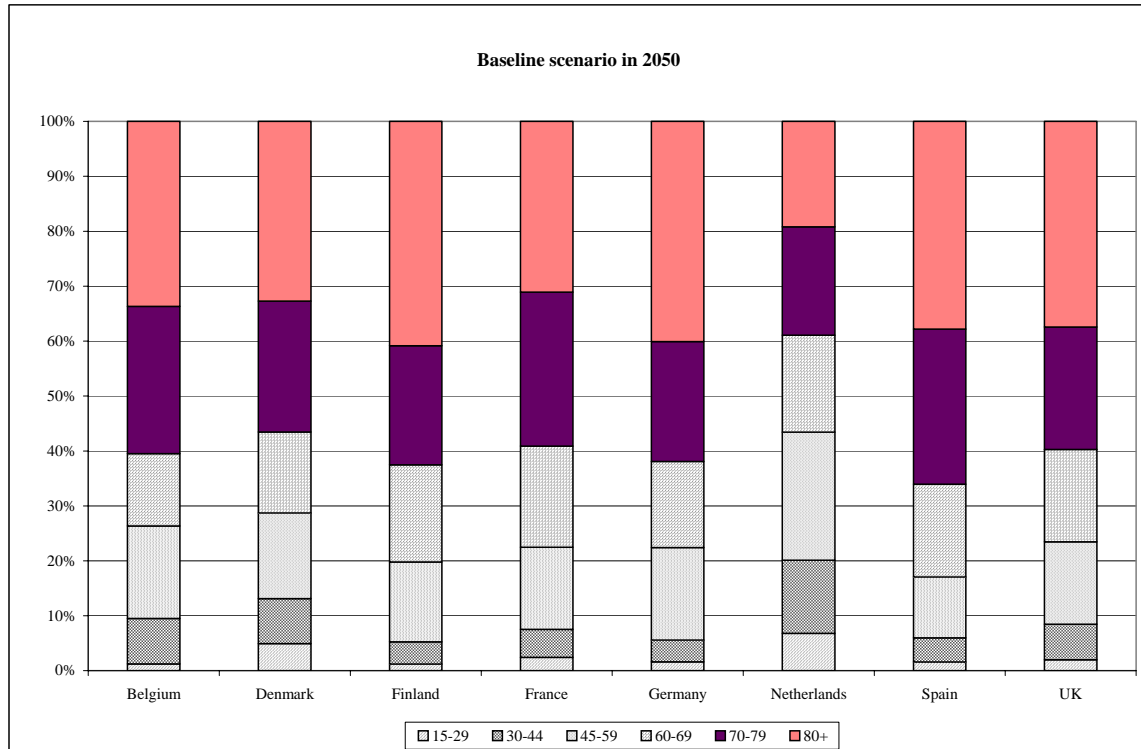
Therefore, the age structure of severely hampered persons who will have to cut down things is expected to change. The proportion of people aged 80+ in this group was 18% in 2001 in the EU (Figure 3.8). By 2050, this share will increase up to 35% in the baseline scenarios and up to 45% in the living longer in better health scenario, but with great differences among the countries. In the Netherlands only 19% of severely hampered people will be aged 80+ in 2050, whereas in Finland the proportion among the oldest old will be 41% (baseline scenario – Figure 3.10).

*Figure 3.9 Age structure of severely hampered persons who have to cut down things they usually do in the EU<sup>1)</sup>*



1) EU (15) without Luxembourg and Sweden; three-year-averages 1999-2001.

Figure 3.10 Age structure of severely hampered persons who will have to cut down things they usually do (baseline scenario 2006)



### 3.4 Summary

In chapter 3 data from the ECHP were used to show the effects of living longer in better health on hospital utilisation, contacts with a general practitioner and the number of severely hampered persons as a soft proxy for the need for long-term care at home. The four demographic and health scenarios, namely the baseline scenario, the baseline scenario with improving health, the living-longer high scenario and the living longer in better health scenario, were combined with the three-year averages of utilisation data. The forecast of hospital admissions, hospital bed days, contacts with a general practitioner and severely hampered persons could be carried out for persons aged 15+. The results for the different data sources of utilisation are thus not completely comparable with the results in chapter 2, but they allow a picture of the development by health status, which is a new approach to forecasting health care utilisation and may also be a step forward in the discussion of the development of health care expenditures.

The population aged 15+ decreases in the baseline scenario in three countries (Finland, Germany and Spain) and in the living-longer scenario in one country (Spain), but the number of hospital admissions, hospital bed days, contacts with a general practitioner and severely hampered persons increases in all countries by 2050. The countries with declining populations show no general lower development in utilisation than the others (Table 3.11). The highest change is expected for the number of hospital bed days and

the number of severely hampered persons – 21% and 33% respectively on average in the EU between 2001 and 2050 (baseline scenario) – whereas for the number of admissions and contacts with a doctor a more moderate increase is estimated (14% in the baseline scenario).

*Table 3.11 Development of the population aged 15+, health care utilisation and severely hampered persons in 2050 (2001 = 100)*

Countries	Baseline scenario					Living-longer-high scenario				
	Population 15+	Hospital admissions	Hospital days	Contacts with a GP <sup>1)</sup>	Hampered persons <sup>2)</sup>	Population 15+	Hospital admissions	Hospital days	Contacts with a GP <sup>1)</sup>	Hampered persons <sup>2)</sup>
constant health										
Belgium	101	119	130	115	132	107	134	152	128	154
Denmark	107	120	130	115	135	114	135	152	127	161
Finland	99	113	132	111	141	105	126	155	126	169
France	108	124	137	122	145	114	136	154	133	165
Germany	94	108	120	107	135	101	121	139	119	161
Netherlands	111	123	135	120	127	119	137	154	132	143
Spain	91	117	132	113	144	98	131	152	126	170
United Kingdom	107	117	138	113	145	115	130	164	122	173
All	101	115	128	113	140	108	128	148	125	165
EU (15) <sup>3)</sup>	99	114	127	114	135	106	128	145	126	157
improving health										
Belgium	101	108	110	109	101	107	122	130	121	120
Denmark	107	112	114	109	110	114	126	134	120	133
Finland	99	108	116	106	120	105	121	138	119	146
France	108	108	105	112	109	114	119	119	123	126
Germany	94	99	104	98	107	101	112	121	110	130
Netherlands	111	112	111	112	95	119	125	128	123	108
Spain	91	107	114	107	117	98	121	133	119	140
United Kingdom	107	105	114	107	126	115	117	136	116	151
All	101	104	107	105	113	108	117	125	116	135
EU (15) <sup>3)</sup>	99	108	113	109	116	106	120	131	121	137

1) GP= General Practitioner.- 2) Severely hampered persons who have to cut down things they usually do due to chronic illness or disability (all health status together).- 3) Without Luxembourg and Sweden.  
Source: Projections by DIW.

The five-year higher life expectancy in the living-longer high scenario by 2050 leads to an increase in the population of 1 percentage point by 2050, but to a still higher rise in the utilisation of health care services (Table A40). The increase of hospital bed days is 18 percentage points higher and the increase of severely hampered persons is 22 percentage points higher by 2050, and the development of admissions and contacts with a general practitioner is around 12-13 percentage points higher (difference by constant health status).

Improvements in health lead to a contrary effect. Compared with the baseline scenario the baseline improving-health scenario leads to a 13 percentage point reduction in the increase in hospital bed days and to an 18 percentage point reduction in the increase in the number of severely hampered persons, but the number of contacts with a general practitioner is only 5 percentage points lower (EU) (see Table A41). Thus, improvements in health have a higher effect on hospital utilisation and the need for long-term care than on outpatient utilisation. This result could be attributed to behaviour

concerning a visit to a doctor: people in generally good health also visit a doctor for acute short-term health problems or for precautionary/prevention reasons.

Both effects together – longer life and improving health – taken with the underlying assumptions (a five-year higher life expectancy, a reduction of the proportion of people in bad health by 4 percentage points or nearly 30%) lead to only a marginal additional increase in utilisation compared with the baseline scenario in the EU and in some countries to a more or less decrease (Table A42). Since the scenarios of life expectancy in good health (LEGH) from WP1 were used to create the health scenarios, the expected higher growth rates of LEGH for France and Germany lead to a marked reduction in the number of hospital bed days and severely hampered persons in these countries. It may be that these growth rates are too optimistic, yet they show that improvements in health could have a compensating effect.



## Chapter 4. Informal Care-Giving

The European Community Household Panel (ECHP) provides information about utilisation of health care services as well as information about people who are looking after old and disabled persons and the characteristics of these people. The relevant question of the ECHP is: “Do your present daily activities include, without pay, looking after children or other persons who need special help because of old age, illness or disability?” (yes, looking after children/yes, looking after a person other than a child/yes, looking after a child and a person other than a child/not looking after any person). The categories of “yes, looking after a person other than a child” and “Yes, looking after a child and a person other than a child” were combined to derive the total number of people who are looking after old or disabled persons.

In the EU countries around 5.5% of people living in private households looked after old or disabled persons in 2001 (Table 4.1). But great differences exist among the participating countries in the share of people looking after old persons. The lowest share of care-givers is observed for Germany, 2%. The greatest share of care-givers at home can be observed in the UK, at around 16%. In the EU countries the proportion of persons who looked after old or disabled persons are greatest in the age groups 45-59 (9%) and 60-69 (8.6%). In Belgium, France, the Netherlands and the UK the share of care-givers is highest among persons aged 60-69, and in Denmark, Finland and Spain among people aged 45-59. An exception is Germany, where the share of care-giving persons increases sharply with age. In Germany 6.5% of persons aged 70-79 were care-givers as were around 16% of people aged 80+. But in the EU the proportion of care-givers among persons aged 70-79 (6.6%) and among those aged 80+ (5.1%) is also notable. Whereas middle-aged care-givers are mostly members of the family, in particular daughters and daughters-in-law, care-givers at older ages are mainly spouses or partners. Therefore, the care-giving potential in the oldest age group is also important for the provision of care at home.

*Table 4.1 Proportion of people looking after old persons by age group in participating countries and the EU\* (2001)*

Age-groups	Share of persons looking after old persons in %								
	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK	EU <sup>*)</sup>
15 - 29	(1,6)	(1,7)	(1,4)	(1,1)	(-)	(1,9)	1,1	6,5	1,7
30 - 44	4,2	3,3	3,5	2,4	0,8	4,2	4,1	11,8	4,1
45 - 59	9,6	7,2	11,0	4,2	1,7	9,6	10,3	24,9	9,0
60 - 69	13,2	(5,7)	10,3	8,1	3,2	10,6	8,6	27,3	8,6
70 - 79	(4,7)	(7,7)	(8,4)	4,9	6,5	8,9	6,7	20,6	6,6
80 +	(-)	(-)	(13,3)	(4,0)	15,8	(8,7)	(2,1)	12,2	5,1
Total	6,1	4,6	6,4	3,6	2,0	6,6	5,3	16,1	5,5

(-) = Number of observations under 30.- \*) EU (15) without Luxembourg and Sweden.  
Source: ECHP.

The analysis in WP2 shows that care-giving at home not only depends on age, but also on gender, health status, marital status, employment status and education. Regression analysis shows a highly significant influence of these factors on the possibility of becoming a care-giver at home. Table 4.2 shows the proportion of care-givers by gender, health status, marital status and employment status for the EU as an example. The share of care-givers among women in 2001 was twice as high (7.2%) as the share of care-givers among men (3.8%). The greatest proportion of care-givers can be observed among women aged 45-59, at around 12%. Health status is also relevant to the share of care-givers. People in fair health show the greatest proportion of care-givers, with the exception of the oldest age groups: those aged 70+ in good health have a higher possibility of being care-givers than those in fair or bad health.

*Table 4.2 Proportion of people looking after old persons by gender, health status, marital and employment status in the EU<sup>1)</sup> (%)*

Age-groups	Sex		Health status <sup>2)</sup>			Marital status					Employment status			Total
	Men	Women	1	2	3	Married	Sepa-rated	Di-vorced	Wi-dowed	Never married	Normally working	Unem-ployed	Inactive	
15 - 29	1,2	2,2	1,5	2,7	2,9	1,8	3,3	4,7	0,0	1,6	1,5	2,5	1,8	1,7
30 - 44	2,3	5,7	3,7	5,2	6,4	4,0	3,9	5,9	6,0	3,6	3,1	5,5	8,4	4,1
45 - 59	5,6	12,1	8,9	9,3	8,7	8,6	10,1	9,0	9,3	12,8	7,1	9,4	13,5	9,0
60 - 69	6,9	10,1	8,9	9,2	6,6	8,5	4,8	9,2	6,9	11,0	5,8	-	9,0	8,6
70 - 79	5,3	7,7	7,3	6,7	5,6	7,4	10,6	6,0	4,8	7,7	-	-	6,6	6,6
80 +	5,5	4,8	6,1	4,6	5,0	9,0	0,0	5,1	2,7	4,2	-	-	5,0	5,1
Total	3,8	7,2	4,8	7,0	6,4	6,5	6,3	7,6	5,1	3,1	-	-	-	5,5

1) EU (15) without Luxembourg and Sweden.- 2) Health status: 1 = good/very good health, 2 = fair health, 3 = bad/very bad health.  
Source: ECHP.

Marital status influences the possibility of being a care-giver in the various age groups in a different way. In the middle-aged group (45-59) the proportion of care-givers is highest among never-married women, around 17%, followed by never-married women aged 60-69 at around 15%; but in the oldest age group (80+) married persons show the highest proportion of care-givers. It can be assumed that daughters who were never married or are divorced tend to be care-givers to a greater extent than married daughters, whereas in the oldest age groups the possibility of receiving care at home is higher if a spouse can provide care.

The analyses made in WP2 also show that people who are normally working have a lower probability of becoming care-givers than people who are unemployed or inactive. The share of care-givers among normally working people at middle age (45-59 years old) amounts to 7.1%, among unemployed people it is 9.4% and among inactive people it is 13.5% (in EU countries in 2001). At all employment statuses women have a higher possibility of being care-givers than men and the greatest share of care-givers can be observed among inactive women aged 45-59 (14.6%). To summarise: care-givers at home are mostly women, who do not work.

Further developments in the number of care-givers are influenced by changes in age structure, health status at a given age, marital status or household composition and employment status, in particular changes in the labour force participation rates of women. With the data from the ECHP it is possible to show the effect of changes in the

age structure of the population and changes in the health status at a given age on the development of care-givers. As in the case of health care utilisation, the share of care-givers in a single age group and health status will be held constant and combined with the four demographic and health scenarios. These calculations are made for the EU as an example.

In 2001 around 17 million people reported that they looked after old or disabled persons (in the EU without Luxembourg or Sweden). Around 37% were aged 45-59 and around 16% were 70+. In the baseline scenario the number of care-givers is expected to increase up to 17.6 million by 2050 (Table 4.3). Owing to the ageing of the population, the age structure of care-givers will also change: the share of the oldest age groups (70-79 and 80+) together rises from 16% in 2001 to 26% in 2050. Improvements in health status do not lead to other notable developments, as the baseline improving-health scenario shows: the number of care-givers is only marginally higher and also the age structure is nearly the same as in the baseline scenario. A higher life expectancy leads to a higher number of care-givers, around 18.9 million, and to a higher proportion of the oldest care-givers. In 2050 around 30% of all care-givers will be aged 70+, thus the share of this age group will nearly double. Improvements in health in the living longer in better health scenario do not lead to other marked developments. This means that in the case of care-givers, the demographic development is the main influence and that changes in health status have only a little impact on the development of the total number of care-givers.

*Table 4.3 Development of care-givers using constant care-giving rates in the EU<sup>\*)</sup>*

Age-groups	2001		2050		
	Baseline scenario		Baseline improving health	Living-longer-high scenario	Living-longer better health
in 1000 persons					
15-29	1 203	954	932	954	933
30-44	3 500	2 501	2 453	2 510	2 462
45-59	6 311	5 854	5 858	5 924	5 928
60-69	3 274	3 761	3 828	3 897	3 966
70-79	1 902	2 702	2 734	2 967	3 002
80+	731	1 878	1 883	2 613	2 621
15+	16 920	17 649	17 688	18 865	18 912
Age-structure of care givers in the EU <sup>*)</sup> in %					
15-29	7,1	5,4	5,3	5,1	4,9
30-44	20,7	14,2	13,9	13,3	13,0
45-59	37,3	33,2	33,1	31,4	31,3
60-69	19,3	21,3	21,6	20,7	21,0
70-79	11,2	15,3	15,5	15,7	15,9
80+	4,3	10,6	10,6	13,9	13,9
15+	100,0	100,0	100,0	100,0	100,0
*) EU (15) without Luxembourg and Sweden. Source: Projections by DIW.					

The analyses in WP2 showed that around half of the care-givers provide care to persons in the same household and that the others provide care to persons who live elsewhere. In chapter 3 the number of severely hampered persons who have to cut down things they usually do due to illness or disability in private households was used as a soft proxy for people in need of care at home. With this variable it is possible to establish the relation of the number of hampered persons to care-givers. This is only a rough indicator to show the development of people in need of long-term care at home in relation to the development of informal care-givers and is not to be over-interpreted. It is only used to show the different development in the four scenarios and to get an idea of the increasing pressure on informal care-giving at home.

In 2001 the relative number of hampered persons to care-givers was at total 0.86 (which means there were 86 severely hampered persons per 100 care-givers on average in the EU). By 2050 this will increase up to 1.11 in the baseline scenario, to 0.94 in the baseline improving-health scenario, to 1.21 in the living-longer high scenario and to 1.04 in the living longer in better health scenario (Table 4.4). That means that a higher life expectancy leads to a higher relative number of hampered persons to care-givers, but that improvements in health can compensate for this effect: the relation between the two in the living longer in better health scenario is lower than in the baseline scenario in 2050.

*Table 4.4 Relation of hampered persons to care-givers in the EU<sup>\*)</sup>*

Age-groups	2001	2050			
	Baseline scenario	Baseline im-proving health	Living-longer-high scenario	Living-longer better health	
15-29	0,532	0,532	0,320	0,532	0,320
30-44	0,508	0,508	0,333	0,508	0,333
45-59	0,536	0,536	0,451	0,536	0,451
60-69	0,849	0,849	0,652	0,849	0,652
70-79	1,749	1,749	1,513	1,749	1,513
80+	3,599	3,599	3,341	3,599	3,341
15+	0,859	1,110	0,943	1,212	1,040

\*) EU (15) without Luxembourg and Sweden.  
Source: Projections by DIW.

In all four scenarios the pressure on care-giving at home will increase. These increases are not marginal. These relative numbers show the developments under the assumption of constant care-giving rates and a constant proportion of severely hampered persons per single age group and health status. Therefore, the relation in a single age group in 2001 is the same as in the baseline scenario, but the demographic change displaces the weight of the single age groups and thus the relation in total increases. If the aim is the relation in total in constant 2001 figures, then the relation in the single age groups

has to change, which implies that the care-giving rates have to rise, and as previously mentioned not by a marginal degree. The number of care-givers has to rise up to 22.8 million, which is 5.2 million more than calculated for the baseline scenario with constant care-giving rates.

Along with changes in age structure and health status, changes in marital status and in household composition have an important impact on the possibility of providing and receiving care at home. In the older population single households are common. Most of these households consist of widowed women. In WP2 changes in the family status of the population in the past were analysed. In all the participating countries, the share of single households in the younger ages (mostly below 45) has increased. If this trend continues, the potential for informal care-givers could decline. As mentioned before, in 2001 never-married women aged 45-69 had a higher possibility of being care-givers than married women, but this is not true for the younger ages. The increasing share of never-married persons in the younger ages can reduce the potential of care-givers. On the other hand, with respect to the increasing life expectancy for men and women, more people will be growing old together. In the past the proportion of married old men increased. The potential of care-givers within the oldest age groups could therefore rise.

Alders & Manting (2003) prepared internationally consistent household scenarios for all 15 EU countries. Based on information from the labour force statistics (LFS) of a single country, they analysed the past trends and created three household scenarios: an individualisation scenario that assumed that long-term trends of individualisation, emancipation and secularisation will lead to higher proportions of people living alone and fewer people living as a couple; a family scenario with an inverse trend; and a baseline scenario as an average of the two other trends. The latter was combined with the baseline scenario of the Eurostat population forecast and is therefore compatible with the analyses carried out in this report.

In the EU member states, 14 million men and 11.5 million women aged 65-79, and 2.4 million men and 1.3 million women aged 80+ lived with a partner in 1995 (Table 4.5). In their baseline scenario the authors expected a high increase in the number of elderly persons living with a partner. The number of men aged 65-79 (women) living with a partner will increase up to 21.3 (19.6) million in 2025 and the number of 80+ aged men living with a partner will increase up to 4.5 (3.4) million. In these age groups, the share of women living with a partner will increase, while for men a little decrease is expected.

With respect to these results it can be expected that the care-giving potential of women aged 65+ for a partner in need for long-term care will increase, but otherwise the care-giving potential of men aged 65+ for a partner in need of long-term care will decline. The share of men aged 80+ living alone will increase from 29% up to 33% in 2025. Thus, for this group of oldest men the pressure for professional care-giving could increase if the need for long-term care appears.

Table 4.5 EU population by gender, age group and household composition

Age-groups	1995			Baseline scenario 2025			1995			Baseline scenario 2025		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	In million people						Household structure in %					
Living alone												
0 - 19	0,2	0,2	0,4	0,2	0,4	0,6	0,4	0,5	0,5	0,5	1,1	0,8
20 - 64	12,6	10,7	23,3	18,5	15,0	33,5	11,3	9,6	10,4	16,4	13,7	15,0
65 - 79	2,5	9,3	11,8	5,2	10,1	15,3	14,1	38,6	28,2	18,5	31,0	25,2
80 +	1,2	5,3	6,5	2,6	7,5	10,1	28,6	60,2	50,0	32,5	58,6	48,6
Total	16,5	25,5	42,0	26,5	33,0	59,5	9,2	13,6	11,5	14,1	17,1	15,6
Living with a partner												
0 - 19	0,1	0,3	0,4	0,2	0,5	0,7	0,2	0,7	0,5	0,5	1,3	0,9
20 - 64	73,2	76,6	149,8	74,8	77,0	151,8	65,4	68,7	67,0	66,3	70,1	68,2
65 - 79	14,0	11,5	25,5	21,3	19,6	40,9	79,1	47,7	61,0	75,8	60,1	67,4
80 +	2,4	1,3	3,7	4,5	3,4	7,9	57,1	14,8	28,5	56,3	26,6	38,0
Total	89,7	89,7	179,4	100,8	100,5	201,3	50,1	47,9	49,0	53,4	52,1	52,8
Living at parental home												
0 - 19	43,7	41,3	85,0	38,2	36,0	74,2	96,9	96,3	96,6	96,5	95,2	95,9
20 - 64	20,1	13,3	33,4	14,1	8,6	22,7	17,9	11,9	14,9	12,5	7,8	10,2
65 - 79	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
80 +	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Total	63,8	54,6	118,4	52,3	44,6	96,9	35,6	29,2	32,3	27,7	23,1	25,4
Other household composition												
0 - 19	1,1	1,1	2,2	1,0	0,9	1,9	2,4	2,6	2,5	2,5	2,4	2,5
20 - 64	6,1	10,9	17,0	5,5	9,2	14,7	5,4	9,8	7,6	4,9	8,4	6,6
65 - 79	1,2	3,3	4,5	1,6	2,9	4,5	6,8	13,7	10,8	5,7	8,9	7,4
80 +	0,6	2,2	2,8	0,9	1,9	2,8	14,3	25,0	21,5	11,3	14,8	13,5
Total	9,0	17,5	26,5	9,0	14,9	23,9	5,0	9,3	7,2	4,8	7,7	6,3
Total												
0 - 19	45,1	42,9	88,0	39,6	37,8	77,4	100	100	100	100	100	100
20 - 64	112,0	111,5	223,5	112,9	109,8	222,7	100	100	100	100	100	100
65 - 79	17,7	24,1	41,8	28,1	32,6	60,7	100	100	100	100	100	100
80 +	4,2	8,8	13,0	8,0	12,8	20,8	100	100	100	100	100	100
Total	179,0	187,3	366,3	188,6	193,0	381,6	100	100	100	100	100	100

Sources: Alders/Manting (2003); projections by DIW.

Alongside informal care-giving by partners, care-giving by daughters and daughters-in-law plays an important role, as previously mentioned. Around 58% of informal care-givers were aged 45-69 in 2001 and around 70% of these care-givers were female. To get an idea about the development of this potential care-giver group, the relation of people aged 70+ to women aged 45-69 was calculated for the baseline scenario as an example. Table 4.6 shows the results. In all participating countries a high increase in the relation is expected. In Spain, for example, there were 80 people aged 70+ per 100 women aged 45-69 in 1999. By 2050 this proportion will increase up to 171. This development can also be an indicator of the increasing pressure for potential informal care-givers – as the case of the changing relation of hampered persons to care-givers has shown.

*Table 4.6 People aged 70+ per 100 women aged 45-69*

Countries	1999	2001	2010	2020	2030	2040	2050
	Baseline scenario						
Belgium	79,4	81,1	79,9	87,3	113,8	137,5	137,0
Denmark	71,9	69,9	66,7	86,7	104,3	121,6	121,1
Finland	66,4	67,1	68,1	97,2	123,2	129,6	124,9
France	79,5	80,8	79,3	89,7	114,4	135,1	138,7
Germany	72,9	73,6	86,1	88,5	109,1	149,0	141,5
Netherlands	66,8	66,3	63,6	80,3	102,6	121,7	110,3
Spain	81,5	84,9	83,7	80,6	92,1	129,1	170,7
United Kingdom	79,9	79,0	71,5	83,4	101,2	128,9	126,6
All	76,6	77,4	78,9	86,1	105,9	135,7	138,4
EU (15) *)	76,9	78,1	80,7	86,8	105,2	136,7	143,9

\*) Without Luxembourg and Sweden.  
Sources: EU-EPC 2000 (Baseline scenario); projections by DIW.

As shown in WP2, family-oriented women are more often care-givers than career-oriented women. But in the past the share of family-oriented women decreased in all EU countries and it can be assumed that this trend will continue in the future. One indicator of changing behaviour is the employment rate of women. In the middle-aged group in particular employment has increased in the past. It can be expected that this trend will continue. Therefore, the potential supply of informal care-givers could decrease.

## Chapter 5. Concluding Remarks

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In this report, developments in health care and long-term care services utilisation up to 2050 have been projected on two levels: in chapter 2 utilisation data from national sources provided by the participants of the AGIR project about hospital admissions, length of hospital stay, contacts with a doctor, long-term care-giving in institutions and long-term care-giving at home by professional care-givers were used and combined with two demographic scenarios. The data from national sources have two advantages: 1) they cover the whole population and therefore forecasts of health care utilisation can be made for the total population; 2) they include information about long-term care-giving in institutions (for six participating countries) and information about long-term care-giving at home (for four participating countries). But they have the disadvantage of not differentiating between the health statuses of the population. Therefore, in this chapter only the impact of demographic change and increasing life expectancy on the utilisation of health care services can be assessed.

In chapter 3 data from the European Community Household Panel (ECHP) were used, which includes only persons in private households aged 16+, but allows differentiation of the health care utilisation data not only by age groups but also by health status in a single age group. Information is available about hospital admissions, hospital days and contacts with a general practitioner. Thus, the main fields of acute health care are also covered by the ECHP. No information exists about people receiving long-term care, but the number of severely hampered persons who have to cut down things they usually do owing to disability or longstanding illness are used as a soft proxy for the need for long-term care at home. These care utilisation data were combined with four demographic and health scenarios: the baseline scenario, the baseline improving-health scenario, the living-longer high scenario and the living longer in better health scenario. The baseline scenario stems from Eurostat and includes increases in life expectancy, but in the living-longer high scenario, which was created from the AGIR partner CPB (Pellikaan & Westerhout, 2004), a five-year higher life expectancy was assumed. In the health scenarios that have been created in this report it has been assumed that the share of people in bad health decreases by 30% on average in the EU by 2050. This assumption was derived from the estimation of life expectancy in good health carried out in AGIR WP1 (Ahn et al., 2003).

The results of the forecasts in chapters 2 and 3 are not fully comparable, because they use different sources and different definitions of the variables, but in general they show similar developments:

- developments in the number of hospital days and the need for long-term care-giving for severely hampered persons show greater changes than the developments in hospital admissions and contacts with a doctor/general practitioner;
- the living-longer high scenario leads to an increased population by 2050, but developments in the utilisation of health care services are even greater; and
- countries with a decreasing population until 2050 do not generally show lower increases in health care utilisation than countries with an increasing population.



Notable distinctions are the expected increase of long-term care recipients from national sources and the increase of severely hampered persons from the ECHP. The development of long-term care recipients at home shows a much more significant increase than the development of hampered persons. It can be assumed that the soft proxy of ‘severely hampered persons who have to cut down things they usually do due to longstanding illness or disability’ underestimates the development of the need for long-term care at home. This could be linked back to the fact that the oldest old, especially persons with a longstanding illness or disability, are generally under-represented in private household surveys such as the ECHP.

The estimations in chapter 3 show that improvements in health status lead to a more moderate increase in health care utilisation compared with the scenarios without improvements in health. But in general, given the underlying assumptions the improvements in health cannot completely compensate for the effect of increasing life expectancy. In the EU the health care utilisation figures are a little bit higher in the living longer in better health scenario than in the baseline scenario in 2050.

In chapter 4 the development of the number of care-givers at home is calculated using constant care-giving rates in a single age group and health status. In contrast to the estimations of health care utilisation, a better health status does not lead to a markedly higher number of care-givers. The main effect is the demographic development and the additional increase in life expectancy in the living-longer scenario. The number of care-givers increases until 2050, especially in the living-longer scenario, and the share of care-givers aged 70+ rises sharply. The development of the relation of severely hampered persons to the number of care-givers shows that the pressure on informal care-giving will also increase. If the higher rises in the number of long-term care recipients at home as estimated by national sources are taken into account, this relative number may have a much higher potential. The expected changes in household composition and increases in the labour force participation rates of women will also strengthen this development.

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## Appendix

*Table A.1 Population development (1990 = 100)*

Countries	2010	2020	2030	2040	2050
Baseline scenario					
Belgium	101	103	103	101	99
Denmark	103	104	106	105	104
Finland	102	103	102	99	95
France	104	106	108	107	105
Germany	102	101	100	97	92
Netherlands	105	108	110	111	110
Spain	101	100	98	94	88
United Kingdom	103	105	106	106	104
Total	102	103	103	102	98
EU (15)	102	103	102	100	96
Living-longer-low scenario					
Belgium	102	103	104	103	100
Denmark	103	105	107	107	106
Finland	102	103	103	100	97
France	104	107	108	108	106
Germany	102	102	100	98	94
Netherlands	105	109	111	112	112
Spain	101	100	98	95	90
United Kingdom	103	105	107	107	105
Total	103	104	104	103	100
EU (15)	102	103	103	101	98
Living-longer-middle scenario					
Belgium	102	104	105	104	102
Denmark	103	105	108	108	108
Finland	102	104	104	102	99
France	104	107	109	110	108
Germany	102	102	101	99	96
Netherlands	105	109	112	114	114
Spain	101	101	99	97	92
United Kingdom	103	106	108	108	108
Total	103	104	105	104	102
EU (15)	102	104	104	103	100
Living-longer-high scenario					
Belgium	102	104	105	105	104
Denmark	103	106	109	110	110
Finland	102	104	105	103	101
France	104	108	110	111	110
Germany	102	103	102	101	98
Netherlands	105	110	113	115	116
Spain	102	101	100	98	94
United Kingdom	103	106	109	110	109
Total	103	105	106	106	104
EU (15)	102	104	105	104	102

Sources: EU-EPC 2000 (Baseline scenario); Pellikaan/Westerhout 2004 (Living-longer-high scenario); calculations by DIW.



Table A.2 Age structure of the population (%)

Countries	Baseline scenario					Living-longer-high scenario				
	Age-groups									
	0 - 14	15 - 59	60 - 74	75 - 89	90+	0 - 14	15 - 59	60 - 74	75 - 89	90+
	2020/1999									
Belgium	-2,1	-4,2	4,0	1,9	0,4	-2,3	-4,8	4,1	2,5	0,5
Denmark	-2,6	-3,8	4,7	1,7	0,1	-2,8	-4,4	4,8	2,3	0,2
Finland	-2,6	-6,7	6,5	2,5	0,4	-2,8	-7,4	6,6	3,1	0,5
France	-2,2	-4,4	4,5	1,7	0,4	-2,4	-4,9	4,6	2,1	0,6
Germany	-2,2	-4,0	2,3	3,6	0,3	-2,4	-4,7	2,3	4,3	0,5
Netherlands	-2,2	-5,2	5,5	1,8	0,2	-2,5	-5,9	5,6	2,4	0,3
Spain	-1,7	-3,9	2,8	2,2	0,5	-1,9	-4,6	2,9	2,8	0,7
United Kingdom	-2,9	-2,2	3,9	1,0	0,2	-3,1	-2,8	4,0	1,6	0,3
Total	-2,3	-3,8	3,6	2,2	0,3	-2,5	-4,5	3,6	2,8	0,5
EU (15)	-2,2	-3,9	3,4	2,3	0,4	-2,4	-4,5	3,4	2,9	0,5
	2050/2020									
Belgium	-0,1	-4,2	-1,1	4,6	0,8	-0,7	-6,1	-1,4	6,4	1,8
Denmark	0,0	-2,6	-1,6	3,6	0,6	-0,7	-4,6	-1,7	5,6	1,4
Finland	-0,9	-2,3	-1,4	3,7	1,0	-1,4	-4,2	-1,7	5,3	1,9
France	-1,2	-4,4	-0,6	5,2	1,0	-1,7	-6,0	-0,7	6,6	1,8
Germany	-0,6	-5,7	0,7	4,5	1,1	-1,2	-7,9	0,3	6,6	2,2
Netherlands	0,1	-2,1	-1,9	3,3	0,6	-0,6	-4,1	-2,0	5,3	1,4
Spain	-1,1	-10,6	3,0	7,8	0,8	-1,7	-12,7	2,7	9,8	1,8
United Kingdom	-0,8	-5,1	0,3	4,7	0,8	-1,4	-7,1	0,0	6,7	1,8
Total	-0,7	-5,5	0,3	5,0	0,9	-1,3	-7,5	0,0	6,9	1,9
EU (15)	-0,6	-6,0	0,4	5,3	0,9	-1,2	-7,9	0,1	7,2	1,9
	2050/1999									
Belgium	-2,2	-8,4	2,9	6,5	1,2	-3,0	-10,9	2,7	8,9	2,3
Denmark	-2,7	-6,4	3,1	5,3	0,7	-3,5	-9,1	3,1	7,9	1,6
Finland	-3,5	-9,1	5,0	6,2	1,3	-4,3	-11,6	4,9	8,4	2,5
France	-3,4	-8,8	4,0	6,8	1,4	-4,1	-11,0	3,9	8,7	2,4
Germany	-2,8	-9,7	3,0	8,2	1,4	-3,6	-12,6	2,7	10,9	2,6
Netherlands	-2,1	-7,3	3,6	5,1	0,8	-3,0	-10,0	3,6	7,6	1,8
Spain	-2,8	-14,5	5,9	10,0	1,4	-3,5	-17,2	5,6	12,6	2,6
United Kingdom	-3,6	-7,3	4,2	5,8	1,0	-4,5	-9,9	4,0	8,3	2,1
Total	-2,9	-9,3	3,9	7,2	1,2	-3,8	-11,9	3,7	9,6	2,4
EU (15)	-2,8	-9,9	3,8	7,6	1,3	-3,6	-12,5	3,6	10,1	2,4

Sources: EU-EPC 2000 (Baseline scenario); Pellikaan/Westerhout 2004 (Living-longer-high scenario); calculations by DIW.

Table A.3 Changes in the age structure of the population (percentage points)

Countries	Baseline scenario					Living-longer-high scenario				
	Age-groups									
	0 - 14	15 - 59	60 - 74	75 - 89	90+	0 - 14	15 - 59	60 - 74	75 - 89	90+
	2020/1999									
Belgium	-2,1	-4,2	4,0	1,9	0,4	-2,3	-4,8	4,1	2,5	0,5
Denmark	-2,6	-3,8	4,7	1,7	0,1	-2,8	-4,4	4,8	2,3	0,2
Finland	-2,6	-6,7	6,5	2,5	0,4	-2,8	-7,4	6,6	3,1	0,5
France	-2,2	-4,4	4,5	1,7	0,4	-2,4	-4,9	4,6	2,1	0,6
Germany	-2,2	-4,0	2,3	3,6	0,3	-2,4	-4,7	2,3	4,3	0,5
Netherlands	-2,2	-5,2	5,5	1,8	0,2	-2,5	-5,9	5,6	2,4	0,3
Spain	-1,7	-3,9	2,8	2,2	0,5	-1,9	-4,6	2,9	2,8	0,7
United Kingdom	-2,9	-2,2	3,9	1,0	0,2	-3,1	-2,8	4,0	1,6	0,3
Total	-2,3	-3,8	3,6	2,2	0,3	-2,5	-4,5	3,6	2,8	0,5
EU (15)	-2,2	-3,9	3,4	2,3	0,4	-2,4	-4,5	3,4	2,9	0,5
	2050/2020									
Belgium	-0,1	-4,2	-1,1	4,6	0,8	-0,7	-6,1	-1,4	6,4	1,8
Denmark	0,0	-2,6	-1,6	3,6	0,6	-0,7	-4,6	-1,7	5,6	1,4
Finland	-0,9	-2,3	-1,4	3,7	1,0	-1,4	-4,2	-1,7	5,3	1,9
France	-1,2	-4,4	-0,6	5,2	1,0	-1,7	-6,0	-0,7	6,6	1,8
Germany	-0,6	-5,7	0,7	4,5	1,1	-1,2	-7,9	0,3	6,6	2,2
Netherlands	0,1	-2,1	-1,9	3,3	0,6	-0,6	-4,1	-2,0	5,3	1,4
Spain	-1,1	-10,6	3,0	7,8	0,8	-1,7	-12,7	2,7	9,8	1,8
United Kingdom	-0,8	-5,1	0,3	4,7	0,8	-1,4	-7,1	0,0	6,7	1,8
Total	-0,7	-5,5	0,3	5,0	0,9	-1,3	-7,5	0,0	6,9	1,9
EU (15)	-0,6	-6,0	0,4	5,3	0,9	-1,2	-7,9	0,1	7,2	1,9
	2050/1999									
Belgium	-2,2	-8,4	2,9	6,5	1,2	-3,0	-10,9	2,7	8,9	2,3
Denmark	-2,7	-6,4	3,1	5,3	0,7	-3,5	-9,1	3,1	7,9	1,6
Finland	-3,5	-9,1	5,0	6,2	1,3	-4,3	-11,6	4,9	8,4	2,5
France	-3,4	-8,8	4,0	6,8	1,4	-4,1	-11,0	3,9	8,7	2,4
Germany	-2,8	-9,7	3,0	8,2	1,4	-3,6	-12,6	2,7	10,9	2,6
Netherlands	-2,1	-7,3	3,6	5,1	0,8	-3,0	-10,0	3,6	7,6	1,8
Spain	-2,8	-14,5	5,9	10,0	1,4	-3,5	-17,2	5,6	12,6	2,6
United Kingdom	-3,6	-7,3	4,2	5,8	1,0	-4,5	-9,9	4,0	8,3	2,1
Total	-2,9	-9,3	3,9	7,2	1,2	-3,8	-11,9	3,7	9,6	2,4
EU (15)	-2,8	-9,9	3,8	7,6	1,3	-3,6	-12,5	3,6	10,1	2,4

Sources: EU-EPC 2000 (Baseline scenario); Pellikaan/Westerhout 2004 (Living-longer-high scenario); calculations by DIW.

Table A.4 Changes in the population aged 15+ by health status between 2001 and 2050 (%)

Age-groups	Baseline scenario				Baseline improving health scenario				Living-longer scenario				Living-longer better health scenario			
	People in ... health															
	good	fair	bad	total	good	fair	bad	total	good	fair	bad	total	good	fair	bad	total
Belgium																
15-29	-12.3	-12.3	-12.3	-12.3	-9.5	-35.4	-76.9	-12.3	-12.3	-12.3	-12.3	-9.5	-35.3	-76.9	-12.3	
30-44	-24.4	-24.4	-24.4	-24.4	-22.0	-23.1	-96.2	-24.4	-24.1	-24.1	-24.1	-21.7	-22.9	-96.2	-24.1	
45-59	-8.7	-8.7	-8.7	-8.7	-5.8	-7.2	-56.9	-8.7	-7.7	-7.7	-7.7	-4.7	-6.2	-56.4	-7.7	
60-69	21.0	21.0	21.0	21.0	24.7	26.8	-89.6	21.0	25.0	25.0	25.0	28.8	30.9	-89.3	25.0	
70-79	28.1	28.1	28.1	28.1	40.3	34.2	-35.8	28.1	40.1	40.1	40.1	53.4	46.8	-29.8	40.1	
80+	152.6	152.6	152.6	152.6	176.5	164.5	63.4	152.6	254.2	254.2	254.2	287.7	270.9	129.1	254.2	
15+	-5.5	17.3	26.3	0.7	-1.7	19.4	-43.4	0.7	-1.6	30.9	46.2	7.3	2.6	33.6	-31.3	7.3
Denmark																
15-29	2.6	2.6	2.6	2.6	4.8	-4.0	-95.1	2.6	2.7	2.7	2.7	4.8	-3.9	-95.1	2.7	
30-44	-18.2	-18.2	-18.2	-18.2	-16.5	-17.3	-68.6	-18.2	-17.9	-17.9	-17.9	-16.2	-17.0	-68.5	-17.9	
45-59	-2.3	-2.3	-2.3	-2.3	-0.2	-1.2	-35.3	-2.3	-0.9	-0.9	-0.9	1.2	0.2	-34.4	-0.9	
60-69	18.7	18.7	18.7	18.7	25.9	22.3	-35.9	18.7	24.0	24.0	24.0	31.6	27.8	-33.0	24.0	
70-79	57.8	57.8	57.8	57.8	67.4	62.7	16.1	57.8	77.8	77.8	77.8	88.7	83.3	30.8	77.8	
80+	107.7	107.7	107.7	107.7	140.3	94.5	79.5	107.7	202.5	202.5	202.5	250.0	183.2	161.4	202.5	
15+	2.1	19.1	33.1	7.1	5.7	18.8	-10.7	7.1	6.5	33.5	56.7	14.4	10.5	32.7	8.7	14.4
Finland																
15-29	-16.9	-16.9	-16.9	-16.9	-14.3	-37.3	-46.1	-16.9	-16.8	-16.8	-16.8	-14.3	-37.3	-46.0	-16.8	
30-44	-19.8	-19.8	-19.8	-19.8	-17.3	-27.8	-83.3	-19.8	-19.5	-19.5	-19.5	-17.0	-27.5	-83.2	-19.5	
45-59	-19.2	-19.2	-19.2	-19.2	-16.7	-17.9	-51.8	-19.2	-18.1	-18.1	-18.1	-15.6	-16.8	-51.2	-18.1	
60-69	25.4	25.4	25.4	25.4	37.0	31.2	-56.9	25.4	30.0	30.0	30.0	42.0	36.0	-55.4	30.0	
70-79	38.0	38.0	38.0	38.0	50.7	44.4	-10.2	38.0	51.2	51.2	51.2	65.3	58.3	-1.6	51.2	
80+	147.6	147.6	147.6	147.6	170.6	159.1	120.0	147.6	249.2	249.2	249.2	281.6	265.4	210.3	249.2	
15+	-11.9	12.4	41.8	-1.5	-8.2	13.4	-3.8	-1.5	-9.8	23.6	70.6	5.0	-5.9	25.2	20.5	5.0
France																
15-29	-13.9	-13.9	-13.9	-13.9	-9.4	-25.8	-80.0	-13.9	-13.8	-13.8	-13.8	-9.3	-25.7	-79.9	-13.8	
30-44	-16.3	-16.3	-16.3	-16.3	-11.8	-14.6	-101.8	-16.3	-15.9	-15.9	-15.9	-11.4	-14.2	-101.8	-15.9	
45-59	-4.4	-4.4	-4.4	-4.4	0.7	-1.7	-52.1	-4.4	-3.1	-3.1	-3.1	2.1	-0.4	-51.4	-3.1	
60-69	40.5	40.5	40.5	40.5	63.0	51.6	-72.1	40.5	45.4	45.4	45.4	68.8	57.0	-71.1	45.4	
70-79	44.6	44.6	44.6	44.6	67.8	56.1	-23.1	44.6	56.7	56.7	56.7	81.9	69.2	-16.6	56.7	
80+	163.7	163.7	163.7	163.7	206.1	184.7	63.7	163.7	250.4	250.4	250.4	306.6	278.3	117.5	250.4	
15+	-2.8	19.9	35.0	7.7	4.7	24.5	-42.7	7.7	0.1	30.3	50.7	14.1	7.9	35.7	-33.7	14.1
Germany																
15-29	-18.3	-18.3	-18.3	-18.3	-11.7	-20.7	-98.0	-18.3	-18.3	-18.3	-18.3	-11.6	-20.7	-98.0	-18.3	
30-44	-34.6	-34.6	-34.6	-34.6	-29.3	-31.9	-78.5	-34.6	-34.4	-34.4	-34.4	-29.1	-31.6	-78.4	-34.4	
45-59	-8.8	-8.8	-8.8	-8.8	-1.4	-5.0	-28.8	-8.8	-7.7	-7.7	-7.7	-0.2	-3.8	-27.9	-7.7	
60-69	-2.1	-2.1	-2.1	-2.1	22.0	9.7	-43.9	-2.1	1.4	1.4	1.4	26.4	13.6	-41.9	1.4	
70-79	29.1	29.1	29.1	29.1	61.0	44.8	-6.9	29.1	42.1	42.1	42.1	77.1	59.2	2.4	42.1	
80+	172.5	172.5	172.5	172.5	239.8	205.5	132.4	172.5	283.6	283.6	283.6	378.4	330.0	227.2	283.6	
15+	-18.2	-0.4	17.3	-5.6	-9.2	7.1	-20.2	-5.6	-16.2	8.2	34.4	1.4	-6.7	16.7	-6.1	1.4
Netherlands																
15-29	8.0	8.0	8.0	8.0	10.8	-1.1	-82.5	8.0	8.1	8.1	8.1	10.9	-1.0	-82.4	8.1	
30-44	-15.8	-15.8	-15.8	-15.8	-13.6	-14.6	-86.2	-15.8	-15.5	-15.5	-15.5	-13.3	-14.4	-86.1	-15.5	
45-59	0.0	0.0	0.0	0.0	2.6	1.4	-39.4	0.0	1.4	1.4	1.4	4.0	2.8	-38.6	1.4	
60-69	36.4	36.4	36.4	36.4	46.9	41.7	-74.6	36.4	42.1	42.1	42.1	53.0	47.6	-73.6	42.1	
70-79	54.7	54.7	54.7	54.7	66.6	60.7	-26.0	54.4	73.6	73.6	73.6	86.9	80.3	-16.9	73.3	
80+	145.7	145.7	145.7	145.7	164.6	155.2	40.8	145.7	264.8	264.8	264.8	292.8	278.9	109.0	264.8	
15+	5.8	26.5	28.1	11.4	9.8	28.9	-46.7	11.3	10.1	42.5	44.9	18.8	14.4	45.4	-37.8	18.8
Spain																
15-29	-43.7	-43.7	-43.7	-43.7	-41.9	-58.1	-83.1	-43.7	-43.6	-43.6	-43.6	-41.9	-58.0	-83.1	-43.6	
30-44	-36.9	-36.9	-36.9	-36.9	-34.9	-35.9	-88.5	-36.9	-36.6	-36.6	-36.6	-34.6	-35.6	-88.5	-36.6	
45-59	-11.3	-11.3	-11.3	-11.3	-8.6	-9.9	-35.9	-11.3	-10.1	-10.1	-10.1	-7.3	-8.6	-35.0	-10.1	
60-69	15.3	15.3	15.3	15.3	30.0	22.6	-27.8	15.3	19.7	19.7	19.7	35.0	27.3	-25.0	19.7	
70-79	61.2	61.2	61.2	61.2	81.7	71.4	23.3	61.2	77.0	77.0	77.0	99.6	88.2	35.4	77.0	
80+	152.3	152.3	152.3	152.3	184.4	168.2	111.2	152.3	250.2	250.2	250.2	294.8	272.3	193.1	250.2	
15+	-23.2	15.1	37.4	-9.2	-19.0	19.3	-1.2	-9.2	-20.3	28.2	58.9	-2.2	-15.7	33.2	16.3	-2.2
UK																
15-29	-6.8	-6.8	-6.8	-6.8	-3.4	-5.0	-64.9	-6.8	-6.8	-6.8	-6.8	-3.3	-5.0	-64.9	-6.8	
30-44	-21.7	-21.7	-21.7	-21.7	-18.8	-20.2	-52.8	-21.7	-21.5	-21.5	-21.5	-18.6	-20.0	-52.7	-21.5	
45-59	1.5	1.5	1.5	1.5	5.2	3.5	-28.8	1.5	2.5	2.5	2.5	6.3	4.5	-28.1	2.5	
60-69	37.5	37.5	37.5	37.5	52.5	45.0	-65.0	37.5	42.3	42.3	42.3	57.8	50.1	-63.8	42.3	
70-79	44.2	44.2	44.2	44.2	60.0	52.1	-30.8	44.2	59.8	59.8	59.8	77.2	68.5	-23.4	59.8	
80+	132.4	132.4	132.4	132.4	157.8	145.1	47.0	132.4	230.4	230.4	230.4	266.4	248.4	109.0	230.4	
15+	3.5	14.6	19.5	7.4	9.6	18.8	-36.3	7.4	8.9	25.0	33.0	14.5	15.5	29.7	-28.4	14.5
All																
15-29	-17.4	-14.8	-15.2	-16.9	-13.4	-20.7	-83.4	-16.9	-17.4	-14.8	-15.1	-16.9	-13.3	-20.7	-83.4	-16.9
30-44	-26.3	-26.7	-28.0	-26.5	-22.7	-24.8	-76.1	-26.5	-26.0	-26.5	-27.8	-26.2	-24.4	-24.6	-76.0	-26.2
45-59	-4.9	-6.3	-6.4	-5.5	-0.5	-3.6	-33.8	-5.5	-3.7	-5.1	-5.3	4.3	0.7	-2.4	-33.0	-4.3
60-69	24.8	17.4	12.2	19.5	41.9	27.3	-48.6	19.5	29.3	21.7	16.3	23.8	47.1	31.9	-46.7	23.8
70-79	44.5	41.7	40.4	42.3	64.2	53.2	-8.0	42.3	59.1	55.6	54.2	56.4	80.8	68.2	1.0	56.4
80+	146.3	156.5	159.9	154.9	179.8	176.8	102.5	154.9	245.5	256.1	262.8	255.4	292.2	284.2	183.1	255.4
15+	-7.9	11.0	23.6	0.9	-1.5	16.3	-24.5	0.9	-4.4	21.5	40.7	7.8	2.4	27.6	-11.8	7.8
EU 15 (without Lux, Swe)																
15-29	-20.7	-20.7	-20.7	-20.7	-20.0	-15.2	-79.3	-20.7	-20.7	-20.7	-20.7	-19.9	-15.1	-79.3	-20.7	
30-44	-28.5	-28.5	-28.5	-28.5	-26.6	-27.4	-69.7	-28.5	-28.3	-28.3	-28.3	-26.3	-27.1	-69.6	-28.3	
45-59	-7.2	-7.2	-7.2	-7.2	-4.0	-5.6	-33.5	-7.2	-6.1	-6.1	-6.1	-2.9	-4.4	-32.7	-6.1	
60-69	14.9	14.9	14.9	14.9	26.8	20.8	-27.8	14.9	19.0	19.0	19.0	31.3	25.1	-25.3	19.0	
70-79	42.0	42.0	42.0	42.0	56.7	49.4	11.9	42.0	55.8	55.8	55.8	72.0	63.9	22.8	55.8	
80+	157.1	157.1	157.1	157.1	183.7	170.4	122.2	157.1	256.8	256.8	256.8	293.7	275.3	208.4	256.8	
15+	-11.4	11.4	30.8	-1.3	-7.9	16.4	-2.9	-1.3	-8.4	22.3	50.7	5.5	-4.5	28.0	14.3	5.5

Sources: EU-EPC 2000 (Baseline scenario); Pellikaan/Westerhout 2004 (Living-longer-high scenario); calculations by DIW.

*Table A.5 Development of hospital admissions/discharges (1999 = 100)*

Countries	2010	2020	2030	2040	2050
Baseline scenario					
Belgium	106	112	117	119	116
Denmark	104	112	120	120	120
Finland	108	119	129	128	123
France	106	112	118	120	117
Germany	108	113	116	118	113
Netherlands	112	123	132	134	131
Spain	106	109	114	117	113
United Kingdom	103	111	117	120	119
Total	106	112	117	119	116
Living-longer-high scenario					
Belgium	107	115	123	128	129
Denmark	105	115	127	132	136
Finland	110	123	138	142	140
France	107	114	122	127	127
Germany	109	117	123	128	127
Netherlands	113	127	139	146	148
Spain	107	112	119	127	129
United Kingdom	104	114	122	129	134
Total	107	115	123	129	130
*) For France and United Kingdom: 2000 = 100.					
Source: Calculations by DIW.					

*Table A.6 Hospital cases by age group – Changes within the age groups (per 1000 persons)*

Countries	Baseline scenario					Living-longer-high scenario				
	Age-groups									
	0 - 14	15 - 64	65 - 74	75+	Total	0 - 14	15 - 64	65 - 74	75+	Total
	2020/1999 <sup>*)</sup>									
Belgium	- 9	27	73	112	203	- 9	31	80	151	253
Denmark	- 18	12	73	63	129	- 18	14	80	92	168
Finland	- 14	- 34	141	170	262	- 14	- 32	150	217	320
France	- 68	196	519	462	1 109	- 68	217	554	610	1 312
Germany	- 163	- 35	623	1 749	2 173	- 163	2	696	2 194	2 730
Netherlands	- 6	79	149	130	352	- 6	83	159	169	405
Spain	- 61	31	79	356	405	- 61	41	97	472	549
United Kingdom	- 129	358	540	432	1 201	- 129	379	593	692	1 535
Total	- 469	634	2 197	3 473	5 835	- 469	736	2 408	4 598	7 273
	2050/2020									
Belgium	- 12	- 113	- 24	217	67	- 12	- 109	- 13	374	239
Denmark	- 3	- 30	- 23	145	89	- 3	- 26	- 14	273	230
Finland	- 13	- 75	- 56	195	52	- 13	- 72	- 46	369	239
France	- 101	- 499	- 72	1 169	498	- 101	- 468	- 15	1 780	1 196
Germany	- 166	- 1 704	- 27	1 767	- 130	- 166	- 1 664	95	3 417	1 681
Netherlands	3	- 40	- 34	196	126	3	- 34	- 18	375	325
Spain	- 66	- 673	167	771	199	- 66	- 662	212	1 254	738
United Kingdom	- 106	- 571	18	1 649	991	- 106	- 544	96	2 851	2 297
Total	- 463	- 3 704	- 52	6 110	1 891	- 463	- 3 579	295	10 693	6 946
	2050/1999 <sup>*)</sup>									
Belgium	- 21	- 86	49	328	270	- 21	- 78	67	525	492
Denmark	- 22	- 18	50	208	218	- 22	- 12	65	366	398
Finland	- 27	- 108	85	365	315	- 27	- 103	103	586	559
France	- 169	- 303	447	1 631	1 607	- 169	- 252	538	2 391	2 508
Germany	- 329	- 1 740	596	3 516	2 043	- 329	- 1 662	791	5 611	4 411
Netherlands	- 3	39	115	327	477	- 3	49	141	544	730
Spain	- 127	- 642	247	1 127	605	- 127	- 620	309	1 726	1 288
United Kingdom	- 235	- 213	558	2 081	2 192	- 235	- 165	689	3 542	3 832
Total	- 932	- 3 070	2 145	9 583	7 727	- 932	- 2 843	2 703	15 290	14 218

\*) France and United Kingdom = 2000.

Source: Calculations by DIW.

Table A.7 Hospital cases by age group – Changes within the age groups (%)

Countries	Baseline scenario					Living-longer-high scenario				
	Age-groups									
	0 - 14	15 - 64	65 - 74	75+	Total	0 - 14	15 - 64	65 - 74	75+	Total
	2020/1999 <sup>*)</sup>									
Belgium	-3,6	3,1	25,9	35,7	11,8	-3,6	3,5	28,4	48,3	14,7
Denmark	-10,7	2,1	48,7	29,2	11,8	-10,7	2,6	53,2	42,9	15,3
Finland	-12,4	-4,8	61,4	50,8	19,0	-12,4	-4,5	65,2	64,8	23,2
France	-5,5	3,7	41,0	33,7	12,1	-5,5	4,1	43,7	44,5	14,3
Germany	-11,7	-0,4	23,0	58,7	13,4	-11,7	0,0	25,8	73,7	16,9
Netherlands	-2,6	10,0	61,3	50,0	23,2	-2,6	10,5	65,5	64,9	26,7
Spain	-13,9	1,3	10,3	42,9	9,0	-13,9	1,7	12,6	56,8	12,2
United Kingdom	-7,7	5,8	35,3	21,6	10,6	-7,7	6,2	38,8	34,7	13,5
Total	-8,5	2,4	30,6	41,9	12,4	-8,5	2,8	33,6	55,4	15,5
	2050/2020									
Belgium	-5,2	-12,4	-6,8	51,0	3,5	-5,2	-11,9	-3,6	80,5	12,1
Denmark	-2,0	-5,2	-10,5	52,2	7,3	-2,0	-4,5	-6,3	88,8	18,2
Finland	-12,3	-11,2	-15,2	38,8	3,2	-12,3	-10,7	-12,2	67,0	14,0
France	-8,6	-9,0	-4,0	63,8	4,8	-8,6	-8,5	-0,8	89,8	11,4
Germany	-13,4	-18,8	-0,8	37,4	-0,7	-13,4	-18,2	2,8	66,1	8,9
Netherlands	1,2	-4,6	-8,7	50,3	6,7	1,2	-3,9	-4,5	87,3	16,9
Spain	-17,4	-27,0	19,7	65,0	4,1	-17,4	-26,4	24,4	96,3	14,6
United Kingdom	-6,9	-8,8	0,9	67,9	7,9	-6,9	-8,3	4,5	106,0	17,8
Total	-9,2	-13,9	-0,6	51,9	3,6	-9,2	-13,4	3,1	82,9	12,8
	2050/1999 <sup>*)</sup>									
Belgium	-8,5	-9,7	17,3	104,9	15,7	-8,5	-8,9	23,7	167,7	28,6
Denmark	-12,4	-3,2	33,1	96,6	19,9	-12,4	-2,1	43,6	169,7	36,3
Finland	-23,2	-15,5	36,9	109,3	22,8	-23,2	-14,7	45,0	175,3	40,5
France	-13,6	-5,7	35,3	119,0	17,5	-13,6	-4,7	42,5	174,3	27,3
Germany	-23,6	-19,1	22,0	118,1	12,6	-23,6	-18,2	29,3	188,4	27,2
Netherlands	-1,5	5,0	47,3	125,4	31,5	-1,5	6,2	58,0	208,7	48,2
Spain	-28,9	-26,0	32,0	135,7	13,4	-28,9	-25,2	40,2	207,9	28,6
United Kingdom	-14,1	-3,5	36,5	104,2	19,3	-14,1	-2,7	45,0	177,4	33,8
Total	-17,0	-11,8	29,9	115,5	16,5	-17,0	-10,9	37,7	184,2	30,3

\*) France and United Kingdom = 2000.

Source: Calculations by DIW.

Table A.8 Age structure of hospital admissions/discharges (%)

Countries	Baseline scenario				Living-longer-high scenario			
	Age-groups							
	0 - 14	15 - 64	65 - 74	75+	0 - 14	15 - 64	65 - 74	75+
	1999 <sup>*)</sup>							
Belgium	14,2	51,3	16,3	18,2	14,2	51,3	16,3	18,2
Denmark	15,8	50,9	13,7	19,7	15,8	50,9	13,7	19,7
Finland	8,5	50,7	16,6	24,2	8,5	50,7	16,6	24,2
France	13,5	57,9	13,8	14,9	13,5	57,9	13,8	14,9
Germany	8,6	56,3	16,7	18,4	8,6	56,3	16,7	18,4
Netherlands	14,8	52,0	16,0	17,2	14,8	52,0	16,0	17,2
Spain	9,7	54,7	17,1	18,4	9,7	54,7	17,1	18,4
United Kingdom	14,7	54,2	13,5	17,6	14,7	54,2	13,5	17,6
Total	11,7	55,3	15,3	17,7	11,7	55,3	15,3	17,7
	2020							
Belgium	12,2	47,3	18,4	22,1	11,9	46,3	18,3	23,5
Denmark	12,6	46,5	18,2	22,7	12,2	45,3	18,1	24,3
Finland	6,2	40,6	22,6	30,7	6,0	39,3	22,3	32,4
France	11,4	53,5	17,3	17,8	11,1	52,7	17,3	18,9
Germany	6,7	49,5	18,1	25,7	6,5	48,2	18,0	27,3
Netherlands	11,7	46,4	21,0	20,9	11,4	45,4	20,9	22,4
Spain	7,7	50,8	17,3	24,2	7,5	49,6	17,2	25,8
United Kingdom	12,3	51,9	16,5	19,4	11,9	50,7	16,5	20,9
Total	9,5	50,4	17,8	22,3	9,3	49,3	17,7	23,8
	2050							
Belgium	11,2	40,0	16,5	32,2	10,1	36,3	15,7	37,9
Denmark	11,5	41,1	15,2	32,2	10,1	36,6	14,4	38,9
Finland	5,3	34,9	18,5	41,2	4,6	30,8	17,2	47,4
France	9,9	46,5	15,9	27,8	9,1	43,3	15,4	32,1
Germany	5,9	40,5	18,1	35,6	5,2	36,2	17,0	41,7
Netherlands	11,1	41,5	18,0	29,5	9,8	37,3	17,1	35,8
Spain	6,1	35,7	19,9	38,3	5,4	31,8	18,6	44,1
United Kingdom	10,6	43,8	15,4	30,1	9,4	39,4	14,6	36,5
Total	8,3	41,9	17,0	32,7	7,5	37,8	16,1	38,6

\*) France and United Kingdom = 2000.

Source: Calculations by DIW.

Table A.9 Changes in the age structure of hospital admissions/discharges (percentage points)

Countries	Baseline scenario				Living-longer-high scenario			
	Age-groups							
	0 - 14	15 - 64	65 - 74	75+	0 - 14	15 - 64	65 - 74	75+
	2020/1999 <sup>*)</sup>							
Belgium	-2,0	-4,0	2,1	3,9	-2,3	-5,0	1,9	5,3
Denmark	-3,2	-4,4	4,5	3,1	-3,6	-5,6	4,5	4,7
Finland	-2,2	-10,2	5,9	6,5	-2,4	-11,4	5,7	8,2
France	-2,1	-4,3	3,6	2,9	-2,3	-5,2	3,5	3,9
Germany	-1,9	-6,9	1,4	7,3	-2,1	-8,1	1,3	8,9
Netherlands	-3,1	-5,6	4,9	3,7	-3,4	-6,7	4,9	5,2
Spain	-2,0	-3,9	0,2	5,7	-2,3	-5,1	0,1	7,3
United Kingdom	-2,4	-2,3	3,0	1,8	-2,8	-3,5	3,0	3,3
Total	-2,2	-4,9	2,5	4,6	-2,4	-6,1	2,4	6,1
	2050/2020							
Belgium	-1,0	-7,3	-1,8	10,1	-1,8	-9,9	-2,6	14,3
Denmark	-1,1	-5,4	-3,0	9,5	-2,1	-8,7	-3,8	14,5
Finland	-0,9	-5,6	-4,0	10,6	-1,4	-8,5	-5,1	15,1
France	-1,5	-7,1	-1,5	10,0	-2,0	-9,4	-1,9	13,3
Germany	-0,9	-9,0	0,0	9,9	-1,3	-12,0	-1,0	14,3
Netherlands	-0,6	-4,9	-3,0	8,5	-1,5	-8,1	-3,8	13,4
Spain	-1,6	-15,2	2,6	14,1	-2,1	-17,7	1,5	18,4
United Kingdom	-1,7	-8,0	-1,1	10,8	-2,5	-11,3	-1,9	15,6
Total	-1,2	-8,5	-0,7	10,4	-1,8	-11,4	-1,5	14,8
	2050/1999 <sup>*)</sup>							
Belgium	-3,0	-11,3	0,2	14,0	-4,1	-15,0	-0,6	19,7
Denmark	-4,3	-9,8	1,5	12,6	-5,6	-14,3	0,7	19,2
Finland	-3,2	-15,8	1,9	17,1	-3,8	-19,9	0,5	23,2
France	-3,6	-11,4	2,1	12,9	-4,3	-14,5	1,6	17,2
Germany	-2,8	-15,8	1,4	17,2	-3,4	-20,1	0,3	23,3
Netherlands	-3,7	-10,5	1,9	12,3	-5,0	-14,7	1,1	18,6
Spain	-3,6	-19,0	2,8	19,9	-4,4	-22,9	1,5	25,7
United Kingdom	-4,1	-10,4	1,9	12,5	-5,3	-14,8	1,1	18,9
Total	-3,4	-13,4	1,8	15,0	-4,2	-17,5	0,9	20,9

\*) France and United Kingdom = 2000.

Source: Calculations by DIW.



Table A.10 Hospital days by age group (million persons)

Countries	Baseline scenario					Living-longer-high scenario				
	Age-groups									
	0 - 14	15 - 64	65 - 74	75+	Total	0 - 14	15 - 64	65 - 74	75+	Total
1999 <sup>*)</sup>										
Belgium	1,1	5,2	2,9	4,6	13,9	1,1	5,2	2,9	4,6	13,9
Denmark	0,6	2,4	1,1	1,9	5,9	0,6	2,4	1,1	1,9	5,9
Finland	0,4	4,6	2,2	7,3	14,6	0,4	4,6	2,2	7,3	14,6
France	7,1	34,9	12,8	10,3	65,1	7,1	34,9	12,8	10,3	65,1
Germany	9,4	87,1	33,0	40,4	169,8	9,4	87,1	33,0	40,4	169,8
Netherlands	1,3	5,6	2,6	3,7	13,2	1,3	5,6	2,6	3,7	13,2
Spain	2,3	17,7	8,4	10,2	38,6	2,3	17,7	8,4	10,2	38,6
United Kingdom	4,9	25,3	8,9	20,3	59,4	4,9	25,3	8,9	20,3	59,4
Total	27,1	182,8	71,9	98,7	380,5	27,1	182,8	71,9	98,7	380,5
2020										
Belgium	1,1	5,6	3,6	6,2	16,6	1,1	5,7	3,7	6,8	17,3
Denmark	0,5	2,5	1,6	2,5	7,1	0,5	2,5	1,6	2,7	7,4
Finland	0,4	4,4	3,6	11,0	19,4	0,4	4,4	3,7	12,0	20,5
France	6,7	37,0	18,0	13,7	75,5	6,7	37,1	18,4	14,9	77,1
Germany	8,3	88,1	40,6	64,1	201,1	8,3	88,5	41,5	70,1	208,4
Netherlands	1,2	6,4	4,3	5,5	17,5	1,2	6,5	4,4	6,1	18,2
Spain	2,0	19,2	9,2	14,8	45,2	2,0	19,3	9,4	16,3	47,0
United Kingdom	4,6	26,8	12,1	24,9	68,4	4,6	26,9	12,4	27,8	71,7
Total	24,8	190,2	93,0	142,7	450,7	24,8	191,0	95,1	156,8	467,7
2050										
Belgium	1,1	4,9	3,4	9,4	18,7	1,1	5,0	3,6	12,3	21,9
Denmark	0,5	2,4	1,4	3,7	8,0	0,5	2,4	1,5	5,0	9,4
Finland	0,3	3,9	3,1	15,3	22,6	0,3	3,9	3,2	20,1	27,6
France	6,2	33,6	17,3	22,5	79,6	6,2	34,0	18,2	28,2	86,6
Germany	7,2	71,2	40,3	88,0	206,7	7,2	72,0	42,6	116,4	238,3
Netherlands	1,3	6,1	3,9	8,5	19,7	1,3	6,2	4,2	11,8	23,4
Spain	1,6	13,9	11,0	24,4	51,0	1,6	14,1	11,7	32,1	59,6
United Kingdom	4,2	24,5	12,2	43,5	84,4	4,2	24,7	12,9	60,9	102,8
Total	22,3	160,5	92,5	215,2	490,6	22,3	162,3	98,0	286,8	569,5

\*) France and United Kingdom = 2000.

Source: Calculations by DIW.

*Table A.11 Hospital days by age group – Changes within the age group  
(per 1000 persons)*

Countries	Baseline scenario					Living-longer-high scenario				
	Age-groups									
	0 - 14	15 - 64	65 - 74	75+	Total	0 - 14	15 - 64	65 - 74	75+	Total
	2020/1999 <sup>*)</sup>									
Belgium	- 26	398	742	1 643	2 758	- 26	421	815	2 223	3 433
Denmark	- 60	139	508	588	1 175	- 60	153	554	835	1 482
Finland	- 52	- 222	1 373	3 714	4 812	- 52	- 207	1 458	4 739	5 937
France	- 393	2 117	5 242	3 466	10 433	- 393	2 269	5 591	4 577	12 043
Germany	- 1 076	1 071	7 602	23 697	31 294	- 1 076	1 468	8 495	29 740	38 627
Netherlands	- 34	803	1 629	1 841	4 239	- 34	836	1 743	2 419	4 964
Spain	- 343	1 526	862	4 565	6 609	- 343	1 616	1 056	6 058	8 387
United Kingdom	- 361	1 524	3 198	4 561	8 922	- 361	1 614	3 515	7 527	12 295
Total	- 2 345	7 356	21 157	44 074	70 243	- 2 345	8 170	23 227	58 116	87 169
	2050/2020									
Belgium	- 59	- 751	- 246	3 186	2 130	- 59	- 720	- 134	5 496	4 583
Denmark	- 11	- 140	- 168	1 193	874	- 11	- 121	- 107	2 215	1 977
Finland	- 46	- 490	- 547	4 277	3 195	- 46	- 471	- 451	8 078	7 111
France	- 579	- 3 389	- 728	8 769	4 074	- 579	- 3 164	- 154	13 346	9 450
Germany	- 1 118	- 16 921	- 333	23 947	5 575	- 1 118	- 16 501	1 159	46 305	29 844
Netherlands	15	- 347	- 370	2 961	2 259	15	- 297	- 195	5 696	5 217
Spain	- 337	- 5 308	1 819	9 565	5 738	- 337	- 5 209	2 303	15 813	12 569
United Kingdom	- 318	- 2 327	42	18 603	15 999	- 318	- 2 210	504	33 087	31 062
Total	- 2 454	- 29 673	- 532	72 501	39 843	- 2 454	- 28 693	2 924	130 036	101 813
	2050/1999 <sup>*)</sup>									
Belgium	- 85	- 352	496	4 829	4 888	- 85	- 299	681	7 719	8 016
Denmark	- 71	- 1	340	1 780	2 048	- 71	32	447	3 050	3 459
Finland	- 98	- 712	826	7 991	8 007	- 98	- 678	1 006	12 817	13 048
France	- 972	- 1 271	4 515	12 236	14 507	- 972	- 895	5 437	17 923	21 493
Germany	- 2 194	- 15 850	7 269	47 644	36 869	- 2 194	- 15 033	9 653	76 045	68 471
Netherlands	- 19	456	1 259	4 802	6 498	- 19	539	1 548	8 114	10 182
Spain	- 680	- 3 783	2 681	14 129	12 347	- 680	- 3 594	3 359	21 871	20 956
United Kingdom	- 680	- 803	3 239	23 164	24 921	- 680	- 596	4 019	40 614	43 357
Total	- 4 798	- 22 317	20 625	116 575	110 085	- 4 798	- 20 523	26 151	188 152	188 982

\*) France and United Kingdom = 2000.

Source: Calculations by DIW.

*Table A.12 Development of hospital days in the age groups – Changes within the age groups (%)*

Countries	Baseline scenario					Living-longer-high scenario				
	Age-groups									
	0 - 14	15 - 64	65 - 74	75+	Total	0 - 14	15 - 64	65 - 74	75+	Total
	2020/1999 <sup>*)</sup>									
Belgium	-2,3	7,6	25,9	35,7	19,9	-2,3	8,0	28,4	48,3	24,8
Denmark	-10,5	5,9	48,4	30,8	19,9	-10,5	6,4	52,7	43,7	25,1
Finland	-12,4	-4,8	61,4	50,8	33,0	-12,4	-4,5	65,2	64,8	40,7
France	-5,5	6,1	41,0	33,7	16,0	-5,5	6,5	43,7	44,5	18,5
Germany	-11,5	1,2	23,0	58,7	18,4	-11,5	1,7	25,8	73,7	22,8
Netherlands	-2,6	14,3	61,5	49,8	32,0	-2,6	14,9	65,8	65,4	37,5
Spain	-14,9	8,6	10,3	44,6	17,1	-14,9	9,1	12,6	59,2	21,7
United Kingdom	-7,4	6,0	35,9	22,5	15,0	-7,4	6,4	39,4	37,1	20,7
Total	-8,6	4,0	29,4	44,7	18,5	-8,6	4,5	32,3	58,9	22,9
	2050/2020									
Belgium	-5,3	-13,3	-6,8	51,0	12,8	-5,3	-12,7	-3,6	80,5	26,5
Denmark	-2,2	-5,6	-10,8	47,8	12,3	-2,2	-4,8	-6,6	80,8	26,8
Finland	-12,3	-11,2	-15,2	38,8	16,5	-12,3	-10,7	-12,2	67,0	34,7
France	-8,6	-9,2	-4,0	63,8	5,4	-8,6	-8,5	-0,8	89,8	12,3
Germany	-13,5	-19,2	-0,8	37,4	2,8	-13,5	-18,6	2,8	66,1	14,3
Netherlands	1,2	-5,4	-8,7	53,5	12,9	1,2	-4,6	-4,5	93,2	28,7
Spain	-17,1	-27,6	19,7	64,6	12,7	-17,1	-27,0	24,4	97,1	26,7
United Kingdom	-7,0	-8,7	0,3	74,9	23,4	-7,0	-8,2	4,1	118,9	43,3
Total	-9,9	-15,6	-0,6	50,8	8,8	-9,9	-15,0	3,1	82,9	21,8
	2050/1999 <sup>*)</sup>									
Belgium	-7,5	-6,7	17,3	104,9	35,3	-7,5	-5,7	23,7	167,7	57,8
Denmark	-12,5	0,0	32,4	93,3	34,7	-12,5	1,4	42,6	159,9	58,5
Finland	-23,2	-15,5	36,9	109,3	55,0	-23,2	-14,7	45,0	175,3	89,5
France	-13,6	-3,6	35,3	119,0	22,3	-13,6	-2,6	42,5	174,3	33,0
Germany	-23,4	-18,2	22,0	118,1	21,7	-23,4	-17,3	29,3	188,4	40,3
Netherlands	-1,5	8,1	47,6	129,9	49,1	-1,5	9,6	58,4	219,6	76,9
Spain	-29,4	-21,4	32,0	138,1	32,0	-29,4	-20,3	40,2	213,8	54,3
United Kingdom	-13,8	-3,2	36,3	114,2	41,9	-13,8	-2,4	45,1	200,2	72,9
Total	-17,7	-12,2	28,7	118,1	28,9	-17,7	-11,2	36,4	190,7	49,7

<sup>\*)</sup> France and United Kingdom = 2000.  
Source: Calculations by DIW.

Table A.13 Age structure of hospital days (%)

Countries	Baseline scenario				Living-longer-high scenario			
	Age-groups							
	0 - 14	15 - 64	65 - 74	75+	0 - 14	15 - 64	65 - 74	75+
	1999 <sup>*)</sup>							
Belgium	8,2	37,9	20,7	33,2	8,2	37,9	20,7	33,2
Denmark	9,6	40,3	17,8	32,3	9,6	40,3	17,8	32,3
Finland	2,9	31,6	15,3	50,2	2,9	31,6	15,3	50,2
France	11,0	53,6	19,7	15,8	10,9	53,6	19,7	15,8
Germany	5,5	51,3	19,4	23,8	5,5	51,3	19,4	23,8
Netherlands	9,7	42,4	20,0	27,9	9,7	42,4	20,0	27,9
Spain	6,0	45,9	21,7	26,5	6,0	45,9	21,7	26,5
United Kingdom	8,3	42,6	15,0	34,1	8,3	42,6	15,0	34,1
Total	7,1	48,0	18,9	25,9	7,1	48,0	18,9	25,9
	2020							
Belgium	6,7	34,0	21,7	37,6	6,4	32,8	21,3	39,5
Denmark	7,2	35,6	22,0	35,2	6,9	34,3	21,7	37,1
Finland	1,9	22,6	18,6	56,9	1,8	21,4	18,0	58,8
France	8,9	49,0	23,9	18,2	8,7	48,2	23,8	19,3
Germany	4,1	43,8	20,2	31,9	4,0	42,5	19,9	33,6
Netherlands	7,1	36,7	24,5	31,7	6,8	35,5	24,1	33,6
Spain	4,3	42,5	20,4	32,7	4,2	41,1	20,0	34,7
United Kingdom	6,7	39,3	17,7	36,4	6,3	37,6	17,3	38,8
Total	5,5	42,2	20,6	31,7	5,3	40,8	20,3	33,5
	2050							
Belgium	5,6	26,1	18,0	50,3	4,8	22,6	16,2	56,3
Denmark	6,3	29,9	17,5	46,4	5,3	25,7	16,0	52,9
Finland	1,4	17,2	13,6	67,8	1,2	14,2	11,7	72,9
France	7,7	42,2	21,8	28,3	7,1	39,2	21,1	32,6
Germany	3,5	34,5	19,5	42,6	3,0	30,2	17,9	48,9
Netherlands	6,4	30,8	19,8	43,0	5,4	26,3	17,9	50,4
Spain	3,2	27,3	21,7	47,8	2,7	23,7	19,7	53,9
United Kingdom	5,0	29,1	14,4	51,5	4,1	24,1	12,6	59,2
Total	4,6	32,7	18,9	43,9	3,9	28,5	17,2	50,4

\*) France and United Kingdom = 2000.

Source: Calculations by DIW.

Table A.14 Changes in the age structure of hospital days (percentage points)

Countries	Baseline scenario				Living-longer-high scenario			
	Age-groups							
	0 - 14	15 - 64	65 - 74	75+	0 - 14	15 - 64	65 - 74	75+
	2020/1999 <sup>*)</sup>							
Belgium	-1,5	-3,9	1,0	4,4	-1,8	-5,1	0,6	6,3
Denmark	-2,4	-4,7	4,2	2,9	-2,7	-6,0	3,9	4,8
Finland	-1,0	-9,0	3,3	6,7	-1,1	-10,2	2,7	8,6
France	-2,0	-4,6	4,2	2,4	-2,2	-5,4	4,2	3,5
Germany	-1,4	-7,4	0,8	8,1	-1,5	-8,8	0,5	9,9
Netherlands	-2,5	-5,7	4,5	3,8	-2,8	-7,0	4,1	5,7
Spain	-1,6	-3,3	-1,3	6,2	-1,8	-4,7	-1,6	8,2
United Kingdom	-1,6	-3,3	2,7	2,2	-1,9	-5,1	2,3	4,6
Total	-1,6	-5,9	1,8	5,7	-1,8	-7,2	1,4	7,6
	2050/2020							
Belgium	-1,1	-7,9	-3,8	12,7	-1,6	-10,2	-5,1	16,9
Denmark	-0,9	-5,7	-4,5	11,1	-1,6	-8,5	-5,7	15,8
Finland	-0,5	-5,4	-5,1	10,9	-0,6	-7,2	-6,3	14,1
France	-1,2	-6,8	-2,1	10,1	-1,6	-8,9	-2,8	13,3
Germany	-0,7	-9,4	-0,7	10,7	-1,0	-12,2	-2,0	15,2
Netherlands	-0,7	-6,0	-4,7	11,4	-1,5	-9,2	-6,2	16,8
Spain	-1,2	-15,2	1,3	15,1	-1,4	-17,4	-0,4	19,2
United Kingdom	-1,6	-10,2	-3,3	15,2	-2,2	-13,5	-4,7	20,5
Total	-0,9	-9,5	-1,8	12,2	-1,4	-12,3	-3,1	16,8
	2050/1999 <sup>*)</sup>							
Belgium	-2,6	-11,8	-2,7	17,1	-3,4	-15,2	-4,5	23,1
Denmark	-3,4	-10,4	-0,3	14,1	-4,3	-14,5	-1,8	20,6
Finland	-1,5	-14,4	-1,8	17,6	-1,7	-17,4	-3,6	22,7
France	-3,2	-11,4	2,1	12,5	-3,8	-14,3	1,4	16,8
Germany	-2,0	-16,8	0,1	18,8	-2,5	-21,0	-1,5	25,1
Netherlands	-3,3	-11,7	-0,2	15,1	-4,3	-16,1	-2,1	22,5
Spain	-2,8	-18,5	0,0	21,3	-3,2	-22,2	-2,0	27,4
United Kingdom	-3,2	-13,5	-0,6	17,4	-4,1	-18,5	-2,4	25,1
Total	-2,6	-15,3	0,0	17,9	-3,2	-19,5	-1,7	24,4

\*) France and United Kingdom = 2000.

Source: Calculations by DIW.

*Table A.15 Development of contacts with a doctor (2001 = 100)*

Countries	2010	2020	2030	2040	2050
	Baseline scenario				
Belgium <sup>1)</sup> (GP)	105	110	117	119	115
Finland <sup>2)</sup> (GP+SP)	103	105	105	102	98
Netherlands (GP)	107	112	117	118	117
Spain <sup>1)</sup> (GP+SP)	104	105	106	105	100
United Kingdom <sup>3)</sup> (GP)	103	107	110	111	109
Total	104	107	109	109	106
	Living-longer-high scenario				
Belgium <sup>1)</sup> (GP)	106	113	122	129	128
Finland <sup>2)</sup> (GP+SP)	103	107	108	107	104
Netherlands (GP)	107	114	121	126	127
Spain <sup>1)</sup> (GP+SP)	104	107	110	111	110
United Kingdom <sup>3)</sup> (GP)	104	109	114	117	117
Total	104	109	113	116	115
Average population based on: 1) 1997, 2) 1996, 3) 2000.					
GP = General practitioner, SP = Specialist.					
Source: Calculations by DIW.					

Table A.16 Contacts with a doctor by age group per year (millions)

Countries	Baseline scenario					Living-longer-high scenario				
	Age-groups									
	0 - 14 <sup>4)</sup>	15 - 64 <sup>5)</sup>	65 - 74	75+	Total	0 - 14 <sup>4)</sup>	15 - 64 <sup>5)</sup>	65 - 74	75+	Total
2001										
Belgium <sup>1)</sup> (GP)	6,3	28,2	8,5	10,8	53,7	6,3	28,2	8,5	10,8	53,8
Finland <sup>2)</sup> (GP+SP)	3,1	13,5	2,4	1,6	20,6	3,1	13,5	2,4	1,6	20,6
Netherlands (GP)	9,4	41,1	6,4	7,1	64,1	9,4	41,1	6,4	7,1	64,1
Spain <sup>1)</sup> (GP+SP)	55,0	205,4	42,7	47,1	350,1	55,0	205,4	42,7	47,1	350,2
United Kingdom <sup>3)</sup> (GP)	44,7	196,0	34,9	33,4	308,9	44,7	196,0	34,9	33,5	309,1
Total	118,5	484,2	94,8	99,9	797,4	118,5	484,2	94,9	100,1	797,7
2020										
Belgium <sup>1)</sup> (GP)	5,7	28,9	10,8	14,0	59,3	5,7	29,0	11,0	15,3	61,0
Finland <sup>2)</sup> (GP+SP)	2,8	12,8	3,8	2,3	21,7	2,8	12,8	3,9	2,5	22,0
Netherlands (GP)	9,2	42,4	10,2	10,1	71,9	9,2	42,6	10,5	11,1	73,3
Spain <sup>1)</sup> (GP+SP)	49,8	210,1	47,0	61,7	368,6	49,8	210,9	48,0	67,4	376,1
United Kingdom <sup>3)</sup> (GP)	40,1	203,2	47,1	40,3	330,6	40,1	203,8	48,3	44,3	336,4
Total	107,6	497,3	118,9	128,3	852,2	107,6	499,0	121,6	140,5	868,8
2050										
Belgium <sup>1)</sup> (GP)	5,5	25,2	10,1	21,1	61,8	5,5	25,4	10,6	27,6	69,1
Finland <sup>2)</sup> (GP+SP)	2,5	11,4	3,2	3,2	20,2	2,5	11,5	3,4	4,1	21,5
Netherlands (GP)	9,4	41,1	9,3	15,1	74,9	9,4	41,5	10,0	20,8	81,6
Spain <sup>1)</sup> (GP+SP)	40,4	152,4	56,3	102,1	351,2	40,4	154,1	59,7	131,4	385,7
United Kingdom <sup>3)</sup> (GP)	37,7	184,9	47,7	66,2	336,5	37,7	186,3	50,6	87,8	362,4
Total	95,4	415,0	126,6	207,6	844,7	95,4	418,8	134,4	271,6	920,2

Average population based on: 1) 1997, 2) 1996, 3) 2000.- 4) Netherlands = 0-17 years.- 5) Netherlands = 18-64 years.  
GP = General practitioner; SP = Specialist.  
Source: Calculations by DIW.

*Table A.17 Contacts with a doctor by age group – Changes within the age group (per 1000 persons)*

Countries	Baseline scenario					Living-longer-high scenario				
	Age-groups									
	0 - 14 <sup>4)</sup>	15 - 64 <sup>5)</sup>	65 - 74	75+	Total	0 - 14 <sup>4)</sup>	15 - 64 <sup>5)</sup>	65 - 74	75+	Total
2020/2001										
Belgium <sup>1)</sup> (GP)	- 540	644	2 315	3 173	5 592	- 540	741	2 527	4 448	7 175
Finland <sup>2)</sup> (GP+SP)	- 342	- 702	1 443	672	1 072	- 342	- 653	1 531	880	1 417
Netherlands (GP)	- 250	1 341	3 761	3 001	7 854	- 250	1 490	4 021	4 005	9 266
Spain <sup>1)</sup> (GP+SP)	- 5 176	4 694	4 360	14 637	18 515	- 5 176	5 497	5 325	20 232	25 878
United Kingdom <sup>3)</sup> (GP)	- 4 587	7 151	12 215	6 920	21 700	- 4 587	7 736	13 367	10 845	27 360
Total	- 10 894	13 129	24 094	28 404	54 733	- 10 894	14 811	26 770	40 410	71 097
2050/2020										
Belgium <sup>1)</sup> (GP)	- 250	- 3 643	- 736	7 124	2 495	- 250	- 3 511	- 400	12 291	8 130
Finland <sup>2)</sup> (GP+SP)	- 345	- 1 403	- 576	881	- 1 442	- 345	- 1 339	- 475	1 664	- 495
Netherlands (GP)	178	- 1 343	- 887	5 060	3 007	178	- 1 120	- 488	9 664	8 235
Spain <sup>1)</sup> (GP+SP)	- 9 367	- 57 654	9 265	40 395	- 17 360	- 9 367	- 56 777	11 733	63 983	9 573
United Kingdom <sup>3)</sup> (GP)	- 2 358	- 18 280	623	25 841	5 826	- 2 358	- 17 510	2 360	43 467	25 960
Total	- 12 141	- 82 323	7 690	79 301	- 7 473	- 12 141	- 80 257	12 730	131 070	51 402
2050/2001										
Belgium <sup>1)</sup> (GP)	- 790	- 2 999	1 579	10 298	8 087	- 790	- 2 770	2 127	16 738	15 305
Finland <sup>2)</sup> (GP+SP)	- 687	- 2 104	868	1 554	- 370	- 687	- 1 992	1 056	2 544	922
Netherlands (GP)	- 72	- 2	2 874	8 061	10 861	- 72	371	3 533	13 669	17 501
Spain <sup>1)</sup> (GP+SP)	- 14 543	- 52 960	13 625	55 032	1 155	- 14 543	- 51 280	17 058	84 216	35 451
United Kingdom <sup>3)</sup> (GP)	- 6 944	- 11 129	12 839	32 761	27 526	- 6 944	- 9 774	15 727	54 312	53 320
Total	- 23 035	- 69 194	31 784	107 705	47 260	- 23 035	- 65 446	39 501	171 480	122 500

Average population based on: 1) 1997, 2) 1996, 3) 2000.- 4) Netherlands = 0-17 years.- 5) Netherlands = 18-64 years.  
 GP = General practitioner; SP = Specialist.  
 Source: Calculations by DIW.



Table A.18 Contacts with a doctor by age group – Changes within the age groups (%)

Countries	Baseline scenario					Living-longer-high scenario				
	Age-groups									
	0 - 14 <sup>4)</sup>	15 - 64 <sup>5)</sup>	65 - 74	75+	Total	0 - 14 <sup>4)</sup>	15 - 64 <sup>5)</sup>	65 - 74	75+	Total
2020/2001										
Belgium <sup>1)</sup> (GP)	-8,6	2,3	27,3	29,4	10,4	-8,6	2,6	29,7	41,1	13,3
Finland <sup>2)</sup> (GP+SP)	-10,9	-5,2	61,3	42,0	5,2	-10,9	-4,8	65,0	54,9	6,9
Netherlands (GP)	-2,6	3,3	58,3	42,3	12,3	-2,6	3,6	62,3	56,5	14,5
Spain <sup>1)</sup> (GP+SP)	-9,4	2,3	10,2	31,1	5,3	-9,4	2,7	12,5	42,9	7,4
United Kingdom <sup>3)</sup> (GP)	-10,3	3,6	35,0	20,7	7,0	-10,3	3,9	38,3	32,4	8,9
Total	-9,2	2,7	25,4	28,4	6,9	-9,2	3,1	28,2	40,4	8,9
2050/2020										
Belgium <sup>1)</sup> (GP)	-4,4	-12,6	-6,8	51,0	4,2	-4,4	-12,1	-3,6	80,5	13,3
Finland <sup>2)</sup> (GP+SP)	-12,3	-11,0	-15,2	38,8	-6,7	-12,3	-10,4	-12,2	67,0	-2,2
Netherlands (GP)	1,9	-3,2	-8,7	50,2	4,2	1,9	-2,6	-4,7	87,1	11,2
Spain <sup>1)</sup> (GP+SP)	-18,8	-27,4	19,7	65,5	-4,7	-18,8	-26,9	24,4	95,0	2,5
United Kingdom <sup>3)</sup> (GP)	-5,9	-9,0	1,3	64,1	1,8	-5,9	-8,6	4,9	98,1	7,7
Total	-11,3	-16,6	6,5	61,8	-0,9	-11,3	-16,1	10,5	93,3	5,9
2050/2001										
Belgium <sup>1)</sup> (GP)	-12,6	-10,6	18,6	95,4	15,0	-12,6	-9,8	25,0	154,8	28,5
Finland <sup>2)</sup> (GP+SP)	-21,8	-15,6	36,9	97,2	-1,8	-21,8	-14,8	44,8	158,8	4,5
Netherlands (GP)	-0,8	0,0	44,6	113,7	17,0	-0,8	0,9	54,8	192,9	27,3
Spain <sup>1)</sup> (GP+SP)	-26,5	-25,8	31,9	117,0	0,3	-26,5	-25,0	40,0	178,6	10,1
United Kingdom <sup>3)</sup> (GP)	-15,5	-5,7	36,8	98,1	8,9	-15,5	-5,0	45,1	162,3	17,3
Total	-19,4	-14,3	33,5	107,8	5,9	-19,4	-13,5	41,6	171,3	15,4

Average population based on: 1) 1997, 2) 1996, 3) 2000.- 4) Netherlands = 0-17 years.- 5) Netherlands = 18-64 years.  
GP = General practitioner; SP = Specialist.  
Source: Calculations by DIW.

Table A.19 Changes in the age structure of contacts with a doctor (percentage points)

Countries	Baseline scenario				Living-longer-high scenario			
	Age-groups							
	0 - 14 <sup>4)</sup>	15 - 64 <sup>5)</sup>	65 - 74	75+	0 - 14 <sup>4)</sup>	15 - 64 <sup>5)</sup>	65 - 74	75+
	2020/2001							
Belgium <sup>1)</sup> (GP)	-2,0	-3,9	2,4	3,5	-2,3	-5,0	2,3	4,9
Finland <sup>2)</sup> (GP+SP)	-2,3	-6,5	6,1	2,7	-2,5	-7,2	6,2	3,5
Netherlands (GP)	-2,0	-5,1	4,1	3,0	-2,2	-6,1	4,2	4,1
Spain <sup>1)</sup> (GP+SP)	-2,2	-1,7	0,6	3,3	-2,5	-2,6	0,6	4,5
United Kingdom <sup>3)</sup> (GP)	-2,3	-2,0	3,0	1,4	-2,5	-2,9	3,1	2,3
Total	-2,2	-2,4	2,1	2,5	-2,5	-3,3	2,1	3,6
	2050/2020							
Belgium <sup>1)</sup> (GP)	-0,8	-7,9	-1,9	10,6	-1,5	-10,7	-2,7	14,8
Finland <sup>2)</sup> (GP+SP)	-0,8	-2,7	-1,6	5,1	-1,3	-4,9	-1,8	8,0
Netherlands (GP)	-0,3	-4,2	-1,8	6,2	-1,0	-7,2	-2,0	10,3
Spain <sup>1)</sup> (GP+SP)	-2,0	-13,6	3,3	12,3	-2,8	-16,1	2,7	16,1
United Kingdom <sup>3)</sup> (GP)	-0,9	-6,5	-0,1	7,5	-1,5	-9,2	-0,4	11,1
Total	-1,3	-9,2	1,0	9,5	-2,0	-11,9	0,6	13,3
	2050/2001							
Belgium <sup>1)</sup> (GP)	-2,8	-11,7	0,5	14,0	-3,7	-15,6	-0,4	19,8
Finland <sup>2)</sup> (GP+SP)	-3,1	-9,2	4,5	7,8	-3,8	-12,1	4,4	11,5
Netherlands (GP)	-2,2	-9,3	2,4	9,2	-3,2	-13,3	2,2	14,4
Spain <sup>1)</sup> (GP+SP)	-4,2	-15,3	3,8	15,6	-5,2	-18,7	3,3	20,6
United Kingdom <sup>3)</sup> (GP)	-3,2	-8,5	2,9	8,9	-4,0	-12,0	2,7	13,4
Total	-3,6	-11,6	3,1	12,0	-4,5	-15,2	2,7	17,0

Average population based on: 1) 1997, 2) 1996, 3) 2000.- 4) Netherlands = 0-17 years.- 5) Netherlands = 18-64 years.  
 GP = General practitioner; SP = Specialist.  
 Source: Calculations by DIW.

*Table A.20 Long-term care recipients in institutions by age group – Changes within the age groups (per 1000 persons)*

Countries	Baseline scenario				Living-longer-high scenario			
	Age-groups							
	0 - 59 <sup>1)2)</sup>	60 - 79 <sup>2)</sup>	80+	Total	0 - 59 <sup>1)2)</sup>	60 - 79 <sup>2)</sup>	80+	Total
	2020/2001							
Belgium	- 0,1	3,7	41,5	45,0	- 0,1	4,4	57,9	62,2
Denmark	- 0,2	4,3	3,0	7,1	- 0,2	4,9	6,5	11,2
Finland	- 0,6	4,9	11,2	15,5	- 0,6	5,3	15,8	20,6
France	- 1,0	15,1	121,4	135,5	- 0,9	17,3	163,2	179,5
Germany	0,8	26,9	224,8	252,6	1,0	33,1	318,7	352,9
Netherlands	0,0	19,3	48,9	68,2	0,0	21,8	78,6	100,5
Total	- 1,1	74,1	450,8	523,8	- 0,7	86,8	640,7	726,8
	2050/2020							
Belgium	- 0,2	2,9	77,3	80,0	- 0,2	4,7	159,0	163,5
Denmark	- 0,3	0,6	19,1	19,3	- 0,3	1,7	38,0	39,4
Finland	- 0,6	- 1,4	23,5	21,5	- 0,6	- 0,8	46,3	44,9
France	- 3,3	16,6	237,2	250,4	- 3,2	22,4	435,2	454,4
Germany	- 14,4	9,0	441,5	436,1	- 14,2	20,8	902,4	909,0
Netherlands	- 0,1	2,7	161,6	164,1	- 0,1	8,0	341,9	349,9
Total	- 19,0	30,3	960,1	971,4	- 18,6	57,0	1 922,8	1 961,1
	2050/2001							
Belgium	- 0,4	6,6	118,7	125,0	- 0,4	9,1	216,9	225,7
Denmark	- 0,5	4,9	22,1	26,4	- 0,5	6,6	44,4	50,6
Finland	- 1,2	3,4	34,7	37,0	- 1,2	4,6	62,1	65,5
France	- 4,3	31,6	358,6	385,9	- 4,1	39,6	598,3	633,9
Germany	- 13,6	35,9	666,3	688,7	- 13,2	54,0	1 221,1	1 261,9
Netherlands	- 0,1	22,0	210,4	232,3	- 0,1	29,9	420,6	450,4
Total	- 20,1	104,4	1 410,9	1 495,2	- 19,3	143,8	2 563,5	2 688,0

1) Denmark and France = 15-59 years.- 2) Netherlands = 0-64 years and 65-79 years.

Source: Calculations by DIW.

*Table A.21 Long-term care recipients in institutions by age group – Changes within the age groups (%)*

Countries	Baseline scenario				Living-longer-high scenario			
	Age-groups							
	0 - 59 <sup>1)2)</sup>	60 - 79 <sup>2)</sup>	80+	Total	0 - 59 <sup>1)2)</sup>	60 - 79 <sup>2)</sup>	80+	Total
	2020/2001							
Belgium	- 6	17	64	50	- 6	20	89	69
Denmark	- 3	46	16	20	- 3	52	34	32
Finland	- 9	50	55	42	- 9	54	77	56
France	- 3	23	63	46	- 2	26	84	61
Germany	1	18	58	41	1	22	82	58
Netherlands	0	51	37	39	0	57	60	58
Total	- 1	25	55	42	- 1	29	78	58
	2050/2020							
Belgium	- 10	12	72	59	- 9	18	129	108
Denmark	- 5	4	87	46	- 4	12	149	85
Finland	- 11	- 10	74	41	- 11	- 5	128	79
France	- 9	20	75	58	- 9	27	122	95
Germany	- 20	5	72	50	- 20	11	128	94
Netherlands	- 2	5	90	68	- 1	13	163	127
Total	- 15	8	76	55	- 15	15	132	99
	2050/2001							
Belgium	- 15	30	182	140	- 15	42	331	252
Denmark	- 8	52	117	75	- 7	71	235	144
Finland	- 19	35	170	101	- 18	47	304	179
France	- 12	48	186	130	- 11	60	309	214
Germany	- 19	23	171	112	- 19	35	314	206
Netherlands	- 2	58	161	133	- 1	78	320	258
Total	- 16	35	173	120	- 15	48	313	216
1) Denmark and France = 15-59 years.- 2) Netherlands = 0-64 years and 65-79 years.								
Source: Ccalculations by DIW.								

Table A.22 Age structure of long-term care recipients in institutions (%)

Countries	Baseline scenario			Living-longer-high scenario		
	Age-groups					
	0 - 59 <sup>1)2)</sup>	60 - 79 <sup>2)</sup>	80+	0 - 59 <sup>1)2)</sup>	60 - 79 <sup>2)</sup>	80+
	2001					
Belgium	3	24	73	3	24	73
Denmark	20	27	54	20	27	54
Finland	17	27	56	17	27	56
France	12	22	65	12	22	65
Germany	11	25	64	11	25	64
Netherlands	3	22	75	3	22	75
Total	10	24	66	10	24	66
	2020					
Belgium	2	19	79	1	17	81
Denmark	16	32	52	15	31	55
Finland	11	28	61	10	26	64
France	8	19	73	8	18	75
Germany	8	21	71	7	19	73
Netherlands	2	24	74	2	22	76
Total	7	21	72	6	20	74
	2050					
Belgium	1	13	86	1	10	90
Denmark	10	23	67	8	19	74
Finland	7	18	75	5	14	81
France	5	14	81	4	11	85
Germany	4	15	81	3	11	86
Netherlands	1	15	84	1	11	88
Total	4	15	81	3	11	86

1) Denmark and France = 15-59 years.- 2) Netherlands = 0-64 years and 65-79 years.  
Source: Calculations by DIW.

*Table A.23 Changes in the age structure of long-term care recipients in institutions (percentage points)*

Countries	Baseline scenario			Living-longer-high scenario		
	Age-groups					
	0 - 59 <sup>1)2)</sup>	60 - 79 <sup>2)</sup>	80+	0 - 59	60 - 79	80+
	2020/2001					
Belgium	-1,0	-5,4	6,4	-1,2	-7,1	8,2
Denmark	-3,8	5,7	-1,9	-5,1	4,2	1,0
Finland	-6,3	1,4	4,9	-7,2	-0,3	7,5
France	-4,1	-3,6	7,7	-4,9	-4,8	9,7
Germany	-3,2	-4,2	7,4	-4,1	-5,7	9,8
Netherlands	-0,9	1,8	-1,0	-1,1	0,0	1,1
Total	-3,1	-2,9	6,0	-3,8	-4,4	8,3
	2050/2020					
Belgium	-0,7	-5,7	6,4	-0,8	-7,4	8,3
Denmark	-5,5	-9,2	14,8	-7,0	-12,1	19,1
Finland	-4,1	-10,2	14,2	-5,0	-12,4	17,4
France	-3,5	-4,5	8,0	-4,0	-6,2	10,2
Germany	-3,8	-6,3	10,1	-4,3	-8,3	12,6
Netherlands	-0,9	-8,9	9,8	-1,1	-10,9	12,0
Total	-3,2	-6,4	9,6	-3,7	-8,3	12,0
	2050/2001					
Belgium	-1,7	-11,1	12,8	-2,0	-14,5	16,5
Denmark	-9,3	-3,5	12,8	-12,2	-7,9	20,1
Finland	-10,3	-8,8	19,1	-12,2	-12,7	24,9
France	-7,7	-8,1	15,7	-8,9	-11,0	19,9
Germany	-7,1	-10,5	17,6	-8,4	-14,0	22,4
Netherlands	-1,8	-7,1	8,8	-2,2	-10,9	13,1
Total	-6,3	-9,3	15,6	-7,5	-12,7	20,2

1) Denmark and France = 15-59 years.- 2) Netherlands = 0-64 years and 65-79 years.  
Source: Calculations by DIW.

Table A.24 Long-term care recipients at home by age group (per 1000 persons)

Countries	Baseline scenario				Living-longer-high scenario			
	Age-groups							
	0 - 59 <sup>1)</sup>	60 - 79	80+	Total	0 - 59 <sup>1)</sup>	60 - 79	80+	Total
	2001							
Belgium	11	48	64	123	11	48	64	123
Finland	13	29	36	78	13	29	36	78
France	124	212	306	642	124	212	307	643
Germany	272	475	591	1 338	272	475	591	1 338
Total	420	764	998	2 182	420	764	999	2 183
	2020							
Belgium	11	57	101	169	11	59	115	184
Finland	12	43	55	110	12	45	62	119
France	121	276	490	887	121	283	553	957
Germany	270	555	966	1 791	271	573	1 102	1 946
Total	413	932	1 611	2 956	414	959	1 832	3 205
	2050							
Belgium	10	62	168	239	10	67	246	322
Finland	11	39	92	142	11	42	133	186
France	110	306	857	1 272	110	327	1 215	1 653
Germany	219	577	1 591	2 387	220	629	2 357	3 206
Total	349	983	2 709	4 041	351	1 065	3 951	5 367
1) France = 15-59 years.								
Source: Calculations by DIW.								

*Table A.25 Long-term care recipients at home by age group – Changes within the age groups (per 1000 persons)*

Countries	Baseline scenario				Living-longer-high scenario			
	Age-groups							
	0 - 59 <sup>1)</sup>	60 - 79	80+	Total	0 - 59 <sup>1)</sup>	60 - 79	80+	Total
	2020/2001							
Belgium	- 0,7	9,2	37,3	45,8	- 0,6	10,7	51,2	61,2
Finland	- 1,2	14,3	18,4	31,6	- 1,1	15,7	25,7	40,2
France	- 3,4	64,4	183,7	244,8	- 3,1	70,7	246,1	313,8
Germany	- 1,6	79,8	374,2	452,4	- 1,0	97,9	510,3	607,2
Total	- 6,8	167,8	613,6	774,6	- 5,8	195,0	833,3	1 022,5
	2050/2020							
Belgium	- 1,0	4,7	67,2	70,9	- 1,0	8,4	130,7	138,1
Finland	- 1,3	- 4,2	37,7	32,2	- 1,2	- 2,4	71,1	67,5
France	- 11,2	29,3	367,1	385,2	- 10,8	44,3	662,2	695,7
Germany	- 51,3	21,9	625,8	596,4	- 50,8	55,7	1 255,2	1 260,2
Total	- 64,9	51,7	1 097,8	1 084,6	- 63,8	106,1	2 119,3	2 161,6
	2050/2001							
Belgium	- 1,7	13,9	104,5	116,8	- 1,6	19,1	181,9	199,4
Finland	- 2,4	10,1	56,1	63,7	- 2,3	13,3	96,8	107,7
France	- 14,6	93,7	550,8	630,0	- 13,9	115,0	908,3	1 009,5
Germany	- 53,0	101,7	1 000,0	1 048,7	- 51,7	153,6	1 765,5	1 867,4
Total	- 71,7	219,4	1 711,5	1 859,2	- 69,6	301,1	2 952,6	3 184,0

1) France = 15-59 years.

Source: Calculations by DIW.



Table A.26 Age structure of persons receiving long-term care at home (%)

Countries	Baseline scenario			Living-longer-high scenario		
	Age-groups					
	0 - 59 <sup>1)</sup>	60 - 79	80+	0 - 59 <sup>1)</sup>	60 - 79	80+
	2001					
Belgium	9,1	39,0	51,8	9,1	39,0	51,9
Finland	16,6	37,1	46,3	16,6	37,0	46,4
France	19,3	33,0	47,7	19,3	33,0	47,7
Germany	20,3	35,5	44,2	20,3	35,5	44,2
Total	19,3	35,0	45,7	19,2	35,0	45,7
	2020					
Belgium	6,3	33,9	59,9	5,7	31,9	62,4
Finland	10,8	39,5	49,8	10,0	37,7	52,3
France	13,6	31,1	55,2	12,7	29,5	57,8
Germany	15,1	31,0	53,9	13,9	29,5	56,6
Total	14,0	31,5	54,5	12,9	29,9	57,1
	2050					
Belgium	4,0	25,8	70,2	3,0	20,8	76,2
Finland	7,5	27,5	65,0	5,7	22,7	71,5
France	8,6	24,0	67,4	6,7	19,8	73,5
Germany	9,2	24,2	66,7	6,9	19,6	73,5
Total	8,6	24,3	67,0	6,5	19,8	73,6
1) France = 15-59 years.						
Source: Calculations by DIW.						

*Table A.27 Changes in the age structure of long-term care recipients at home  
(percentage points)*

Countries	Baseline scenario			Living-longer-high scenario		
	Age-groups					
	0 - 59 <sup>1)</sup>	60 - 79	80+	0 - 59 <sup>1)</sup>	60 - 79	80+
	2020/2001					
Belgium	-2,9	-5,2	8,0	-3,4	-7,1	10,5
Finland	-5,8	2,4	3,4	-6,6	0,7	5,9
France	-5,7	-1,8	7,6	-6,7	-3,4	10,1
Germany	-5,2	-4,5	9,7	-6,4	-6,1	12,4
Total	-5,3	-3,5	8,8	-6,3	-5,1	11,4
	2050/2020					
Belgium	-2,3	-8,1	10,3	-2,8	-11,0	13,8
Finland	-3,3	-11,9	15,3	-4,3	-14,9	19,2
France	-5,0	-7,1	12,1	-6,0	-9,8	15,7
Germany	-5,9	-6,8	12,7	-7,1	-9,8	16,9
Total	-5,4	-7,2	12,5	-6,4	-10,1	16,5
	2050/2001					
Belgium	-5,2	-13,2	18,4	-6,1	-18,2	24,3
Finland	-9,2	-9,5	18,7	-10,9	-14,3	25,1
France	-10,7	-9,0	19,7	-12,6	-13,2	25,8
Germany	-11,1	-11,3	22,5	-13,4	-15,9	29,3
Total	-10,6	-10,7	21,3	-12,7	-15,2	27,9
1) France = 15-59 years.						
Source: Calculations by DIW.						

*Table A.28 Persons admitted into a hospital by health status in 2001 and 2050 in participating countries and the EU<sup>1)</sup> (per 1000 persons)*

Health status	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK	All	EU <sup>1)</sup>
Baseline scenario 2001										
good	472	210	210	1 359	2 473	430	930	2 008	8 093	9 839
fair	359	141	228	2 286	3 078	371	862	1 258	8 584	9 851
bad	188	98	86	1 364	3 491	169	890	1 236	7 522	8 821
total	1 018	450	525	5 008	9 042	970	2 682	4 503	24 198	28 511
2050										
Baseline scenario										
good	478	226	198	1 436	2 063	467	811	2 153	7 832	9 269
fair	453	179	272	2 924	3 298	498	1 063	1 565	10 251	11 754
bad	277	133	124	1 840	4 391	227	1 251	1 545	9 788	11 608
total	1 207	538	593	6 200	9 752	1 192	3 126	5 264	27 872	32 631
Baseline scenario with improving health										
good	500	236	207	1 568	2 300	487	867	2 292	8 457	9 808
fair	464	177	276	3 059	3 575	509	1 105	1 628	10 794	12 170
bad	140	91	84	797	3 066	93	903	821	5 994	8 352
total	1 104	504	566	5 424	8 940	1 089	2 876	4 741	25 244	30 329
Living-longer-high scenario										
good	511	241	207	1 513	2 136	496	868	2 318	8 290	9 797
fair	519	206	307	3 232	3 684	571	1 208	1 776	11 502	13 212
bad	340	160	149	2 051	5 152	258	1 453	1 755	11 318	13 402
total	1 369	607	663	6 797	10 972	1 326	3 529	5 848	31 110	36 410
Living-longer better health scenario										
good	536	253	218	1 657	2 389	518	930	2 474	8 975	10 388
fair	533	203	312	3 392	4 006	586	1 259	1 850	12 141	13 702
bad	179	113	105	918	3 694	110	1 067	945	7 131	9 857
total	1 248	569	635	5 967	10 090	1 213	3 256	5 270	28 247	33 947
1) EU (15) without Luxembourg and Sweden; people aged 15+.										
Source: Projections by DIW.										

*Table A.29 Persons admitted into a hospital by health status changes between 2001 and 2050 in participating countries and the EU<sup>1)</sup> (per 1000 persons)*

Health status	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK	All	EU <sup>1)</sup>
Baseline scenario										
good	6	16	- 13	77	- 410	37	- 119	145	- 261	- 570
fair	94	37	44	638	220	127	201	307	1 668	1 902
bad	89	36	38	476	900	58	361	309	2 266	2 788
total	189	89	69	1 191	710	222	443	761	3 673	4 120
Baseline scenario with improving health										
good	28	25	- 3	209	- 173	57	- 63	284	364	- 123
fair	105	36	47	774	496	138	243	370	2 210	2 430
bad	- 48	- 7	- 3	- 567	- 425	- 76	13	- 415	-1 528	- 180
total	85	54	42	416	- 102	119	193	239	1 046	2 128
Living-longer-high scenario										
good	39	31	- 3	154	- 338	65	- 63	309	195	- 45
fair	159	64	78	946	604	200	345	516	2 913	3 354
bad	152	62	63	686	1 659	89	562	518	3 791	4 574
total	350	157	138	1 786	1 925	355	845	1 343	6 899	7 884
Living-longer better health scenario										
good	64	42	8	298	- 84	87	0	465	880	455
fair	174	62	84	1 105	927	215	396	591	3 553	3 957
bad	- 9	15	18	- 447	201	- 60	176	- 292	- 397	1 319
total	229	119	110	956	1 043	242	572	764	4 036	5 731
1) EU (15) without Luxembourg and Sweden; people aged 15+.										
Source: Projections by DIW.										

*Table A.30 Persons admitted into a hospital by health status changes between 2001 and 2050 in participating countries and the EU 1) (%)*

Health status	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK	All	EU 1)
Baseline scenario										
good	1,3	7,5	-6,1	5,7	-16,6	8,6	-12,8	7,2	-3,2	-5,8
fair	26,1	26,2	19,2	27,9	7,1	34,1	23,3	24,4	19,4	19,3
bad	47,3	36,4	43,9	34,9	25,8	34,2	40,6	25,0	30,1	31,6
total	18,5	19,7	13,1	23,8	7,9	22,8	16,5	16,9	15,2	14,5
Baseline scenario with improving health										
good	6,0	12,1	-1,5	15,4	-7,0	13,2	-6,8	14,1	4,5	-1,2
fair	29,2	25,4	20,8	33,8	16,1	37,3	28,2	29,4	25,7	25,0
bad	-25,5	-7,2	-3,1	-41,6	-12,2	-45,0	1,5	-33,6	-20,3	-2,1
total	8,4	12,1	8,0	8,3	-1,1	12,3	7,2	5,3	4,3	7,5
Living-longer-high scenario										
good	8,2	14,7	-1,4	11,4	-13,7	15,2	-6,7	15,4	2,4	-0,5
fair	44,4	45,2	34,4	41,3	19,6	53,9	40,0	41,0	33,9	34,0
bad	80,7	63,3	72,9	50,3	47,5	52,7	63,1	41,9	50,4	51,8
total	34,3	34,9	26,4	35,6	21,3	36,6	31,5	29,8	28,5	27,6
Living-longer better health scenario										
good	13,6	20,1	3,6	21,9	-3,4	20,3	0,0	23,2	10,9	4,6
fair	48,4	43,5	36,7	48,3	30,1	57,9	46,0	46,9	41,4	40,6
bad	-4,5	15,2	21,3	-32,7	5,7	-35,3	19,7	-23,6	-5,3	15,4
total	22,5	26,4	20,9	19,1	11,5	25,0	21,3	17,0	16,7	20,3
1) EU (15) without Luxembourg and Sweden; people aged 15+.										
Source: Projections by DIW.										

*Table A.31 Hospital bed days by health status 2001 and 2050 in participating countries and the EU<sup>1)</sup> (per1000 persons)*

Health status	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK	All	EU <sup>1)</sup>
Baseline scenario 2001										
good	3 090	1 525	871	7 298	21 150	2 461	6 267	10 029	52 692	67 180
fair	4 968	1 565	2 086	21 836	42 193	3 914	9 014	10 634	96 209	110 715
bad	4 102	2 243	1 742	27 460	77 778	3 227	17 146	16 490	150 188	172 152
total	12 159	5 333	4 699	56 594	141 121	9 602	32 427	37 153	299 090	350 047
2050										
Baseline scenario										
good	3 726	1 814	889	8 352	18 568	2 932	6 430	12 627	55 338	69 920
fair	6 718	2 100	2 717	30 755	47 866	5 569	11 659	15 334	122 717	141 810
bad	5 382	3 025	2 590	38 420	102 631	4 459	24 737	23 369	204 613	231 772
total	15 826	6 938	6 195	77 526	169 065	12 961	42 826	51 330	382 668	443 503
Baseline scenario with improving health										
good	3 956	1 922	939	9 231	20 918	3 074	6 990	13 641	60 670	74 615
fair	6 905	2 074	2 761	32 501	52 273	5 719	12 159	16 042	130 435	147 328
bad	2 527	2 081	1 764	17 538	73 687	1 874	17 921	12 803	130 195	168 931
total	13 388	6 076	5 465	59 270	146 879	10 666	37 070	42 486	321 301	390 874
Living-longer-high scenario										
good	4 270	2 035	965	8 998	19 549	3 211	7 140	14 535	60 703	76 291
fair	7 880	2 488	3 161	34 935	54 308	6 542	13 341	18 394	141 049	162 834
bad	6 350	3 570	3 145	43 191	121 955	5 086	28 887	27 896	240 080	269 145
total	18 501	8 092	7 272	87 124	195 813	14 839	49 367	60 825	441 833	508 270
Living-longer better health scenario										
good	4 550	2 171	1 022	9 978	22 133	3 373	7 788	15 757	66 771	81 632
fair	8 122	2 445	3 226	37 010	59 486	6 728	13 946	19 268	150 232	169 431
bad	3 125	2 528	2 234	20 299	89 682	2 200	21 284	15 541	156 894	200 337
total	15 796	7 144	6 482	67 287	171 301	12 302	43 018	50 566	373 896	451 401
1) EU (15) without Luxembourg and Sweden; people aged 15+.										
Source: Projections by DIW.										

*Table A.32 Hospital bed days by health status – Changes between 2001 and 2050 in participating countries and the EU<sup>1)</sup> (per 1000 persons)*

Health status	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK	All	EU <sup>1)</sup>
Baseline scenario										
good	636	288	18	1 053	-2 582	471	163	2 598	2 646	2 740
fair	1 750	534	631	8 919	5 673	1 655	2 645	4 700	26 508	31 095
bad	1 280	782	848	10 960	24 853	1 232	7 590	6 879	54 424	59 621
total	3 667	1 605	1 496	20 932	27 944	3 358	10 399	14 177	83 579	93 456
Baseline scenario with improving health										
good	865	396	69	1 932	- 232	612	722	3 613	7 978	6 907
fair	1 938	509	675	10 665	10 080	1 805	3 146	5 408	34 226	37 657
bad	-1 574	- 162	22	-9 922	-4 090	-1 353	774	-3 687	-19 993	1 820
total	1 229	743	766	2 676	5 758	1 064	4 643	5 333	22 211	46 384
Living-longer-high scenario										
good	1 178	509	94	1 697	-1 605	749	870	4 499	7 990	9 084
fair	2 908	921	1 073	13 084	12 090	2 625	4 321	7 749	44 771	52 040
bad	2 245	1 324	1 401	15 713	44 110	1 857	11 726	11 389	89 765	96 854
total	6 331	2 754	2 569	30 494	54 594	5 230	16 917	23 638	142 527	157 978
Living-longer better health scenario										
good	1 457	645	151	2 677	978	911	1 518	5 721	14 058	13 898
fair	3 150	878	1 138	15 159	17 268	2 811	4 926	8 623	53 954	59 681
bad	- 981	283	490	-7 179	11 837	-1 029	4 123	- 966	6 579	33 086
total	3 627	1 806	1 779	10 657	30 083	2 693	10 567	13 378	74 591	106 666
1) EU (15) without Luxembourg and Sweden; people aged 15+.										
Source: Projections by DIW.										

*Table A.33 Hospital bed days by health status – Changes between 2001 and 2050 in participating countries and the EU<sup>1)</sup> (%)*

Health status	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK	All	EU <sup>1)</sup>
Baseline scenario										
good	21	19	2	14	-12	19	3	26	5	4
fair	35	34	30	41	13	42	29	44	28	28
bad	31	35	49	40	32	38	44	42	36	35
total	30	30	32	37	20	35	32	38	28	27
Baseline scenario with improving health										
good	28	26	8	26	-1	25	12	36	15	10
fair	39	33	32	49	24	46	35	51	36	34
bad	-38	-7	1	-36	-5	-42	5	-22	-13	1
total	10	14	16	5	4	11	14	14	7	13
Living-longer-high scenario										
good	38	33	11	23	-8	30	14	45	15	14
fair	58	59	51	60	29	67	48	73	47	47
bad	55	59	80	57	57	57	68	69	60	56
total	52	52	55	54	39	54	52	64	48	45
Living-longer better health scenario										
good	47	42	17	37	5	37	24	57	27	21
fair	63	56	55	69	41	72	55	81	56	54
bad	-24	13	28	-26	15	-32	24	-6	4	20
total	30	34	38	19	21	28	33	36	25	31
1) EU (15) without Luxembourg and Sweden; people aged 15+.										
Source: Projections by DIW.										



*Table A.34 Contacts with a general practitioner by health status 2001 and 2050 in participating countries and the EU<sup>1)</sup> (million)*

Health status	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK	All	EU <sup>1)</sup>
Baseline scenario 2001										
good	20,8	6,6	4,5	59,1	66,8	17,8	48,3	74,2	298,0	410,2
fair	14,4	3,7	3,4	77,7	113,1	13,9	40,8	40,5	307,5	378,1
bad	6,2	2,3	1,8	33,3	113,8	5,3	34,1	27,2	223,8	286,1
total	41,3	12,6	9,6	170,1	293,7	37,0	123,1	141,9	829,4	1 074,4
2050										
Baseline scenario										
good	21,6	7,0	3,9	61,7	57,6	19,5	42,4	79,7	293,3	392,1
fair	18,1	4,6	3,8	99,6	119,3	17,9	50,1	47,9	361,2	449,1
bad	7,9	3,0	3,1	45,9	135,9	6,9	46,9	32,2	281,7	381,1
total	47,6	14,5	10,7	207,1	312,8	44,2	139,4	159,8	936,3	1 222,4
Baseline scenario with improving health										
good	22,7	7,3	4,0	67,2	64,9	20,3	45,4	84,7	316,6	415,4
fair	18,6	4,5	3,8	104,3	129,4	18,2	52,2	49,7	380,7	465,5
bad	3,6	2,0	2,4	19,8	93,7	2,9	33,8	17,1	175,2	277,5
total	44,9	13,8	10,2	191,3	288,0	41,4	131,4	151,6	872,5	1 158,4
Living-longer-high scenario										
good	23,3	7,4	4,0	64,6	60,1	20,6	45,2	84,8	310,0	415,0
fair	20,6	5,2	4,2	110,0	132,0	20,3	56,4	52,7	401,3	502,0
bad	9,1	3,5	4,0	51,3	156,3	7,8	54,1	35,7	321,8	440,2
total	53,0	16,1	12,1	225,9	348,3	48,7	155,7	173,2	1 033,1	1 357,3
Living-longer better health scenario										
good	24,5	7,7	4,1	70,6	68,0	21,5	48,6	90,5	335,5	440,5
fair	21,3	5,1	4,2	115,4	143,5	20,7	58,9	54,8	424,0	521,1
bad	4,3	2,4	3,2	22,9	110,4	3,4	39,6	19,1	205,3	327,1
total	50,1	15,2	11,5	209,0	321,9	45,6	147,1	164,4	964,8	1 288,7
1) EU (15) without Luxembourg and Sweden; people aged 15+.										
Source: Projections by DIW.										

*Table A.35 Contacts with a general practitioner by health status – Changes between 2001 and 2050 in participating countries and the EU<sup>1)</sup> (per 1000 persons)*

Health status	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK	All	EU <sup>1)</sup>
Baseline scenario										
good	832	365	- 592	2 572	-9 186	1 664	-5 874	5 482	-4 736	-18 103
fair	3 741	841	354	21 839	6 235	4 003	9 299	7 415	53 727	71 040
bad	1 747	686	1 334	12 551	22 092	1 594	12 839	5 048	57 890	95 038
total	6 320	1 893	1 097	36 961	19 141	7 261	16 264	17 944	106 881	147 975
Baseline scenario with improving health										
good	1 902	642	- 436	8 135	-1 861	2 470	-2 876	10 561	18 536	1 797
fair	4 242	813	352	26 528	16 290	4 345	11 395	9 249	73 215	90 988
bad	-2 579	- 330	648	-13 503	-20 076	-2 395	- 269	-10 106	-48 610	-1 294
total	3 566	1 124	564	21 159	-5 647	4 420	8 250	9 704	43 141	91 491
Living-longer-high scenario										
good	2 492	749	- 519	5 516	-6 713	2 782	-3 066	10 650	11 891	4 676
fair	6 249	1 468	737	32 189	18 820	6 402	15 597	12 175	93 637	123 742
bad	2 959	1 195	2 271	17 976	42 407	2 519	19 990	8 465	97 781	153 915
total	11 699	3 413	2 489	55 681	54 514	11 703	32 521	31 290	203 309	282 333
Living-longer better health scenario										
good	3 709	1 070	- 358	11 527	1 193	3 670	274	16 280	37 365	26 851
fair	6 868	1 415	753	37 687	30 377	6 836	18 085	14 266	116 287	146 391
bad	-1 854	89	1 466	-10 397	-3 460	-1 906	5 504	-8 109	-18 666	48 031
total	8 723	2 574	1 861	38 817	28 110	8 600	23 864	22 437	134 986	221 274

1) EU (15) without Luxembourg and Sweden; people aged 15+.  
Source: Projections by DIW.

*Table A.36 Contacts with a general practitioner by health status – Changes between 2001 and 2050 in participating countries and the EU<sup>1)</sup> (%)*

Health status	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK	All	EU <sup>1)</sup>
Baseline scenario										
good	4,0	5,5	-13,2	4,4	-13,8	9,3	-12,2	7,4	-1,6	-4,4
fair	26,0	22,6	10,3	28,1	5,5	28,9	22,8	18,3	17,5	18,8
bad	28,4	30,1	75,9	37,7	19,4	30,2	37,7	18,6	25,9	33,2
total	15,3	15,0	11,4	21,7	6,5	19,6	13,2	12,6	12,9	13,8
Baseline scenario with improving health										
good	9,2	9,7	-9,8	13,8	-2,8	13,8	-6,0	14,2	6,2	0,4
fair	29,5	21,8	10,3	34,1	14,4	31,3	27,9	22,8	23,8	24,3
bad	-41,9	-14,5	36,9	-40,5	-17,6	-45,3	-0,8	-37,2	-21,7	-0,5
total	8,6	8,9	5,8	12,4	-1,9	11,9	6,7	6,8	5,2	8,6
Living-longer-high scenario										
good	12,0	11,3	-11,6	9,3	-10,0	15,6	-6,3	14,4	4,0	1,1
fair	43,4	39,4	21,5	41,4	16,6	46,1	38,2	30,1	30,4	32,7
bad	48,0	52,4	129,0	53,9	37,2	47,7	58,6	31,1	43,7	53,8
total	28,3	27,0	25,8	32,7	18,6	31,6	26,4	22,0	24,5	26,3
Living-longer better health scenario										
good	17,8	16,1	-8,0	19,5	1,8	20,6	0,6	21,9	12,5	6,5
fair	47,7	38,0	22,0	48,5	26,8	49,3	44,3	35,2	37,8	39,1
bad	-30,1	3,9	83,3	-31,2	-3,0	-36,1	16,1	-29,8	-8,3	17,2
total	21,1	20,4	19,3	22,8	9,6	23,2	19,4	15,8	16,3	20,7
1) EU (15) without Luxembourg and Sweden; people aged 15+.										
Source: Projections by DIW.										

*Table A.37 Persons severely hampered by chronic illness or disability by health status in 2001 and 2050 in participating countries and the EU<sup>1)</sup> (per 1000 persons)*

Health status	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK <sup>2)</sup>	All	EU <sup>1)</sup>
Baseline scenario 2001										
good	47	26	16	315	128	108	106	1 103	1 849	2 096
fair	172	89	138	2 109	902	453	399	1 801	6 064	7 472
bad	207	166	171	2 557	5 679	461	1 343	1 914	12 500	16 165
total	426	281	326	4 982	6 709	1 023	1 849	4 819	20 413	25 733
cut down <sup>3)</sup>	211	184	254	1 684	-	615	948	3 227	7 122	14 536
2050										
Baseline scenario										
good	61	33	18	363	167	133	104	1 516	2 397	2 577
fair	241	119	182	3 077	1 174	609	508	2 537	8 447	9 689
bad	267	231	258	3 622	7 632	602	1 963	2 530	17 105	22 028
total	569	384	458	7 063	8 974	1 344	2 576	6 583	27 949	34 294
cut down <sup>3)</sup>	278	248	358	2 447	5 156	779	1 365	4 680	15 311	19 591
Baseline scenario with improving health										
good	65	36	20	401	199	140	112	1 647	2 620	2 779
fair	249	118	187	3 266	1 292	622	531	2 653	8 918	10 074
bad	123	160	182	1 611	5 592	254	1 441	1 377	10 740	16 206
total	437	314	389	5 278	7 082	1 017	2 084	5 677	22 278	29 060
cut down <sup>3)</sup>	213	203	305	1 839	4 092	584	1 112	4 059	12 406	16 680
Living-longer-high scenario										
good	72	39	20	394	203	149	115	1 783	2 775	2 968
fair	286	142	211	3 515	1 385	708	589	2 977	9 813	11 182
bad	309	277	317	4 085	9 112	687	2 333	2 927	20 048	25 760
total	667	458	548	7 994	10 700	1 544	3 037	7 687	32 637	39 910
cut down <sup>3)</sup>	325	296	429	2 779	6 162	880	1 616	5 575	18 061	22 860
Living-longer better health scenario										
good	77	43	22	437	243	157	124	1 943	3 045	3 209
fair	296	140	218	3 738	1 528	726	616	3 117	10 378	11 644
bad	148	198	232	1 878	6 818	300	1 744	1 615	12 934	19 352
total	522	380	472	6 053	8 589	1 183	2 484	6 675	26 358	34 205
cut down <sup>3)</sup>	253	245	370	2 116	4 969	666	1 330	4 869	14 818	19 675

1) EU (15) without Luxembourg and Sweden; people aged 15+.- 2) Severely and to some extent hampered.- 3) Severely hampered persons who have to cut down things they usually do due to chronic illness or disability (all health status together).  
Source: Projections by DIW.

*Table A.38 Persons severely hampered by chronic illness or disability by health status in participating countries and the EU<sup>1)</sup> – Changes between 2001 and 2050 (per 1000 persons)*

Health status	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK <sup>2)</sup>	All	EU <sup>1)</sup>
Baseline scenario										
good	14	8	3	48	39	25	- 2	413	548	481
fair	69	30	43	968	272	156	109	736	2 383	2 217
bad	60	65	86	1 065	1 953	140	620	616	4 605	5 863
total	143	103	132	2 081	2 264	321	727	1 764	7 536	8 561
cut down <sup>3)</sup>	67	64	105	762	1 335	164	417	1 453	4 367	5 055
Baseline scenario with improving health										
good	19	10	4	86	71	32	6	544	771	672
fair	77	29	49	1 157	389	169	131	852	2 854	2 649
bad	- 85	- 6	11	- 947	- 87	- 207	98	- 538	-1 760	456
total	11	33	64	296	373	- 5	236	858	1 865	3 778
cut down <sup>3)</sup>	2	19	51	155	270	- 31	164	832	1 462	2 362
Living-longer-high scenario										
good	26	13	5	79	75	41	9	679	925	870
fair	114	53	72	1 404	482	255	189	1 174	3 743	3 705
bad	101	111	145	1 526	3 428	226	989	1 011	7 538	9 582
total	241	177	222	3 010	3 985	521	1 187	2 864	12 207	14 157
cut down <sup>3)</sup>	114	112	175	1 093	2 337	265	668	2 344	7 108	8 312
Living-longer better health scenario										
good	31	17	6	122	115	49	18	839	1 196	1 101
fair	124	51	79	1 627	625	272	217	1 314	4 309	4 213
bad	- 60	32	61	- 681	1 134	- 161	400	- 301	424	3 589
total	95	99	146	1 068	1 874	160	634	1 852	5 928	8 903
cut down <sup>3)</sup>	42	61	116	430	1 144	51	382	1 638	3 865	5 346

1) EU (15) without Luxembourg and Sweden; people aged 15+.- 2) Severely and to some extent hampered.- 3) Severely hampered persons who have to cut down things they usually do due to chronic illness or disability (all health status together).  
Source: Projections by DIW.

*Table A.39 Persons severely hampered by chronic illness or persons by health status in participating countries and the EU<sup>1)</sup> – Changes between 2001 and 2050 (%)*

Health status	Belgium	Denmark	Finland	France	Germany	Netherlands	Spain	UK <sup>2)</sup>	All	EU <sup>1)</sup>
Baseline scenario										
good	31,0	29,0	16,1	15,4	30,8	23,2	-1,8	37,4	29,7	22,9
fair	39,9	34,2	31,3	45,9	30,1	34,4	27,3	40,8	39,3	29,7
bad	28,7	39,1	50,4	41,6	34,4	30,4	46,1	32,2	36,8	36,3
total	33,5	36,6	40,6	41,8	33,7	31,4	39,3	36,6	36,9	33,3
cut down <sup>3)</sup>	31,7	35,0	41,2	45,3	34,9	26,7	44,0	45,0	39,9	34,8
Baseline scenario with improving health										
good	39,9	38,9	24,2	27,4	55,4	29,5	5,7	49,3	41,7	31,9
fair	44,7	32,9	35,4	54,8	43,1	37,4	32,9	47,3	47,1	35,7
bad	-40,8	-3,7	6,2	-37,0	-1,5	-44,8	7,3	-28,1	-14,1	2,9
total	2,5	11,8	19,5	5,9	5,6	-0,5	12,7	17,8	9,1	14,9
cut down <sup>3)</sup>	0,8	10,4	20,1	9,2	7,1	-5,1	17,3	25,8	13,4	16,5
Living-longer-high scenario										
good	54,7	51,5	29,4	25,1	58,2	37,6	8,0	61,5	50,0	41,5
fair	66,0	59,2	52,0	66,5	53,4	56,2	47,4	65,1	61,7	49,5
bad	48,9	66,8	84,6	59,6	60,3	48,9	73,6	52,8	60,3	59,2
total	56,4	63,0	68,1	60,4	59,3	50,9	64,1	59,4	59,7	55,0
cut down <sup>3)</sup>	53,8	60,6	69,1	64,9	61,1	43,0	70,4	72,6	64,9	57,1
Living-longer better health scenario										
good	65,8	64,5	38,7	38,6	89,5	45,0	16,8	76,0	64,6	52,3
fair	72,0	56,8	57,1	77,1	69,2	60,1	54,2	72,9	71,0	56,7
bad	-28,7	19,2	35,4	-26,6	20,0	-35,0	29,7	-15,7	3,4	22,8
total	22,3	35,3	44,8	21,4	27,9	15,6	34,3	38,4	29,0	35,2
cut down <sup>3)</sup>	19,8	33,1	45,8	25,5	29,9	8,3	40,2	50,7	35,3	37,3

1) EU (15) without Luxembourg and Sweden; people aged 15+.- 2) Severely and to some extent hampered.- 3) Severely hampered persons who have to cut down things they usually do due to chronic illness or disability (all health status together).  
Source: Projections by DIW.

*Table A.40 Development of the population aged 15+, health care utilisation and severely hampered persons in 2050 – Difference between the living-longer high scenario and the baseline scenario (2001 = 100)*

Countries	Living-longer-high scenario - Baseline scenario				
	Population 15+	Hospital admissions	Hospital days	Contacts with a GP <sup>1)</sup>	Hampered persons <sup>2)</sup>
	constant health				
Belgium	7	16	22	13	22
Denmark	7	15	22	12	26
Finland	6	13	23	14	28
France	6	12	17	11	20
Germany	7	13	19	12	26
Netherlands	7	14	19	12	16
Spain	7	15	20	13	26
United Kingdom	7	13	25	9	28
All	7	13	20	12	25
EU (15) <sup>3)</sup>	7	13	18	12	22
	improving health				
Belgium	7	14	20	12	19
Denmark	7	14	20	11	23
Finland	6	13	22	13	26
France	6	11	14	10	17
Germany	7	13	17	11	23
Netherlands	7	13	17	11	13
Spain	7	14	18	13	23
United Kingdom	7	12	22	9	25
All	7	12	17	11	22
EU (15) <sup>**)</sup>	7	13	17	12	21
<p>1) GP= General Practitioner.- 2) Severely hampered persons who have to cut down things they usually do due to chronic illness or disability (all health status together).- 3) Without Luxembourg and Sweden. Source: Projections by DIW.</p>					

*Table A.41 Development of the population aged 15+, health care utilisation and severely hampered persons 2050 – Difference between improving health and constant health (2001 = 100)*

Countries	Baseline scenario					Living longer-high scenario				
	Population 15+	Hospital admissions	Hospital days	Contacts with a GP <sup>1)</sup>	Hampered persons <sup>2)</sup>	Population 15+	Hospital admissions	Hospital days	Contacts with a GP <sup>1)</sup>	Hampered persons <sup>2)</sup>
	constant health - improving health									
Belgium	0	10	20	7	31	0	12	22	7	34
Denmark	0	8	16	6	25	0	8	18	7	28
Finland	0	5	16	6	21	0	5	17	6	23
France	0	15	32	9	36	0	17	35	10	39
Germany	0	9	16	8	28	0	10	17	9	31
Netherlands	0	11	24	8	32	0	12	26	8	35
Spain	0	9	18	7	27	0	10	20	7	30
United Kingdom	0	12	24	6	19	0	13	28	6	22
All	0	11	21	8	27	0	12	23	8	30
EU(15) <sup>3)</sup>	0	7	13	5	19	0	7	14	6	20

1) GP=General Practitioner.- 2) Severely hampered persons who have to cut down things they usually do due to chronic illness or disability (all health status together).- 3) Without Luxembourg and Sweden.  
Source: Projections by DIW.



*Table A.42 Development of the population aged 15+, health care utilisation and severely hampered persons 2050 – Difference with regard to the baseline scenario (2001 = 100)*

Countries	Baseline scenario					Living-longer-high scenario				
	Population 15+	Hospital admissions	Hospital days	Contacts with a GP <sup>1)</sup>	Hampered persons <sup>2)</sup>	Population 15+	Hospital admissions	Hospital days	Contacts with a GP <sup>1)</sup>	Hampered persons <sup>2)</sup>
	constant health									
Belgium	0	0	0	0	0	7	16	22	13	22
Denmark	0	0	0	0	0	7	15	22	12	26
Finland	0	0	0	0	0	6	13	23	14	28
France	0	0	0	0	0	6	12	17	11	20
Germany	0	0	0	0	0	7	13	19	12	26
Netherlands	0	0	0	0	0	7	14	19	12	16
Spain	0	0	0	0	0	7	15	20	13	26
United Kingdom	0	0	0	0	0	7	13	25	9	28
All	0	0	0	0	0	7	13	20	12	25
EU (15) <sup>3)</sup>	0	0	0	0	0	7	13	18	12	22
	improving health									
Belgium	0	- 10	- 20	- 7	- 31	7	4	0	6	- 12
Denmark	0	- 8	- 16	- 6	- 25	7	7	4	5	- 2
Finland	0	- 5	- 16	- 6	- 21	6	8	6	8	5
France	0	- 15	- 32	- 9	- 36	6	- 5	- 18	1	- 19
Germany	0	- 9	- 16	- 8	- 28	7	4	2	3	- 5
Netherlands	0	- 11	- 24	- 8	- 32	7	2	- 7	4	- 19
Spain	0	- 9	- 18	- 7	- 27	7	5	0	6	- 4
United Kingdom	0	- 12	- 24	- 6	- 19	7	0	- 2	3	6
All	0	- 11	- 21	- 8	- 27	7	1	- 3	3	- 5
EU (15) <sup>3)</sup>	0	- 7	- 13	- 5	- 19	7	6	4	7	2

1) GP= General Practitioner.- 2) Severely hampered persons who have to cut down things they usually do due to chronic illness or disability (all health status together).- 3) Without Luxembourg and Sweden.  
Source: Projections by DIW.

## AGIR – Ageing, Health and Retirement in Europe

**AGIR** is the title of a major study on the process of population ageing in Europe and its future economic consequences. This project was motivated by an interest in verifying whether people are not only living longer but also in better health. It aims at analysing how the economic impact of population ageing could vary when not only demographic factors, but also health developments are taken into consideration. The project started in January 2002 for a period of three years.

The **principal objectives** of the study are to:

- document developments in the health of the elderly, ideally since 1950, based on a systematic collection of existing national data on the health and morbidity of different cohorts of the population;
- analyse retirement decisions and the demand for health care as a function of age, health and the utility of work and leisure;
- combine these results, and on that basis to elaborate scenarios for the future evolution of expenditure on health care and pensions; and
- analyse the potential macroeconomic consequences of different measures aiming at improving the sustainability of the European pension systems.

The **AGIR** project is carried out by a consortium of **nine European research institutes**, most of which are members of ENEPRI:

- **CEPS** (Centre for European Policy Studies), Brussels
- **CEPII** (Centre d'Etudes Prospectives et d'Informations Internationales), Paris
- **CPB** (Netherlands Bureau for Economic Policy Analysis), The Hague
- **DIW** (Deutsches Institut für Wirtschaftsforschung), Berlin
- **ETLA** (the Research Institute of the Finnish Economy), Helsinki
- **FEDEA** (Fundación de Estudios de Economía Aplicada), Madrid
- **FPB** (Belgian Federal Planning Bureau), Brussels
- **NIESR** (National Institute for Economic and Social Research), London
- **LEGOS** (Laboratoire d'Economie et de Gestion des Organisations de Santé, Université de Paris-Dauphine), Paris

It has received finance from the European Commission, under the Quality of Life Programme of the 5<sup>th</sup> EU Research Framework Programme. The project is coordinated by **Jorgen Mortensen**, Associate Senior Research Fellow at CEPS. For further information, contact him at: [jorgen.mortensen@ceps.be](mailto:jorgen.mortensen@ceps.be).

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The European Network of Economic Policy Research Institutes (**ENEPRI**) is composed of leading socio-economic research institutes in practically all EU member states and candidate countries that are committed to working together to develop and consolidate a European agenda of research. **ENEPRI** was launched in 2000 by the Brussels-based Centre for European Policy Studies (CEPS), which provides overall coordination for the initiative.

While the European construction has made gigantic steps forward in the recent past, the European dimension of research seems to have been overlooked. The provision of economic analysis at the European level, however, is a fundamental prerequisite to the successful understanding of the achievements and challenges that lie ahead. **ENEPRI** aims to fill this gap by pooling the research efforts of its different member institutes in their respective areas of specialisation and to encourage an explicit European-wide approach.

**ENEPRI** is composed of the following member institutes:

CASE	Center for Social and Economic Research, Warsaw, Poland
CEPII	Centre d'Études Prospectives et d'Informations Internationales, Paris, France
CEPS	Centre for European Policy Studies, Brussels, Belgium
CERGE-EI	Centre for Economic Research and Graduated Education, Charles University, Prague, Czech Republic
CPB	Netherlands Bureau for Economic Policy Analysis, The Hague, The Netherlands
DIW	Deutsches Institut für Wirtschaftsforschung, Berlin, Germany
ESRI	Economic and Social Research Institute, Dublin, Ireland
ETLA	Research Institute for the Finnish Economy, Helsinki, Finland
FEDEA	Fundación de Estudios de Economía Aplicada, Madrid, Spain
FPB	Federal Planning Bureau, Brussels, Belgium
IE-BAS	Institute of Economics, Bulgarian Academy of Sciences, Sofia, Bulgaria
IER	Institute for Economic Research, Ljubljana, Slovenia
IHS	Institute for Advanced Studies, Vienna, Austria
ISAE	Istituto di Studi e Analisi Economica, Rome, Italy
ISWE-SAS	Institute for Slovak and World Economy, Bratislava, Slovakia
NIER	National Institute of Economic Research, Stockholm, Sweden
NIESR	National Institute of Economic and Social Research, London, UK
NOBE	Niezalezny Osrodek Bana Ekonomicznych, Lodz, Poland
PRAXIS	Center for Policy Studies, Tallinn, Estonia
RCEP	Romanian Centre for Economic Policies, Bucharest, Romania
TÁRKI	Social Research Centre Inc., Budapest, Hungary

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