



Federal Health Reporting

# Health in Germany



**ROBERT KOCH INSTITUTE**  
Federal Statistical Office



Federal Health Reporting

# Health in Germany

June 2008, Berlin



## Introduction

The first health report for Germany was published in 1998, marking the beginning of Federal Health Reporting (GBE). The Robert Koch Institute and the Federal Statistical Office are jointly in charge of processing the data.

During the past few years Federal Health Reporting has developed into an indispensable source of information both on the state of health of the people living in Germany and on our healthcare system. Numerous booklets and detailed reports have been published since then covering the entire spectrum of our healthcare system. The subjects covered include the overall conditions affecting our healthcare system, the health of the population, health behaviour, the threats to health caused by major diseases, and questions concerning the cost and performance of the system.

The great interest that has been aroused by the booklets and reports published to date, not just among professionals but also among many members of the general public, demonstrates the importance of this form of monitoring and reporting. Those involved in the policy-making process also benefit from a comprehensive health reporting system. The Federal Health Reporting provides processed data which are important in decision-making on health-policy issues.

Now, eight years later, the success of Federal Health Reporting (the Information System for Health Monitoring), and not least the demand for an up-to-date health report for Germany, has led the German Ministry of Health to present a new health report in a compact form within the framework of Federal Health Reporting.

The report "Health in Germany" is based on the latest available data. It focuses on the specific topics dealt with in detail in booklets and detailed reports and highlights the following aspects: health situation, health factors, health promotion, healthcare, health costs and patient orientation.

I would like to thank everyone who participated in the creation of "Health in Germany", especially the members of the Federal Health Reporting Commission as well as the staff of the Robert Koch Institute and the Federal Statistical Office. I am certain that "Health in Germany" will be at least as successful as its predecessor was.



Ulla Schmidt

Minister of Health  
Member of the German Parliament

**How to read this report:**

**Key statements**

- ▶ Key statements for each chapter can be found on the left at the beginning of the chapter.

▶ **Abstract**

There is an abstract of the contents at the beginning of each capital and subcapital.

**Brief and concise: at the beginning of many paragraphs there is a compact statement as to the contents.** The main text follows this principle.\*

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**Definition**

At the foot of the text column specialist topics or contents are clarified in the category “Definition”; see also the Glossary on page\*\*.

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**Excursus**

An excursus deals with follow-up topics such as methodological questions, explanations of the

data selection, general questions about the data basis, and so forth. It can be found at the bottom margin of the page.

## Preface

The process of health reporting is never complete. When in 1999 – shortly after the publication of the first “Health Report for Germany” – the responsibility for health monitoring was handed over from the Federal Statistical Office to the Robert Koch Institute, this ensured primarily the maintenance of approved and tested methods of reporting (processing and presenting data) and the continuation of the close cooperation between representatives of public health sciences and those responsible for official statistics, i.e. the Robert Koch Institute and the Federal Statistical Office. Furthermore, the need had arisen to develop the concept further, to adapt to the needs and requirements of the user, and to ensure the continuation of Federal Health Reporting (GBE).

The GBE topic booklets, published since 2000, are a major contribution to continuity and user orientation (they can be accessed at [www.rki.de](http://www.rki.de)). The topics were selected in cooperation with the Federal Health Reporting Commission following defined aspects that called for tender, partly elaborated by external authors, reviewed, revised and edited by the Robert Koch Institute, and then finally printed. 30 GBE topic booklets have been published in this manner to date (for example on unemployment and health, chronic pain, dementia or self-help in the field of health), each issue with a minimum print run of 15,000. The demand from the general public, educational and research bodies and decision-makers (stakeholders) in health policy grows with every issue.

An equally important product of the Federal Health Reporting is the information system of the Information and Documentation Centre for Health Data at the Federal Statistical Office, which is accessible via the Internet ([www.gbe-bund.de](http://www.gbe-bund.de)). By the end of 2005 the information system provided data and information from more than 115 data sources on health and the health-care system. It makes the results available in the form of individually arrangeable tables and clearly arranged graphics and refers to any relevant information that is already provided by other products from Federal Health Reporting.

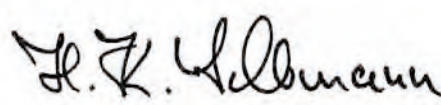
This online database can now boast of a large and continually growing usage. That it could be put to even better use, however, is revealed by the fact that data about health in Germany still tend to be quoted from foreign sources rather than from the data produced by the Federal Health Reporting.

Like its predecessor eight years ago, the report presented here, “Health in Germany”, provides a comprehensive overview of the state of health of the German population and the health service in Germany. To this end chapters from the first health report have been updated, contents of the GBE topic booklets integrated, previously missing information supplied and new topics addressed. The report focuses on key issues and portrays trends in the development of health and the health system over the last ten years. It is in the nature of limited resources that it was not possible this time to deal comprehensively with all the subjects in the Federal Health Reporting – apart from which we did not want to make the complete report too heavy to carry! Although the Federal Health Reporting Commission and the Department for Epidemiology and Health Reporting of the Robert Koch Institute selected the subjects on the basis of fixed criteria, there was inevitably a certain element of subjectivity in the choice of subject matter. The new report on health differs from the first not only in appearance. The Robert Koch Institute, the Federal Statistical Office and the Federal Health Reporting Commission have taken pains to present the information in an accessible and not too scientific language, but without making compromises in terms of precision or clarity. Anyone who has needed to combine simplicity and accuracy will know how difficult it can be to strike the right balance. If such a balance has been successfully struck in this case, then credit is due among others to the science journalist Dr. Martin Linder for all his support.

Everyone involved identified themselves with the project to an admirable extent, especially the employees of the Robert Koch Institute and the Information and Documentation Centre at the Federal Statistical Office, as well as the members of the Federal Health Reporting Commission. They all hope not only to have met the high expectations of the readership of the German Federal Health Reporting’s publications, but also to have widened the circle of those who are interested in the work. A health report is not created for its own sake, but with the aim of providing members of the public, as well as those actively involved in the health service and health policy-making, with information that supports and accompanies them in all their efforts connected with health and healthcare. We shall learn in the next “Health in Germany” whether this aim has been accomplished



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## Contributors

For the report “Health in Germany”, chapters from the first health report have been updated, material from GBE topic booklets integrated, previously missing information supplied and new topics introduced. Expertise from the widest possible sources has been called on to make this happen.

Essentially, the report was conceived in a cooperative dialogue, revised, edited and proofread

- ▶ by members of the **Health Reporting Commission**
- ▶ by members of the **Department of Epidemiology and Health Reporting of the Robert Koch Institute**
- ▶ by the employees of the **health section of the Federal Statistical Office**.

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**Key statements**

- ▶ Life expectancy in Germany is 81.6 years for women and 76 years for men. (Page 15)
- ▶ One in five Germans considers his/her health to be very good, while only one in hundred considers it to be very bad. (Page 17)
- ▶ Within one year, 15 percent of woman and eight percent of men experience a bout of depression. (Page 29)
- ▶ 11,000 Germans commit suicide each year; over 70 percent of them are men. (Page 30)
- ▶ Today there are about one million people with dementia. According to current estimates this figure could double by 2050. (Page 33)
- ▶ One in five women and one in seven men suffers from chronic back pain. (Page 34)
- ▶ While the incidence of lung cancer in men is falling, it is increasing among women owing to an increase in cigarette consumption. (Page 42)
- ▶ The teeth of 12-year-old schoolchildren are healthier than before. On average 1.2 teeth are affected by caries. (With an average of 1.2 teeth infected with caries, 12-year-old children have never had such healthy teeth as they do today.) (Page 49)
- ▶ A total of 49,000 HIV infected people live in Germany. (Page 53)
- ▶ The number of employees off work sick has decreased significantly since the mid-1990s, and there is less and less difference between the eastern and western Germany in this respect. (Page 57)
- ▶ Two million Germans are in need of care. The majority of those being cared for are looked after at home by a female member of the family. (Page 65)
- ▶ About 70 percent of all mortalities are caused by cardiovascular diseases and forms of cancer. (Page 69)
- ▶ At about four deaths per 1000 newborns, the infant mortality rate in Germany is one of the lowest in the EU. (Page 73)

## 1 What is our health situation?

### ► *Abstract*

Generally speaking, the health of the German population has improved over the last ten years. Life expectancy has continued to rise, while the mortality rate has been falling. Hence, a trend that has been discernible since the 1970s continues. The difference between western and eastern Germany is smaller than it was in 1990, and the life expectancy of people living in eastern Germany is catching up fast. Women, in particular, enjoy almost the same life expectancy in the east as in the west.

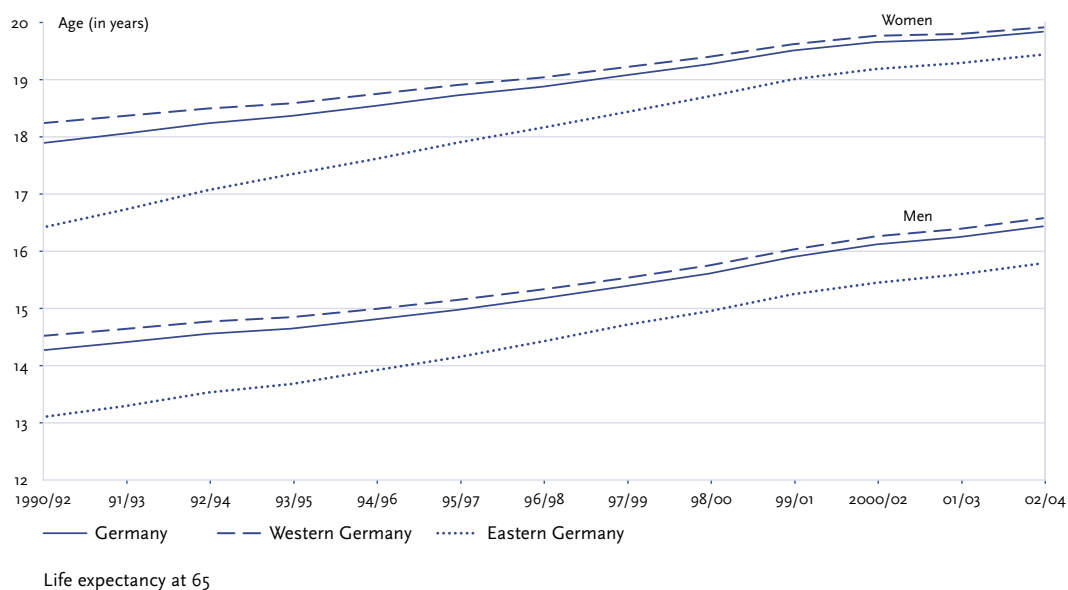
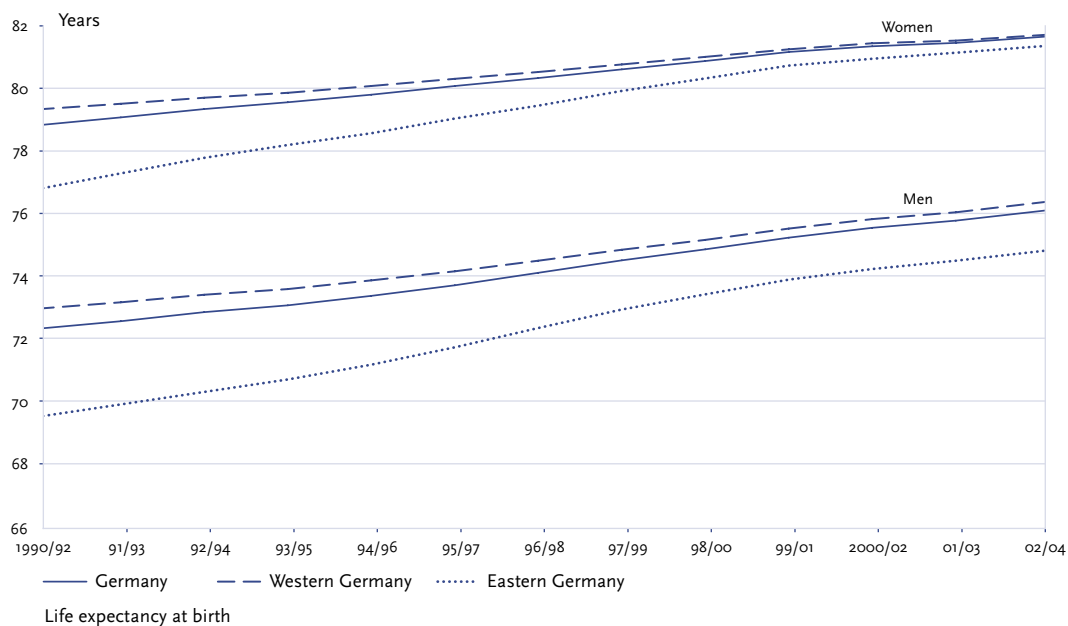
Not all population groups are benefiting from this favourable trend to the same extent. People from socially less favoured population groups are in many respects worse off in terms of their health than the average. There are gender differences, too. For instance, men die significantly more frequently than women of diseases caused by harmful working conditions or a hazardous lifestyle. Remarkably, the overall disease spectrum is evidently shifting. Although cardiovascular diseases are still among the most frequent causes of death, their frequency as a proportion of the overall mortality rate has fallen. Moreover, fewer employees are incapable of working or forced to retire early today due to cardiovascular disease compared to ten years ago. In contrast, mental disorders, which are widespread in the population, especially among women, according to data from the National Health Interview and Examination Survey 1998, are playing an ever-greater role in terms of both inability to work and early retirement.

Other illnesses which have a major impact on the national economy include muscular and skeletal disorders, such as backache and osteoarthritis.

In contrast to the trend for cardiovascular diseases, the incidence rate for cancer rose, whilst the mortality rate fell. In addition, the chance of surviving malignant tumours improved. In the decades to come, the incidence rate for cancer could rise considerably, since the proportion of elderly people in the population is expected to increase and the rate of cancer rises with advancing years.

Meanwhile, infectious diseases, which had been in rapid decline during the past decades, are again on the increase. This has much to do with mounting tourist travel, political changes (for example in Eastern Europe), a rise in hazardous behavioural patterns, and the emergence of resistant pathogens. For example, the proportion of therapy-resistant tuberculosis bacteria has been rising in recent years. In addition, the use of condoms has been falling, something which could lead to new HIV infections. The ageing of society poses the biggest challenge for the health-care system. Not only the cancer rate, but also the incidence of diseases like diabetes, osteoporosis, stroke and dementia increases with age.

The demographic change is also modifying the otherwise mostly positive overall health trends of recent years. Whilst Germans can expect to enjoy a long and mostly healthy life, more and more elderly people with chronic disorders will be in need of good treatment and healthcare in the years to come.



**Figure 1.1.1:** Life expectancy at birth and at age 65.  
 Source: Causes of death statistics, Federal Statistical Office; Population statistic



## 1.1 Life expectancy and subjective health

### ► Abstract

Between 1990 and 2002/2004 life expectancy in Germany increased among all age groups and for both sexes. For women the average increase was 2.8 years, for men 3.8 years. The gain in life expectancy was notably higher in eastern than in western Germany, meaning that the health-related harmonization process between east and west has continued. Life expectancy for women in eastern and western Germany is almost the same for those of 81 years and above.

There is also a favourable trend regarding the self-assessed health status and the level of health-related satisfaction. Three quarters of men and women over the age of 18 describe their own health status as “very good” or “good”. The proportion of people who consider their own health status as “very good” has been generally rising since the mid-1990s.

### 1.1.1. Development of life expectancy in Germany

**German men and women are continuing to live longer.** Mean life expectancy in 2002/2004 was 81.6 years for women and 76 years for men (see Figure 1.1.1 top graph). Thus, life expectancy has risen by 2.81 years for women and by 3.67 years for men since 1990. The difference in life expectancy between the sexes decreased from 6.5 to 5.6 years in the same period.

The gain in life expectancy can be attributed predominantly to the reduction in the old-age mortality rate. Furthermore, infant mortality fell considerably in the same period.

**Life expectancy in east Germany is catching up.** Although the mean life expectancy in eastern Germany is still lower than in western Germany, the gap is closing fast. Between 1990 and 2002/2004 life expectancy (excluding east Berlin) rose by 4.59 years for women and 5.27 years for men, reducing the gender gap from 7.3 to 6.6 years. By contrast, in western Germany life expectancy for women increased in the same period by only 2.38 years and for men by 3.38 years. In this case the gender gap was reduced from 6.4 to 5.4 years.

Looking at the country as a whole, men from former East Germany continue to have the lowest mean life expectancy, but they have also made the biggest gain in life expectancy since 1990. The difference between men from east and west Germany is now only 1.6 years. Life expectancy of women in eastern and western Germany is almost the same: 81.3 years (eastern Germany) and 81.6 years (western Germany).

**There are significant differences in life expectancy between the federal states themselves.** Newborn boys and girls in Baden-Württemberg had the highest life expectancy in the years 2002/2004 (see Figure 1.1.1). The lowest life expectancy was calculated for boys from Mecklenburg-Western Pomerania and girls from Saarland.

Boys and girls from Baden-Württemberg and Bavaria have the highest life expectancy rates, followed by girls from Saxony and boys from Hesse in third place.

Viewed as a whole the differences between the federal states have been diminishing since the mid-1990s.

**People who are 65 today still have nearly a quarter of their lives ahead of them.** The average remaining life expectancy of 65-year-olds in 2002/2004 (see Figure 1.1.1, bottom graph) was 19.8 years for women (eastern Germany 19.4 years; western Germany 19.9 years) and 16.4 years for men (eastern Germany 15.8 years; western Germany 16.5 years). This means an extension of life expectancy of 1.95 years for women and 2.17 years for men since 1990. The gender gap appears to be 3.4 years (eastern Germany 3.7 years; western Germany 3.3 years) and is even narrower than for mean life expectations.

#### Definition

Average or mean life expectancy is defined as the number of years that a newborn child would live on average, assuming the present mortality rates [1].

Given the continued decline in mortality expected in the decades to come, the actual life expectancy is likely to be longer than the years indicated in the current statistics. The latter can therefore not be regarded as a forecast of the actual life expectancy of a newborn child born today.

Life expectancy is rather like a snapshot that shows the actual mortality rates in concentrated form. It reflects genetic and environmental factors, as well as the social situation, the health behaviour of the population and medical care. Mean life expectancy is thus a wide-ranging measure of the population's health situation.

The remaining life expectancy is the average number of years left to live that is to be expected at a certain age. For the purposes of international comparisons, remaining life expectancy has been indicated for 40-, 60-, 65- and 80-year-olds.

#### **The social status codetermines life expectancy.**

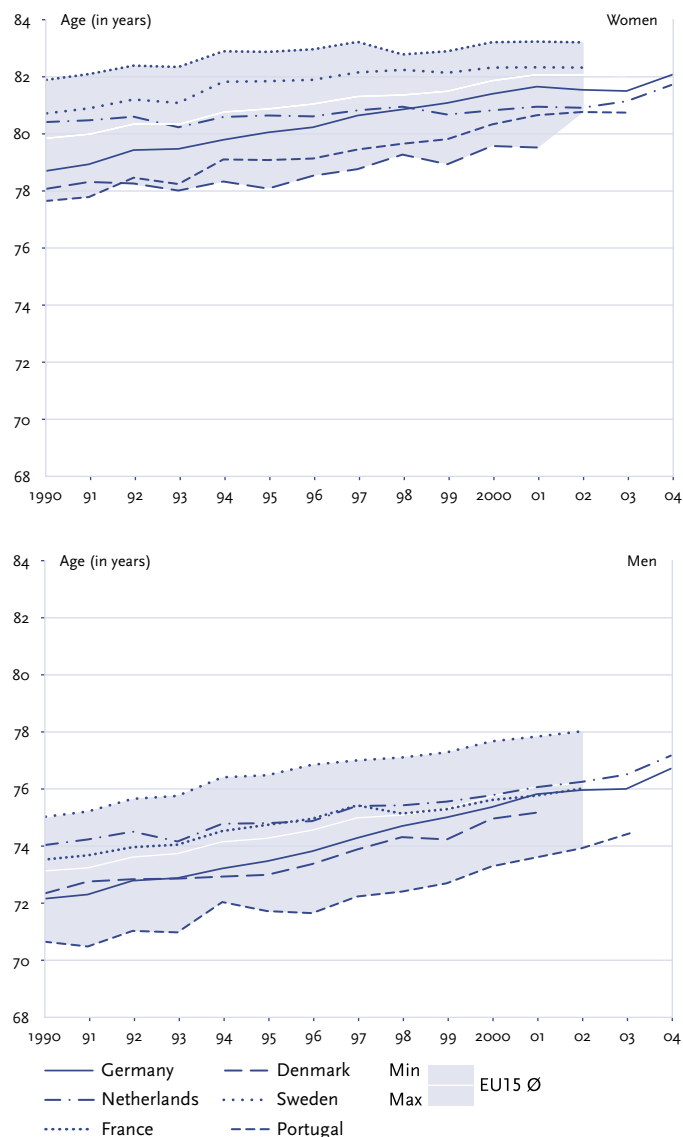
People from socially disadvantaged groups have a below-average life expectancy, a fact shown by numerous studies from other European Union countries as well as several studies from Germany. The reason for the lack of data on the influence of social status on mortality in Germany stems mainly from the fact that no information about the social status or the deceased's last occupation is shown on the death certificate. However, analyses of health insurance data show that mortality rates are significantly higher among men with low qualifications, and solitary or mandatorily insured men [4].

Assessments based on data from the so-called Socio-Economic Panel, an annual survey of now about 12,000 households in Germany, point in the same direction. According to these assessments, the life expectancy of men with “Abitur” (the school-leaving certificate qualifying for university registration) is three years higher than that of other men. For women the difference is nearly four years [5].

As shown by investigations in various European countries, the social divide has widened in the course of the last few decades. Although life expectancy is rising among socially disadvantaged groups, it is not doing so as fast as among

the socially advantaged groups, with the result that the divide is widening.

In the population groups with a higher socio-economic status the mortality rate from cardiovascular disease is falling more rapidly than among the socially disadvantaged groups. At the same time, the mortality rates for men and women with a lower socio-economic status have increased for lung and breast cancer, respiratory diseases and diseases of the alimentary tract, as well as for injuries and accidents [6]



**Figure 1.1.2:** Life expectancy at birth, European comparison  
Source: Health for All (HFA) Database (January 2006), WHO

### 1.1.2 Life expectancy, a European comparison

#### **German life expectancy is approaching the European average.**

Life expectancy of German men and women is below the European average (EU 15), but is approaching it (see Figure 1.1.2). However, it remains to be seen whether a similar development will take place in Germany to that in Denmark and the Netherlands. In these countries life expectancy for women has fallen below the European average, a fact that has been linked to an increase in tobacco consumption by Danish and Dutch women over the last few decades [3]. However, there appears to have been a reversal of the trend in the Netherlands since 2003. The proportion of female smokers has risen over the years in Germany, too. At the same time, women smoke their first cigarette at a younger age, which means that a higher mortality rate among German women is to be expected in the future.

#### **Definition**

Healthy life expectancy is defined as the proportion of life expectancy that is not burdened by health impairment.

The background to this comparatively new concept is that, for example, an extension of life expectancy does not in itself tell us whether or not the longer life expectancy is accompanied by more years lived in good health. An increase in life expectancy may be obtained by prolonging a period of ill health and lingering illness before death.

In the past decades, various approaches have been developed to link data on mortality with information on health impairment, the aim being to calculate the life expectancy weighted by the actual quality of life:

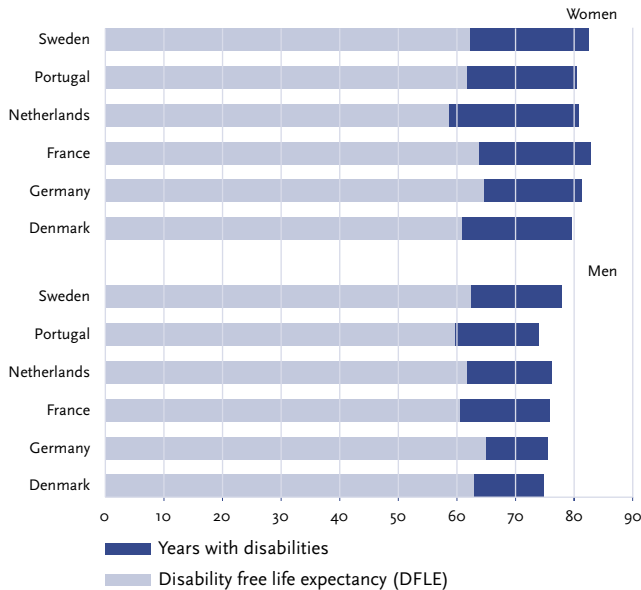
**DFLE (Disability-Free Life Expectancy):** this indicator is a measure of the number of years entirely free of health complaints. Years marked by impairment to health are entirely excluded from the life expectancy figure.

**DALE (Disability-Adjusted Life Expectancy):** given health complaints (e.g. backache) are deducted from the years lived in proportion to the level of impairment (e.g. from "no impairment" to "serious impairment").

**HALE (Health-Adjusted Life Expectancy):** by this method, which is the most intricate, years of life are also proportionately deducted from a given life expectancy. In this case however, unlike the DALE concept, a whole series of possible complaints and health parameters are included in the calculation [7, 8].

	Life Expectancy at Birth in Years	
	Girls	Boys
Baden-Wuerttemberg	82.56	77.40
Bavaria	81.92	76.47
Berlin	81.19	75.69
Brandenburg	81.11	74.60
Bremen	81.03	74.73
Hamburg	81.44	76.18
Hesse	81.82	76.43
Mecklenburg-Western Pomerania	80.83	73.84
Lower Saxony	81.51	75.75
North Rhine-Westphalia	81.16	75.64
Rhineland-Palatinate	81.28	75.88
Saarland	80.35	74.81
Saxony	81.87	75.43
Saxony-Anhalt	80.78	74.02
Schleswig-Holstein	81.42	76.02
Thuringia	81.01	74.77

**Table 1.1.1:** Life Expectancy in the German Federal States. Source: Federal Statistical Office, Press Release of 15. 2. 2006 [2]



**Figure 1.1.3:** Disability-free life expectancy in 2003. Source: Structural Indicators for Health, Eurostat

### 1.1.3 Life expectancy and health

**Women’s lives are more burdened by health complaints than men’s.** The World Health Organization has published data on weighted life expectancy according to the HALE concept for the years 2000 to 2002 [9], according to which the healthy life expectancy for women in Germany in 2002 was 74 years. 7.6 years were spent under conditions of impaired health. By contrast, the healthy life expectancy for men was 69.6 years. On average they lived with health impairments for 5.9 years.

The European Union subsequently integrated a unit for measuring value, the Healthy Life Years Indicator, which corresponds to the DFLE concept, into the core set of European structural indicators. Compared to other EU member states it can be seen that life expectancy free of health complaints is relatively high in Germany (see Figure 1.1.3). It also shows clearly that in every member state women spend a greater proportion of their lives with health complaints than men, while there is only a minor difference between the sexes in terms of healthy life expectancy.

### 1.1.4 Subjective health

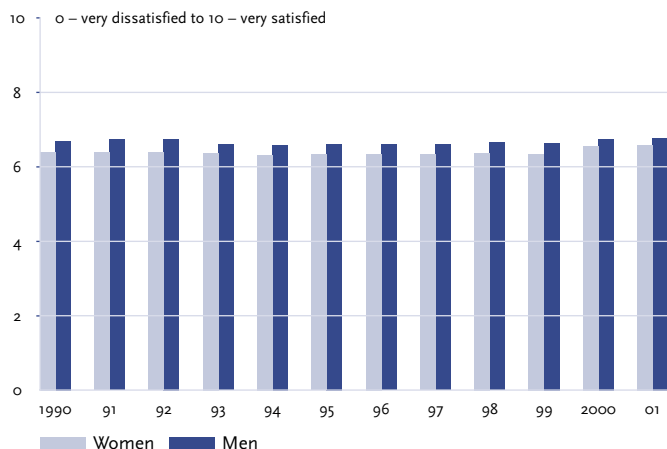
**Most Germans are satisfied with their health.** As representative surveys show, on a scale from 0 to 10, the level of satisfaction with health among men in Germany is about 6.5, which makes men somewhat more satisfied with their health than women. The extent of satisfaction and the difference between the sexes in this respect have hardly changed at all over the last ten years (see Figure 1.1.4).

**The assessment of the self-perceived health status becomes less positive with increasing age.** In 2003, three quarters of Germans over the age of 18 assessed their own health status as “good” or “very good”. Only seven percent of women and six percent of men assessed their health as bad or very bad. For both sexes, the positive assessment gradually declines with advancing years. Significant gender differences in this regard can be

#### Definition

The measures of subjective health comprise the personal and social aspects of how a person feels. In many cases they are just as important, or even more important, than objectively measurable quantities when making recommendations for action in the area of health policy. In Germany, subjective health is investigated in population studies by two principle methods: personal health satisfaction is a value marked on a scale of 0 to 10, showing the level of satisfaction of the person interviewed with his or her general state of health. Along with genuine ailments and illnesses, the subjective assessment includes attitudes to health, values, social comparisons, or fears. In addition, changes in societal developments can affect a person’s assessment of their own health even if there has been no change in the objective health status. Frequently, in order to obtain a self-perceived health assessment a simple question such as “How is your health in general?” was asked. As a rule the question should be answered using one of five possible values (“very poor”, “poor”, “fair”, “good”, “very good”). The authenticity of the answers has proved to be reliable.

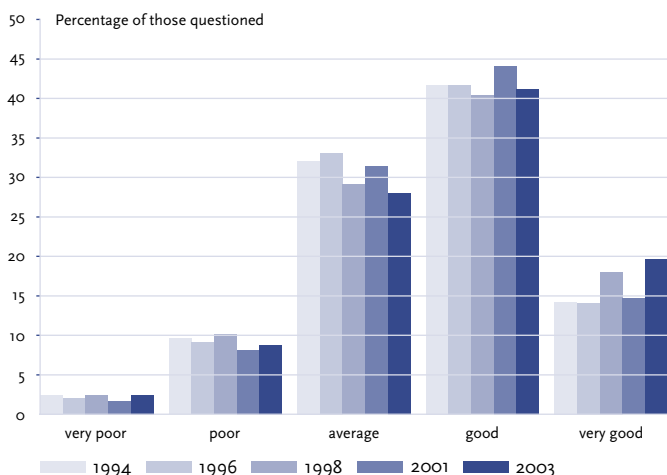
German and international longitudinal studies have shown that self-perceived health assessment is a partial predictor of future mortality [10–12]. Self-perceived health assessment may possibly influence the motivation to change hazardous lifestyles, for instance to stop smoking or to abandon a lack of physical activity. Not least in importance, a person’s experience and awareness of their own health status is a contributory factor in determining their active participation in social life.



**Figure 1.1.4:** Mean value of the results for Germans' evaluation of level of satisfaction with their own health. 1990 – 2001. Source: SOEP, German Institute for Economic Research

seen in the population group over 65 years of age. In this age group men give a slightly more positive assessment of their self-perceived health than women [13] (see Table 1.1.2).

As in the case of satisfaction with health there has been hardly any recent change in the assessment of self-perceived health [14]. On all points in the survey, the majority of those asked gauged their own state of health as being between “satisfactory” and “good”. The proportion of those who characterize their health as “poor” is consistently low and in no case exceeds the three percent mark. The proportion of the population assessing their health as “very good” tended to increase between 1994 and 2003 (see Figure 1.1.5).



**Figure 1.1.5:** “How would you describe your present state of health?” Subjective assessment by Germans of their own state of health, 1994 – 2003. Source: Representative survey by the University of Leipzig, 1994 – 2003 [14]

	Men					Women				
	18–29	30–44	45–64	65+	TOTAL	18–29	30–44	45–64	65+	TOTAL
Very Good	33.6	28.0	15.7	9.3	21.8	33.6	27.2	17.3	7.6	20.4
Good	56.5	58.9	53.0	44.8	54.1	53.1	55.7	50.3	36.4	49.0
Average	9.0	10.3	22.4	34.3	18.2	11.4	13.6	25.7	42.1	23.8
Poor	0.7	2.3	7.4	9.6	4.9	1.6	2.7	5.5	10.8	5.3
Very Poor	0.1	0.5	1.5	2.1	1.0	0.3	0.8	1.3	3.1	1.4

**Table 1.1.2:** Self assessment of health according to age and gender (in percent N = 8 318). Source: Telephone Health Survey 2003 (GSTelo3), Robert Koch Institute

## 1.2 The burden of disease

### ► Abstract

In Germany an estimated four million people are diagnosed with diabetes; one woman in five and one man in seven suffers from chronic back pain; over 400,000 people develop cancer, and nearly as many die of cardiovascular disease. These figures highlight the burden of disease in the German population.

The disease spectrum has been dominated for decades by two groups of illnesses: cardiovascular disease and cancer.

Recently, however, there have been important shifts in this pattern. Cardiovascular diseases, although still at a high level, are becoming less important than they used to be. Since 1990 mortality from myocardial infarction has only increased among women over 90 years of age and has decreased for all other age groups in men and women. For certain kinds of cancer there have also been some remarkable changes in time trends. The frequency of lung cancer among women is increasing, but decreasing among men. Presumably this is linked to the increase in tobacco consumption among women. Along with smoking, overweight, a lack of physical activity, high blood pressure and fat metabolism disorders are the risk factors responsible for a major part of the disease burden among Germans.

These risk factors are for the most part determined by a specific mode of behaviour and lifestyle; changing this is the aim of a wide range of health-policy measures. Another cause of the shifting disease spectrum among Germans is demographic change. Dementia is expected to double by 2050 as a result of the increasing percentage of elderly and old people in the population. Similarly, the frequency of other diseases typical of advanced years, such as cancer, diabetes, osteoporosis and stroke, is expected to increase.

### Data basis

In Germany, standardized and validated data sources are lacking for a large number of diseases. To determine the frequency of a widespread complaint such as backache specific investigations are required. Other illnesses require the compilation of information from different sources and their comparison. This complicates statements on the actual causes of diseases, variations of age, gender and region, or time trends.

Available information, which is gathered on a regular basis, is primarily obtained from several players involved in the health system (e.g. hospitals, insurances, physicians):

Information on in-patient treatment can be obtained from hospital diagnosis statistics. This includes data about the principle discharge diagnosis, duration of stay and the competent department where the patient was treated for the longest period. However, the statistics reflect not only changes in the health situation of the population, but also changes in healthcare delivery, triggered for instance by new health-policy guidelines.

Regional cancer registries provide data on cancer, from which national figures on incidence and survival can be estimated. Until the reunification of Germany, the data from the Saarland Registry was the principal source of information on cancer in western Germany, while the former GDR had a national cancer registry with a recognized high rate of registra-

tion at its disposal. Since 1990 the Central Cancer Surveillance Programme at the Robert Koch Institute has based its estimates on the annual number of cancer cases on data from regional cancer registries where case registration is complete.

The Robert Koch Institute collects data and compiles statistics on notifiable, infectious diseases. In so-called sentinel-network surveys, selected care centres such as physician's practices or hospitals also work together to provide information about the prevalence of certain infections, for example influenza, measles and sexually transmittable diseases.

Data from statutory health insurance institutions provides information on the duration of hospital stays, absenteeism from work, ordered medical devices and prescribed medication. Using data from statutory pension funds and workers' compensation insurance, it is possible to conduct analyses of occupational diseases and occupational accidents, restrictions on people's ability to work and the use of rehabilitation services. Statistics on severely disabled persons, long-term nursing-care insurance statistics, perinatal surveys and school-entry health examinations are likewise all available as data sources. In addition, the legal requirements on using data on insured persons and service providers, such as health-insurance data, were laid down in 2004. Such data in edited form were made available for use by the information systems of federal and state health monitoring.

Mental diseases such as depression and phobia are also gaining in importance and already play a major role – affecting the number of people who are unable to work or retire early. The increasing number of people affected by psychic diseases, as shown in health surveys among the population, may be attributed in part to an increase in mental strain.

Infectious diseases have their own dynamics; in sharp retreat over the last few decades, they have been gaining in importance again in recent times. A case in point is the increasing proportion of resistant tuberculosis bacteria in the past few years. In addition, pathogenic agents are spreading rapidly throughout the world in the wake of global trade and tourist travel. The World Health Organization believes that the avian influenza virus present in southern Asia could trigger a global influenza epidemic.

However, nearly all these sources of information only provide information about persons who have already been in contact with the healthcare system and, for example, have been treated by a physician or operated on in a hospital. When healthcare services are not called upon to help with a complaint, the case does not usually appear in any available routine data. Similarly, such data do not provide information on the real quality of life of the German people or the influence that unequal living conditions have on health and opportunities to take part in social life. Population studies such as health surveys are necessary to close this gap. Thus, the German National Health Interview and Examination Survey in 1998 – which used questionnaires and medical examinations of people in a nationwide, representative sample – produced data on the frequency of diseases and complaints, on subjective health and the quality of life, on the population's health-behaviour patterns and on healthcare.

In the same way, using additional modules it was possible to gain information on dietary habits, psychological impairments and environmental stress factors. In addition to all this, questions were asked concerning work, family and housing conditions. Time trends can be analysed by comparing the results with those of earlier national surveys on health (1984–86, 1987–89 and 1990–91), the East German Health Survey (1991–92) and the Telephone Health Surveys (2002/03 and 2003/04).



Figure 1.2.1: Prevalence of diabetes mellitus by age group among 18- to 79-year-olds. Source: BGS98, Robert Koch Institute

### 1.2.1 Diabetes

#### ► Abstract

There are an estimated 4 million people with diabetes living in Germany. 80 to 90 percent of them are suffering from what is called type 2 diabetes, which becomes more frequent with advancing age. Owing to the growing proportion of elderly people in the population, the number of diabetics has probably increased considerably in the last few decades. The development of type 2 diabetes is related to overweight, physical inactivity and poor social conditions.

**At least one person in 20 has diabetes in Germany.** On the basis of various studies carried out since the end of the 1980s, it has been estimated that around four million men and women in Germany are diagnosed as diabetics, about five percent of the population [16–19]. The number of people with diabetes has probably risen considerably over the last few decades. Apart from an increase in incidence rates in some age groups, this development is predominantly due to the growing proportion of elderly people in the population.

Despite these long-term trends, the frequency of the disease stagnated in the 1990s.

When the data from the 1998 Central Health Survey (BGS98) are compared with the 1990/91 surveys, there appears to have been no increase in the frequency of diabetes. In the so-called MONICA surveys (Monitoring Trends and Determinants in Cardiovascular Disease), too, there was no increase in the number of diagnosed cases of diabetes in the study area of Augsburg over the 15 years during which the study was carried out. Data from northern Europe (Sweden, Norway) show a relatively constant level of frequency for the adult population over the last 15 years [20].

**Age, gender and social situation affect the risk of diabetes.** The results of the survey show that diabetes becomes more frequent with advancing age (see Figure 1.2.1).

There are marked differences between the sexes: men are more often affected than women in the age group up to 70 years; after that age, women are more often affected. The prevalence of the disease is higher for all groups of the population in eastern than in western Germany.

Social status also affects the prevalence of diabetes. The BGS98 shows that 5.6 percent of men with a lower socio-economic status (SES), 3.5 percent with a medium SES and 2.5 percent with a high SES have non-insulin-dependent diabetes (as a rule type 2 diabetes). 8.5 percent of women with a lower SES

#### Comments on the choice of diseases

The burden of disease on Germans is illustrated by selected examples. Diseases have been chosen which play a particularly important role in determining the state of health of the population, or which constitute a heavy cost burden, or can be prevented or affected by health-policy measures.

Cardiovascular diseases and cancer account for nearly 70 percent of all deaths in Germany. In addition, risk factors for cardiovascular diseases are among the most common findings recorded in primary care – both general and medical. As far as the future status of the German population's health is concerned, the particularly important diseases are those

that arise predominantly in advanced age and will increase with the ageing of the population. Among such illnesses are dementia-related disorders and osteoporosis.

The cost of illness is of similar interest. Cardiovascular diseases cause high costs for direct treatment (Euro 35 billion a year), digestive disorders together with dental diseases and prostheses Euro 31 billion, muscular and skeletal disorders Euro 25 billion, mental and behavioural disorders Euro 22 billion and cancer Euro 15 billion [15].

Infectious diseases have to be seen in a global context. Political changes in some countries have led to poorer socio-economic and hygienic conditions, whilst international trade and trav-

el is on the increase. The emergence of resistant pathogens and the decline in the use of condoms have led to a revival in the incidence of some specific infectious diseases. One important selection criterion is whether a disease can be prevented or affected by measures in the field of health policy. Preventive programmes, especially in the case of chronic diseases such as diabetes, therefore play an increasingly significant role. In addition, disease-management programmes can improve healthcare for the chronically sick. Numerous disease-management programmes have recently been approved for type 2 diabetes, breast cancer and cardiovascular disease.

had diabetes, 3.4 percent with a medium SES and 1.6 percent with a high SES [21].

An estimated 5 percent of all diabetics have type 1 diabetes, which usually arises among children and adolescents as a result of an autoimmune process.

A further 5 to 15 percent of diabetics – mostly elderly people – who have hitherto been regarded as type 2 diabetics on the basis of the clinical picture, may actually be showing a delayed occurrence of type 1 diabetes, the so-called latent autoimmune diabetes in adults (LADA) [22].

On balance, it is reasonable to suppose that 80 to 90 percent of all diabetics have type 2 diabetes.

**Type 1 diabetes is becoming more frequent among children.**

An estimated 0.14 percent of children and adolescents under the age of 20 suffer from type 1 diabetes; there is no difference between the figures for boys and girls.

This percentage corresponds to about 25,000 type 1 diabetics in this age group in Germany [23].

For other age groups, the prevalence of type 1 diabetes is between 0.2 and 0.3 percent, with slightly more men affected than women. In Germany, therefore, there may be 200,000 people suffering from type 1 diabetes [24].

It has been observed in Germany, as in other countries [25], that type 1 diabetes is becoming more frequent among the under-15-year-olds and that it occurs somewhat more often among girls than boys in this age group. A study in the Düsseldorf region (North Rhine-Westphalia) between 1987 and 2000 showed an increase in incidence of 4.3 percent per year for girls and 3 percent for boys [26]. Comparisons of these figures with those of the Diabetes Registry of the former German Democratic Republic (GDR) indicate that incidence and prevalence are about twice as high as they were in the late 1980s [27].

It remains an open question whether the incidence of type 2 diabetes is also increasing at an earlier age. A rising prevalence of type 2 diabetes has been observed among adolescents from certain population groups, especially members of ethnic minorities in the USA, [28] although it has not proved possible to confirm these figures either in groups outside the ethnic

minorities studied or in any European countries [29]. To date there are no representative population-based data for Germany. Studies do show, however, that there is a heightened risk of type 2 diabetes in extremely overweight children with a corresponding family predisposition for diabetes [30].

**A healthy lifestyle reduces the risk of diabetes.** Type 2 diabetes, in contrast to type 1, is closely linked to lifestyle. It is known that the risk of the disease is heightened by overweight, malnutrition and lack of physical activity. Conversely, persons at risk of diabetes can significantly lower their risk by means of a modest weight reduction, a low-fat and high-fibre diet and a moderate fitness programme. Correspondingly, there are ample ways for the prevention of the disease. Gesundheitsziele.de is a national platform that brings together health-insurance representatives, health-service providers, ministries and other socio-political players. It has formulated three important health-policy aims for type 2 diabetes. They are: first, reduce the number of new cases, in other words strengthen primary prevention; second, it is crucial that the correct diagnosis of type 2 diabetes be made at an early stage of the disease before complications have arisen (secondary prevention and early detection); third, the quality of life of people with type 2 diabetes should be improved and complications (late diabetic syndrome) kept to a minimum (medical treatment and rehabilitation).

These aims can be reached, at least partially, by means of disease-management programmes (DMPs) and integrated-care projects, the purpose of which is to ensure qualified treatment nationwide. The primary purpose of DMPs is to prevent, or at least delay, the onset of complications and secondary diseases through coordinated and continuous care and treatment.

► Comprehensive Information on **Diabetes mellitus** can be found in booklet 24 of the Federal Health Reporting's series [31].

## Definition

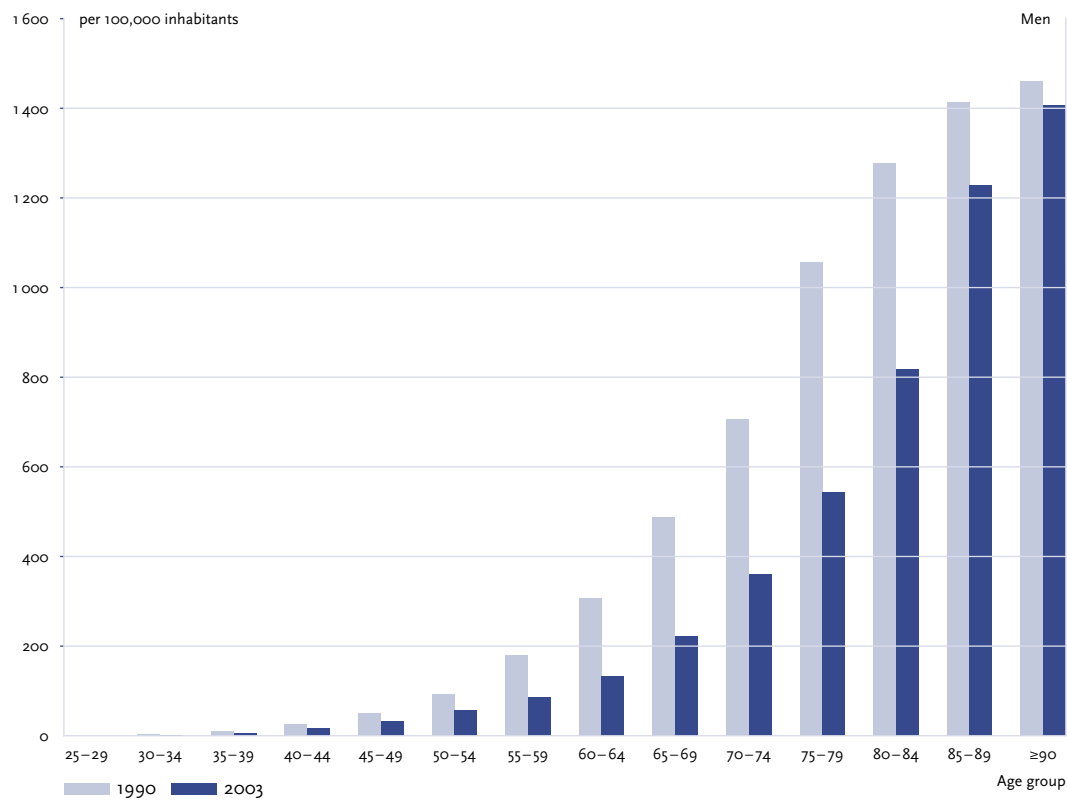
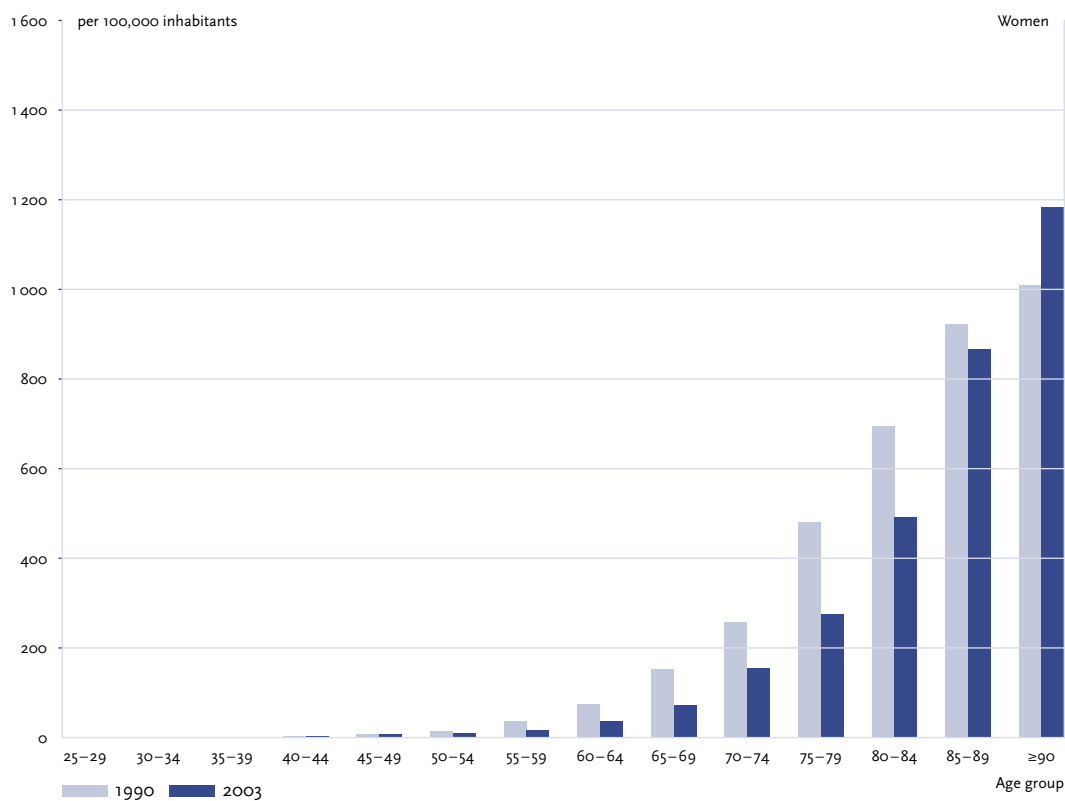
Diabetes mellitus includes a group of illnesses characterized by chronic high blood glucose levels.

Type 1(a), usually simply called type 1, mainly occurs in children and adolescents or young adults with an incidence apex between 10 and 15 years of age. The illness is caused by an autoimmune destruction of insulin-producing cells (so-called beta cells or islet cells) in the pancreas. Advanced loss of islet cells leads to insulin deficiency, which is fatal if left untreated.

For this reason, insulin has to be substituted by external injections several times during the day.

Type 2 diabetes affects mainly people over the age of 40, with frequency increasing with age ("adult-onset diabetes"). The clinical picture is a complex one: through the interplay of hereditary factors and additional factors such as overweight, the effect of insulin in the tissue changes, leading to what is known as insulin resistance, a diminished response of the body cells to the insulin hormone. At the same time the secretion level of insulin in the pancreas falls. The result is impairment of the blood glucose level and other metabolic systems such as fat metabolism.

Other diseases often accompany type 2 diabetes: the typical combination of overweight, high blood pressure and disorders of fat and glucose metabolism in combination with insulin resistance is known as metabolic syndrome. The syndrome increases the risk of cardiovascular diseases such as heart attacks and strokes.



**Figure 1.2.2:** Age-related trends in the mortality rate for acute myocardial infarctions in Germany by sex per 100,000 inhabitants, in 1990 and 2003. Source: Causes of Death Statistics, Federal Statistical Office, 1990: ICD-9: 410; 2003: ICD-10: I21



### 1.2.2 Cardiovascular diseases

#### ► Abstract

Cardiovascular diseases continue to be the most common cause of death for both men and women in Germany. In addition, they are a common cause of premature death before the age of 70 and lead to a considerable loss of potential life years. Moreover, the treatments for cardiovascular diseases – taken together – constitute the highest health treatment costs, especially for coronary heart disease and stroke.

Nevertheless, cardiovascular diseases have become less significant than they were in 1990. Since 1990 the only group in which the number of cases has been increasing is women over 90 years of age; in all other groups of both men and women the number of cases is falling. At the same time the mortality rate from strokes has fallen considerably.

The cardiovascular risk is increased by cigarette consumption, overweight, a lack of physical activity, high blood pressure, lipometabolic disorders and diabetes mellitus. These risk factors, mainly attributed to personal lifestyles, are among the most frequent findings by general practitioners and internists in the diagnosis of their patients.

	Women (%)	Men (%)
<b>Pain location and referred pain</b>		
Behind the sternum	88	88
Left arm	56*	46
Right arm	28	25
Back/left shoulder blade	36*	19
Jaw/Neck angle	29*	21
Upper abdomen	9	8
<b>Accompanying pains</b>		
Cold sweat	47	46
Breathing difficulties	47	40
Necrophobia/Feelings of dread and apprehension	35*	18
Nausea without vomiting	24	19
Nausea with vomiting	17*	9

\* complaint significantly more frequent among women than men over the same time period.

**Table 1.2.1:** Acute Symptoms of Cardiac Infarction among 25-74 years old women (N = 359) and men (N = 1115), asked in the survey during their hospital stay. Source: Data of the MONICA/KORA Myocardial Infarction Register Augsburg 2000/02

#### 1.2.2.1 Coronary heart disease and acute myocardial infarction

##### *The symptoms of infarction are different in men and women.*

Compared to men, the symptoms of myocardial infarction in women may be very different. This has been shown for example by interviewing infarction patients from the Augsburg region (see Table 1.2.1). However, because insufficient attention has been paid to this fact, by both medical staff and the population as a whole, therapy for women often begins later than for men, a state of affairs which is liable to raise the fatality rate. Generally speaking, an emergency doctor should be called as quickly as possible if severe symptomatic complaints suggesting a heart attack continue for several minutes. The expression “golden first hour” is used in infarction therapy because the first hour is the best time for restoring myocardial circulation. After six hours the results of oxygen deficiency are virtually irreversible.

**Mortality from myocardial infarction continues to fall in Germany.** According to official statistics on causes of death, 29,550 women and 34,679 men died of acute myocardial infarction in 2003, 6.5 percent of all deaths in that year for women and 8.7 percent for men.

If we compare these figures with those for 1990 we can see an evident decline in infarction mortality. The age-adjusted mortality rate among women decreased from 48 to 32.4 deaths from infarction per 100,000 inhabitants. In the same period the figure for men fell from 127.6 to 71.4 per 100,000 inhabitants.

The only increase in mortality from myocardial infarction has been observed among women over 90 years of age. In all other age groups of women and in all age groups of men mortality rates are falling (see Figure 1.2.2).

**In Saxony-Anhalt cardiovascular deaths occur more often than in Baden-Württemberg.** Beside age and gender, it is possible that regional differences contribute to the cardiovascular mortality rate.

Data from 2003 show that both total and cardiovascular mortality varies considerably from one federal state to another (Figure 1.2.3). It remains unclear, however, whether this reflects genuine differences in the mortality risk. It might, for example,

#### Definition

Coronary or ischaemic heart disease is a chronic disease of the coronary arteries, in which the narrowing or stenosis of one or more arteries leads to cardiac ischaemia (restriction of blood flow to the heart muscles).

This narrowing of the arteries is caused by calcification of the arteries (arteriosclerosis) and is primarily caused by cigarette consumption, high blood pressure, lipometabolic disorders and Diabetes mellitus.

Coronary heart disease can lead to chest pains (Angina pectoris), cardiac insufficiency and acute myocardial infarction (heart attack). Myocardial infarction, in the course of which cardiac muscle tissue dies off as a result of a drastic reduction in blood circulation, is recognized as a major complication of coronary heart disease and is accompanied by a high fatality rate.

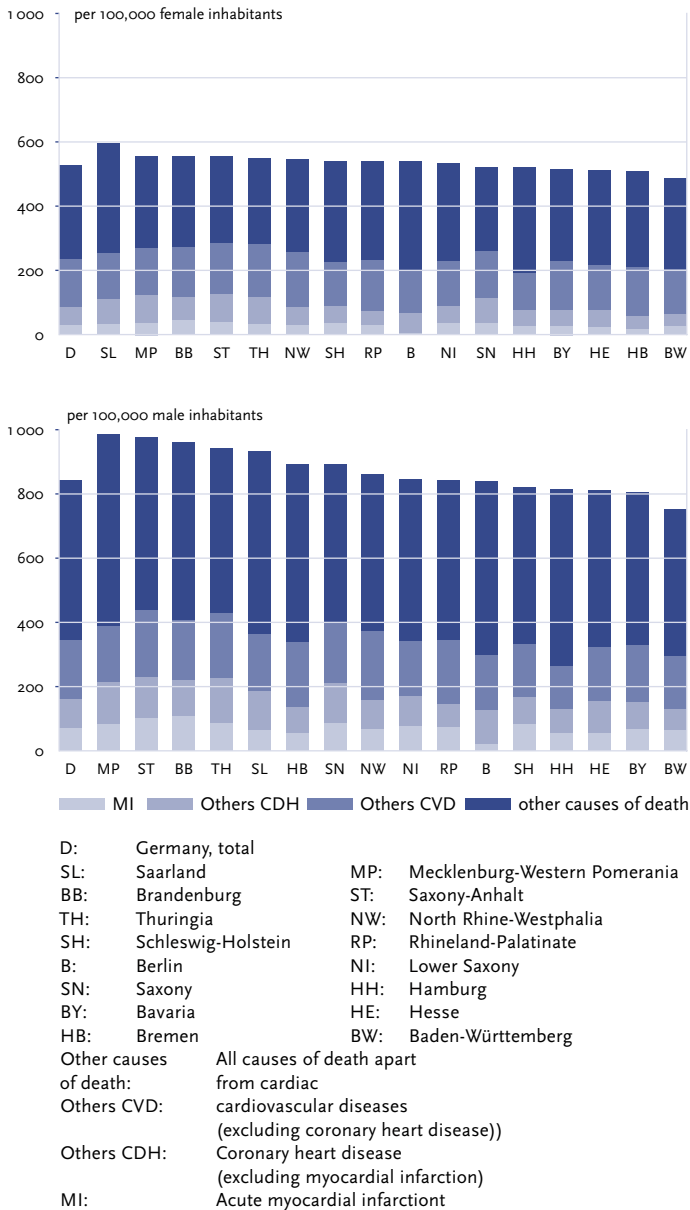
#### Data basis

In order to monitor the time trends for coronary heart disease, the World Health Organization (WHO) initiated the MONICA project (Monitoring Trends and Determinants in Cardiovascular Disease) in the late 1970s. The purpose of this study was to analyse trends and determinants of cardiovascular mortality, incidence and

case fatality over a period of ten years, and also to examine trends in medical care. The study included 37 population groups from 21 countries. The age of the participants ranged from 25 to 74. The analytical tools were myocardial infarction registries and population surveys.

In the Augsburg area, one of the three German regions that participated in the study, the

cardiovascular research was continued after the WHO project had finished. The Augsburg Registry continued providing annual data on the frequency of strokes, offering a valuable addition to nationwide statistics on causes of death and national hospital diagnosis statistics.



**Figure 1.2.3:** Age-standardized deaths per 100,000 inhabitants in 2003, by federal state and causes-of-death classifications. Source: Causes-of-death statistics, Federal Statistical Office

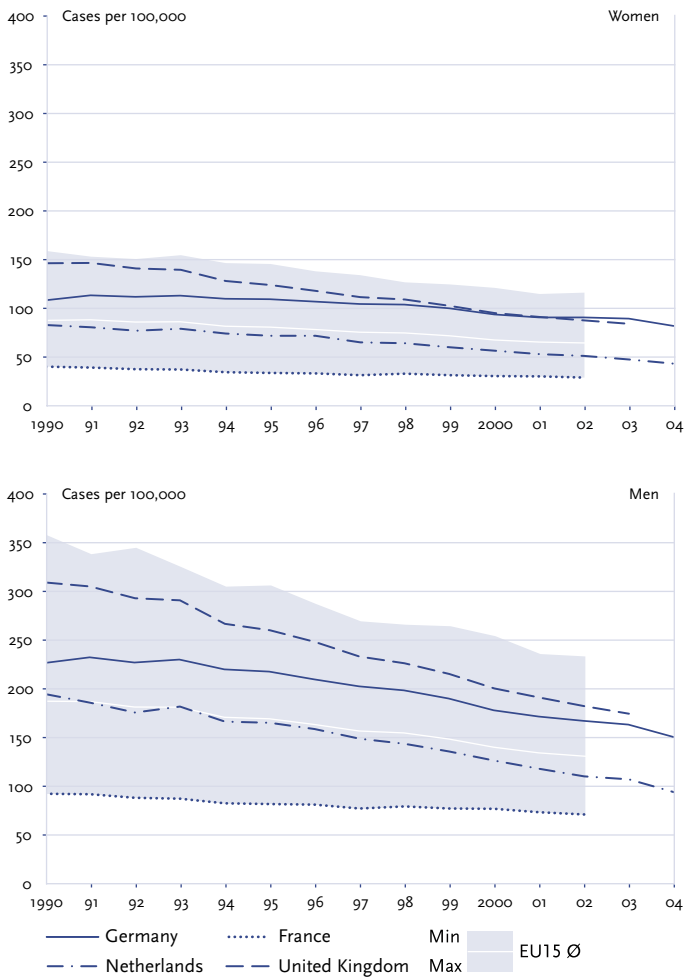
be the case that physicians assess the cause of death according to slightly different criteria from one federal state to another.

**The chances of surviving myocardial infarction are improving.** According to data from the Augsburg myocardial infarction registry, the proportion of infarction patients who die before reaching the hospital or during their first days in hospital has fallen since 1985. This is closely linked to improved emergency care. According to the data, better acute treatment and rehabilitation have reduced the risk of men and women over 65 suffering another heart attack. Nevertheless, even good therapy can only partially influence mortality figures. Ninety percent of all heart attack deaths still occur before the patient has reached the hospital or during the patient’s first day of treatment. A large proportion of these fatal infarctions might be avoided by consistent prevention of risk factors and the fastest possible medical care.

**The proportion of women suffering from myocardial infarction is rising, but men are still more frequently affected.** In the case of men, the rate of deaths due to myocardial infarction (mortality), like the rate of new infarctions (incidence) has fallen. At least that is what the figures from the Augsburg region show. A falling incidence rate can also be observed in women between the ages of 55 and 75, while the incidence in women between the 25 and 54 is rising. The increase correlates with higher cigarette consumption among the female population and with women starting to smoke at an earlier age [32]. Despite this, it is men who are mainly affected by heart attacks. In their earlier years they are eight times more likely to have myocardial infarction and nine times more likely to die from it than women of the same age. After the age of 65 the risk for men is three times higher than women. From the age of 85 there is no longer any appreciable difference. Only at very advanced ages is the infarction mortality rate higher for women than for men. Altogether, the age-standardized incidence and mortality rate is twice as high for men as it is for women (see Table 1.2.2).

**Germany leads Europe in cardiac catheter examinations.** The age-standardized mortality rate from coronary heart disease in the European Union (EU-15) has been falling since 1990 (see Figure 1.2.4). This downward trend is considerably more marked among men than women, although the figures starts from a higher level. Germany’s mortality rates here are mid-table but above-average by EU standards.

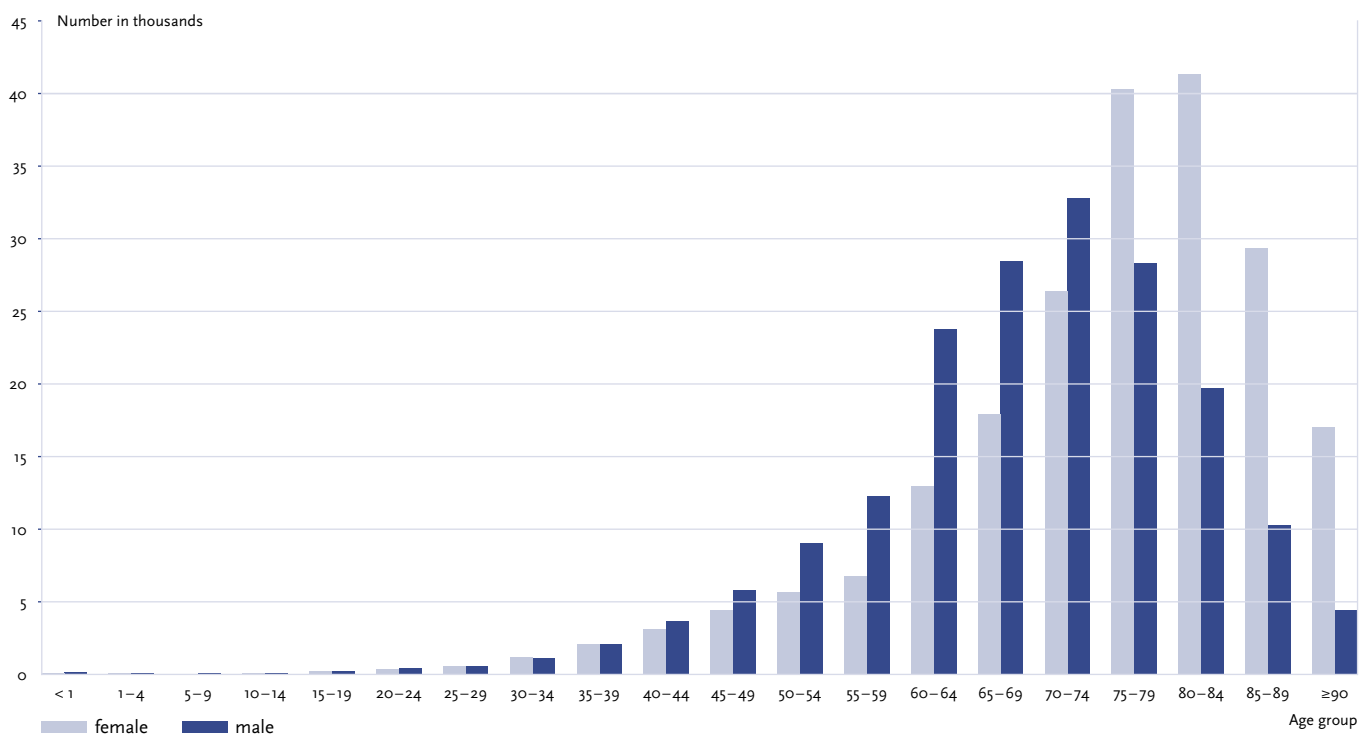
Fewer people tend to die of heart attacks in southern Europe than in northern Europe. The number of coronary artery interventions rose in Europe between 1992 and 2001. Compared to other European countries, Germany is in the front rank both in terms of the number of cardiac catheter examinations carried out and in angioplasty (balloon dilatation, PTCA) [33].



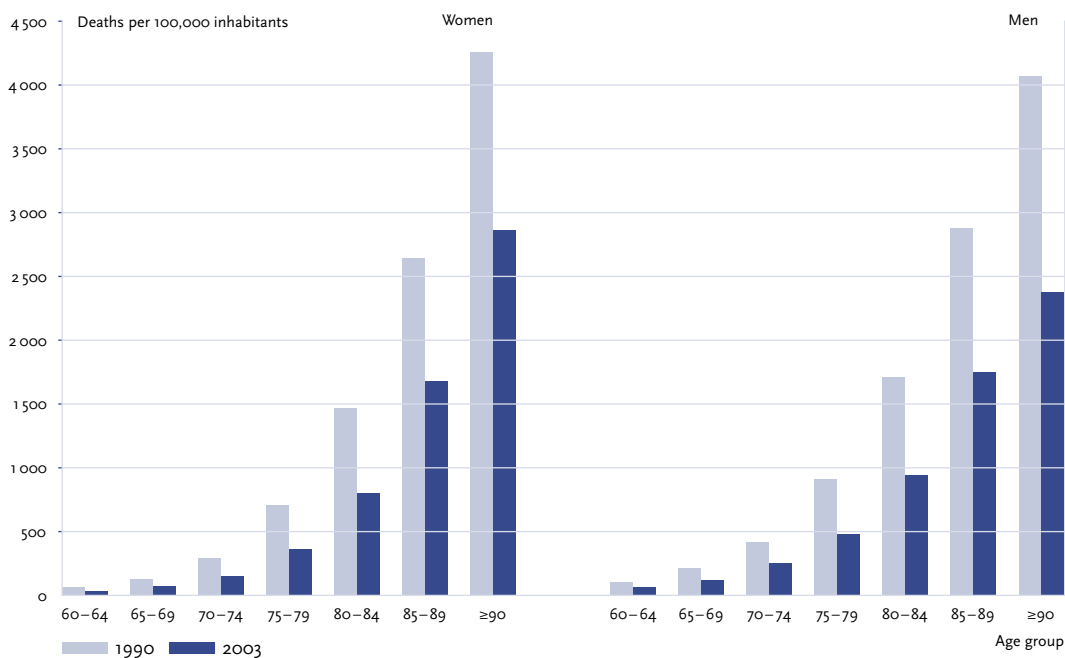
**Figure 1.2.4:** Mortality from coronary heart diseases.  
Source: HFA-Database(January 2006), WHO

Age Groups	Men		Women		Men to Women	
	Morbidity Rate	Mortality Rate	Morbidity Rate	Mortality Rate	Morbidity Rate	Mortality Rate
	Register 2000/02	Register 2000/02	Register 2000/02	Register 2000/02	Register 2000/02	Register 2000/02
25-29	2	0	2	2	1	-
30-34	22	11	3	0	8.2	-
35-39	45	10	6	0	7.4	-
40-44	120	28	24	7	5.1	4
45-49	247	76	39	8	6.3	9.4
50-54	386	95	93	29	4.1	3.2
55-59	524	189	120	48	4.4	4
60-64	759	368	207	80	3.7	4.6
65-69	1072	500	351	167	3.1	3
70-74	1578	913	667	403	2.4	2.3
75-79	1705	1279	895	671	1.9	1.9
80-84	2744	2195	1714	1371	1.6	1.6
≥85	5129	4464	4392	3846	1.2	1.2
Age standardised total mortality rate	478	291	229	161	2.1	1.8

**Table 1.2.2:** Cardiac infarction morbidity and coronary mortality in Germany per 100,000 inhabitants according to age and gender 2000/02 on the basis of data from the region of Augsburg. Source: Age Group 25-74: MONICA/ KORA Myocardial Infarction Register Augsburg 2000/02; Age Group ≥ 75 using data from the Cause of Death Statistics 2002



**Figure 1.2.5:** Number of in-patients discharged from hospital in 2002 suffering from cerebrovascular diseases, by age and sex. Source: Hospital Diagnoses Statistics, Federal Statistical Office, ICD-10: I60 – I69



**Figure 1.2.6:** Age-related trends in the mortality rate from cerebrovascular diseases among men and women over 60 in Germany, per 100,000 inhabitants in 1990 and 2003. Source: Causes-of-death statistics, Federal Statistical Office, 1990: ICD-9: 430 – 438; 2003: ICD-10: I60 – I69

### 1.2.2.2 Stroke

**The symptoms of a stroke vary and often follow a different course in women compared to men.** The acute complaints arising from a stroke depend on the extent of the damage and the brain region affected. There are nevertheless typical symptoms, including a sudden feeling of weakness or paralysis on one side of the body, numbness in a wide variety of body regions, impediments of speech, hearing and vision, a violent headache, severe vertigo and unconsciousness. Women's complaints are often different to those of men and can include pain or disorder of consciousness [34]. Immediate medical treatment within the first six hours is decisive for successful treatment, but prompt therapy is hampered by the fact that many of those affected, especially those who have reached retirement age, as well as their friends and relations, are not sufficiently informed about the symptoms of a stroke [35]. A health survey conducted by telephone in 2004 [36] showed that some groups of the population were better informed about strokes than others. Women recognize the symptoms somewhat better than men. Knowledge about strokes is greatest among the middle-aged of both sexes. Intensive education, above all for the high-risk group of elderly people, appears to be necessary.

**Most strokes occur among people over 60 years of age.** Apoplexy is a common illness. Among cardiovascular disorders, strokes rank third in hospital diagnosis statistics [37]. The frequency of strokes increases with advancing age (see Figure 1.2.5). Nearly 85 percent of all strokes occur among people over the age of 60. The frequency of occurrence can be expected to rise in the future due to the demographic ageing process.

Estimates of the incidence rate are possible using the Erlangen Stroke Registry, according to which the annual age-standardized incidence of strokes is 182 cases per 100,000 inhabitants. With 200 cases per 100,000, men are more frequently affected than women with 170 per 100,000 [38].

**Fewer and fewer Germans are dying of stroke.** Death from a stroke is the fourth most common cause of death among women and the fifth among men. But a comparison of figures between 1990 and 2003 shows that stroke mortality has fallen significantly (see Figure 1.2.6). One contributory factor to this trend could be advanced methods of examination and treatment [39].

In line with international standards, the Erlangen Stroke Registry records when people die of a stroke [40]. According to these results, 19.4 percent of patients having their first stroke die within 28 days of the attack. The percentage of those dying within three months of their first stroke rises to 28.5; within twelve months the figure is 37.3 percent. About one person in three who suffers a stroke dies within a year. The highest case fatality is among patients whose stroke was caused by cardiac embolism.

**The mortality rate in Germany has been below the EU average since the 1990s.** In terms of both new cases (incidence rate) and mortality rates there are differences between the European countries. Data from three stroke registries in Germany, France and the UK were compiled by the European network "European Registries of Stroke" (EROS). Between 1995 and 1997 the incidence rate was highest in Germany and lowest in France. To date, the reasons for these differences have not been conclusively clarified. One explanation may lie in variations in the occurrence of stroke risk factors [38]. The differing incidence rates in various European countries led members of the World Health Organization and the European Stroke Council in 1996 to define a common standard for the acute treatment, rehabilitation and prevention of strokes [40].

By comparing mortality figures the following trend can be observed: up to the end of the 1990s the mortality rate in Germany was above, in France and the Netherlands significantly below, the average for the 15 EU member states (see Figure 1.2.7). Since then, the mortality rate from cerebrovascular disease has decreased to below the European average here in Germany, too.

#### Definition

A stroke is a sudden disturbance in the blood circulation of the brain which can lead to sudden paralyses or impediments to the senses, speech and consciousness. The term "stroke" covers various disease patterns labelled as cerebrovascular disease.

About 80 percent of all strokes originate in an ischaemia of the brain region with consequent cerebral infarction. The most important causes are sclerosis of the large arteries leading to the brain, blood clots transported from the heart (cardial embolism) and diseases of the small blood vessels in the brain itself (microangiopathy). In about 20 percent of cases the stroke is caused by cerebral haemorrhage.

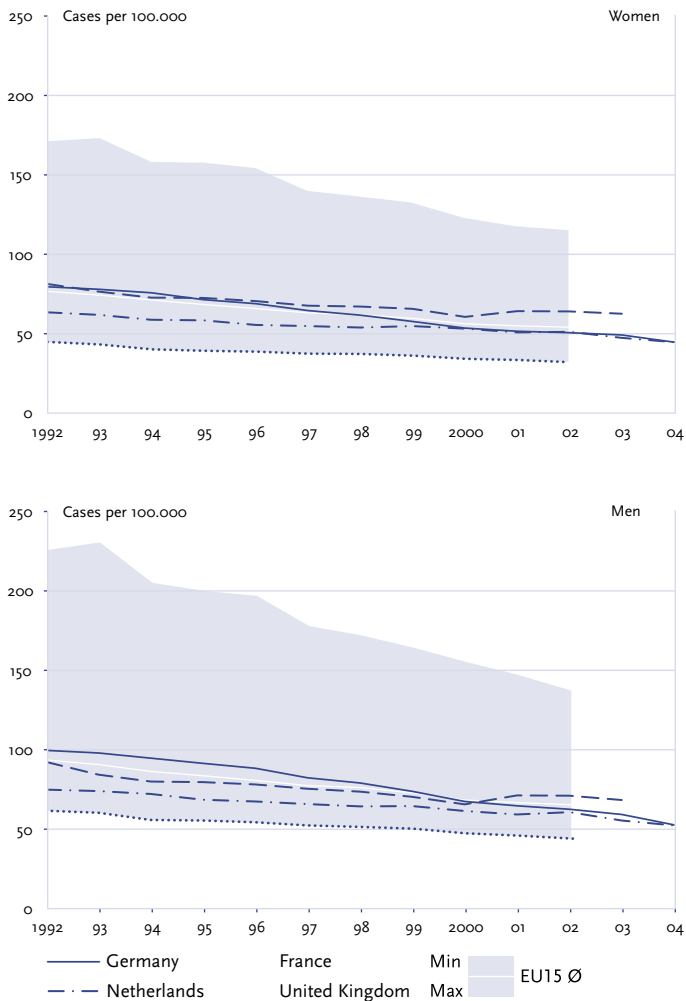
The onset of the disease often develops in three stages. In the first stage the arteries have already narrowed, but no symptoms are experienced. The second stage is marked by mild circulatory disturbance accompanied by transitory complaints (TIA). In the third stage, that of the acute stroke, the neurological damage remains after several days and does not disappear on its own.

#### Data basis

Apart from hospital diagnosis statistics and cause-of-death statistics, no reliable data on the incidence or prognosis of strokes was available before 1994. For this reason a stroke registry

was set up in Erlangen in 1994 (the Erlangen Stroke Registry) with the purpose of ascertaining rates of incidence and survival of stroke, as well as the resulting demand for medical care. The total population of Erlangen was chosen

as the subject of study. Since 2003 the Erlangen Stroke Registry has been part of the Project Competence Network on Stroke, which is promoted by the German Ministry for Education and Research.



**Figure 1.2.7:** Comparison of age-standardized mortality rates for cerebrovascular diseases per 100,00 inhabitants in European countries, by sex. Source: HFA Database (January 2006), WHO

**Strokes are a major cause of the need for nursing care among adults.** In the time immediately following a stroke, most patients have difficulty mastering everyday activities, such as the use of the toilet, walking, eating and drinking. Permanent neurological damage occurs in about 60 percent of those affected [41]. The fact is that a stroke is one of the main causes of the need for nursing care in adulthood.

A particularly intensive level of care and treatment can be given to patients in what are known as stroke units. These are centres with specially trained personnel and extensive technical facilities. There are 107 such special centres in Germany; they are listed on the website of the medical competence communication network ([www.kompetenznetz-schlaganfall.de](http://www.kompetenznetz-schlaganfall.de)). As shown in a recent study, patients treated in stroke units have a higher chance of survival and a better chance of leading an autonomous life again [42].

The Berlin Study on Acute Strokes (BASS), one of the research projects within the Competence Network on Stroke, recently analysed the state of care for stroke patients in four Berlin hospitals [41]. The first results of this study indicate that many of the patients reaching hospital too late had interpreted their symptoms wrongly, had a low level of education, had been living alone, or had failed to call the emergency services. But delays in treatment also occur in hospital, underlining the need of further training for physicians.

### 1.2.3 Mental health

#### ► Abstract

The importance of mental illnesses was underestimated for a long time, owing to a lack of reliable data. As recent surveys show, 15 percent of women and eight percent of men in a given year go through a period of depression. The most dreaded consequence of depression is suicide. One in seven of severely depressed patients commits suicide. What is more, depression is a frequent cause of inability to work.

Anxiety disorders are also widespread in Germany. In a given year, one woman in five and just under one man in ten experiences an anxiety disorder. This often has a severely negative affect on everyday living. It seems likely that to date only some of those affected have been correctly diagnosed and put onto an appropriate course of treatment.

#### 1.2.3.1 Depression

**Depression occurs frequently and reduces the quality of life of those affected.** Depression is one of the most common forms of mental illness worldwide, although its effects were underestimated for years. Studies from the 1990s show that family doctors and general practitioners often failed to recognize cases of depression [47], and in those cases where a correct diagnosis was made, the patients did not always receive appropriate treatment [48]. In recent years these problems have been receiving increasing attention.

According to data from the “Global Burden of Disease Study 2000” (GBD 2000), 3.2 percent of women and 1.9 percent of men were suffering from so-called unipolar depression at the time of the survey. (Unipolar depressions are characterized by depressive phases only; by contrast, bipolar depressions include manic phases.) When the analysis includes figures for a twelve-month period (period prevalence) and not only figures from the time of the survey (point prevalence), it can be seen that 9.5 per-

#### Definition

Depression is a mood disorder accompanied by sadness, dejection, apathy and a lack of energy and drive. This is regarded as an illness that needs to be treated if the symptoms continue without interruption for at least two weeks.

The distinction between depressive illness and normal, brief periods of low spirits – popularly also known as depression – lies in the duration, nature and intensity of the complaints. Depression is usually caused by several factors and is referred to as a multifactorial disorder. Biological, psychological and social components are all involved. The probability of occurrence of the illness is determined on the one hand by a person’s genetic and neurobiological background, and on the other by the emotional strain to which a person is subject in his or her life.

So-called vulnerability-stress models work on the assumption that depressive disorders arise through the interplay of a pre-existing disposition to depression and stressful life situations [46].

#### Data basis

Only since the 1990s have methodologically sound national and international studies made it possible to reliably estimate the extent of mental disorders.

For example, the Harvard School of Public Health carried out the “Global Burden of Disease Study 2000” [43] for the World Health

Organization. It found that about twelve percent of the population worldwide and twenty percent of the European population are burdened with psychic disorders [44].

In Germany the frequency and effects of mental disorders, as well as the situation with regard to medical care, were detailed for the first time in the National Health Interview and

cent of women and 5.8 percent of men had experienced an episode of depression at some time in the previous year.

In addition, the GBD 2000 shows that depression is accompanied by a considerable burden of disease. The burden of disease can be measured with a special indicator, the Disability-Adjusted Years of Life (DALYs). It refers to the number of years of life lost by a person, for example due to premature death caused by a specific illness or due to a condition of severe ill health.

According to the GBD 2000, of the diseases that cause the most DALYs around the world, unipolar depression ranks fourth for women and seventh for men.

Among 15- to 44-year-olds, unipolar depression ranks second among women and third in men [44].

In addition, the worldwide burden of disease caused by depressive disorders could rise further. The World Health Organization, WHO, estimates that in 2020 only ischaemic heart diseases (coronary artery calcification) will account for the loss of more potential years of life than depression.

The German National Health Interview and Examination Survey 1998 (BGS98) draws a detailed picture. The poll showed that 7.8 percent of women and 4.8 percent of men between the ages of 18 and 65 had suffered from depression in the previous four weeks. According to the data, women were more often affected than men. In the course of a year 15 percent of women and 8.1 percent of men experienced a depressive phase. The discrepancy between the four-week and 12-month prevalence rate is due to the fact that depression occurs episodically and there are complaint-free periods between periods of illness. This is why many people who are categorized as healthy when only a narrow time period is observed would be considered to be affected by depression if the observation period was longer. Depression can be said to occur in any age group. The mean age of onset is 32 for women and 33 for men [49]. As regards dysthymia, a milder form of mood disorder, the over-35-year-olds were at higher risk than people in younger age groups. Other depressive disorders occurred independent of age [50]. The BGS data show that depressions (as well as other mental disorders) occur more frequently in western than in eastern Germany [51].

The general practitioners’ study “Depression 2000” also examined the frequency of depression in Germany: of the

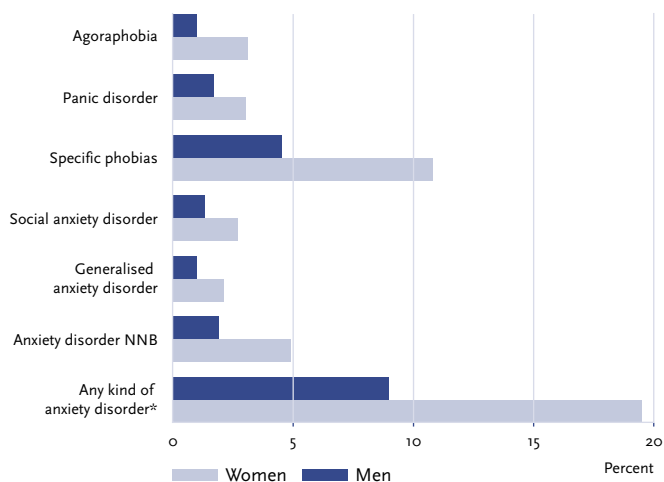
#### Definition

The Disability-Adjusted Years of Life (DALYs) refer to the total number of years lost to a person through premature death and the adverse affects of ill health.

There is a twofold consideration at the basis of this concept: firstly a person who dies prematurely compared to the population norm loses a part of his or her potential lifespan. Secondly, years spent in a condition of ill health should be deducted from life expectancy in proportion to the degree of the burden on health. The DALY figure, therefore, is a measure of the burden of disease and at the same time draws attention to deficits in healthcare.

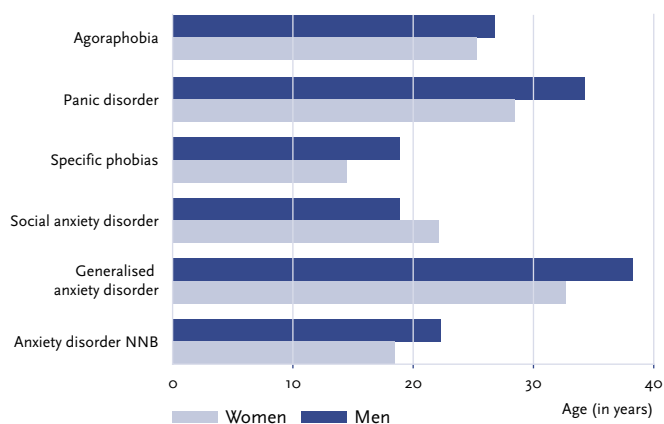
Examination Survey 1998 and a follow-up survey called “Mental Disorders” [45].

Three groups of disorders were included: affective disorders, which include depression and manic episodes; somatoform disorders, characterized by the occurrence of physical symptoms that have a psychological cause; and anxiety disorders.



\* without obsessive-compulsive disorders, post-traumatic stress disorder

**Figure 1.2.8:** 12-month prevalence of anxiety disorders (DMS-IV) for men and women; results given in weighted percent. Source: BGS98, special survey “Mental Disorders”, Max Planck Institute for Psychiatry



**Figure 1.2.9:** Average age (in years) at the onset of anxiety disorders for men and women. Source: BGS98, additional survey “Mental Disorders”, Max Planck Institute of Psychiatry

patients under medical treatment by a general practitioner on the reference day, 4.2 percent of the women and 3.1 percent of the men were found to be suffering from major depression [52].

**Three quarters of suicides are committed by men.** The most dreaded consequence of depression is suicide. Fifteen percent of all patients with severe depressive disorders commit suicide [53]. A total of 40 to 70 percent of all suicides can be attributed to depression [54].

According to information supplied by the German Federal Statistical Office, there were just under 11,000 suicides in Germany in 2004, 74 percent of which were committed by men. The real number of suicides may well be considerably higher than this, as unidentified suicides can be concealed as road accidents, cases involving death from drugs, or ill-defined or unknown causes of death [55].

There are no official data on attempted suicides. Since 1996, suicide rates have been recorded in the Würzburg area, the German region that participated in the WHO study “European Study on Parasuicide” [56]. The attempted suicides rates in the population over 15 years of age can be estimated on the basis of these data, which state that 108 men and 131 women per 100,000 attempted suicide in 2001 [57].

Figures on attempted suicides are also available from the Nuremberg pilot project “Nuremberg Alliance against Depression”. Attempted suicides were systematically monitored over a long period of time with the assistance of clinics, crisis intervention services and local doctors. The attempted suicide rate in 2000 was 115.5 per 100,000 inhabitants, with women accounting for almost 60 percent of the attempted suicides [58].

Quite apart from the higher risk of committing suicide, depression can adversely affect the course of many disorders, such as heart complaints [59]. Furthermore, depression is responsible for a growing number of cases of inability to work [60] (see also Section 1.3).

The GBD 2000 results led the World Health Organization to initiate an action programme to fight depressive disorders. The “mental health Global Action Programme” (mhGAP) was developed as a five-year programme to improve treatment for depressive persons [61].

In Germany the “Competence Network on Depression and Suicide” was founded to permanently strengthen cooperation and the exchange of knowledge among those involved in patient care [62]. The primary aims of the Competence Network are to reduce inadequacies in the recognition of depression by general practitioners, improve therapy and promote research into the causes of the disease.

Moreover, the “gesundheitsziele.de” initiative has made improving the situation of depressive persons a high-priority health-policy goal.



### 1.2.3.2 Anxiety disorders

#### **Women are more often affected by anxiety disorders than men.**

The German National Health Interview and Examination Survey 1998 (BGS98) provided the first representative figures on the occurrence of anxiety disorders in Germany. 14.2 percent of those asked in the 18–65 age group had suffered from an anxiety disorder during the previous year. Women were significantly more often affected than men (see Figure 1.2.8). There was no evidence to suggest that anxiety disorders might be more frequent in eastern than in western Germany [50].

**There are even some teenagers suffering from anxiety disorders.** Anxiety disorders begin on average between the second and fourth decade of life. As the BGS98 data show, nearly 60 percent of all anxiety disorders first occur before the twenty-first year of life. The lowest average age of first occurrence was observed for specific phobias, followed by social phobias. Agoraphobia and panic disorder occur much later. Generalized anxiety disorders record the highest average age of first occurrence (see Figure 1.2.9).

Little is known about how common anxiety disorders are among patients consulting a general practitioner. A World Health Organization study [47] revealed that in the two German study centres (Berlin and Mainz), patients suffering from generalized anxiety disorders in particular often visited their general practitioner. On the reference day more than seven percent of the patients diagnosed were found to have a generalized anxiety disorder, making it (after depression) the second most common of all mental disorders to be found in general practices. The frequency of panic disorders among general practitioners' patients in the study was two percent. A recent study in German GP's practices (GAD-P-Study) [63] confirmed that generalized anxiety disorder is the most common anxiety disorder treated by family doctors. On a given day, it was diagnosed in 5.3 percent of all randomly selected patients visiting the doctor (4.1 percent of men, 6.3 percent of women). In a third of the cases the anxiety disorder was accompanied by severe ongoing depression.

**Only a small number of the patients with anxiety disorders were treated correctly.** The GAD-P study also showed that patients with generalized anxiety disorders, regardless of their physical state of health, had paid an average of 11.2 visits to their doctor in the preceding twelve months, which classifies them as "high utilizers" of the healthcare system.

Furthermore, the GAD-P study revealed considerable deficiencies in care provision. In contrast to depressive disorders, which were diagnosed correctly in 64.3 percent of cases, general practitioners correctly diagnosed only 34.4 percent of the

patients suffering from a generalized anxiety disorder. Corresponding to the low detection rate, less than ten percent of those affected received appropriate therapy or were referred to a consultant.

To this day there are no data differentiating between this and other forms of anxiety disorder in Germany.

► Comprehensive Information on **anxiety disorders** can be found in booklet 21 of the Federal Health Reporting's series [64].

#### Definition

Whilst anxiety and fear clearly have a role to play in the natural order of human life and serve as a warning system against danger, a disproportionately long or causeless anxiety state is characterized as an anxiety disorder. This includes panic disorder, generalized anxiety disorder, agoraphobia, social anxiety disorder, specific (isolated) phobias as well as other phobic disorders. To date, only rudimentary explanations have been given as to the causes of anxiety disorders.

As in the case of depression, psychosocial, psychological, genetic and neurobiological factors are suspected of playing a part. Generally speaking, an anxiety disorder is regarded as an imbalance in the control of the normal anxiety-stress (fight/flight) mechanism. Avoidance behaviour, which reinforces reactions of anxiety and fear, is typical of anxiety disorders and can lead to an increasingly severe, chronic course of the disease.

Age Group	Jorm et al. (1987)	Hofman et al. (1991)	Ritchie & Kildea (1995)	Lobo et al. (2000)	
				Men	Women
65–69	1.4	1.4	1.5	1.6	1.0
70–74	2.8	4.1	3.5	2.9	3.1
75–79	5.6	5.7	7.3	5.6	6.0
80–84	10.5	13.0	13.4	11.0	12.6
85–89	20.8	21.6	22.2	12.8	20.2
90–94	38.6	32.2	33.0	22.1	30.8
95+		34.7	44.8		
<b>65 and older*</b>	<b>6.5</b>	<b>6.9</b>	<b>7.3</b>	<b>4.5</b>	<b>7.3</b>

**Table 1.2.3:** Age specific prevalence rate (in percent) according to meta-analyses of dementia cases. Source: Bickel [67]

Age Group	Alzheimer's Dementia				Vascular Dementia	
	Lobo et al. (2000)		Hy und Keller (2000)		Lobo et al. (2000)	
	Men	Women	Men	Women	Men	Women
65–69	0.6	0.7	0.7	1.0	0.5	0.1
70–74	1.5	2.3	1.5	2.1	0.8	0.6
75–79	1.8	4.3	3.1	4.5	1.9	0.9
80–84	6.3	8.4	6.4	9.0	2.4	2.3
85–89	8.8	14.2	12.8	17.4	2.4	3.5
90–94	17.6	23.6	23.7	31.0	3.6	5.8
95+			39.8	48.9		
<b>65 and older*</b>	<b>2.3</b>	<b>5.2</b>	<b>3.0</b>	<b>6.2</b>	<b>1.2</b>	<b>1.3</b>

\* Total rate for over 65's with standardisation of age structure of the population of the elderly in Germany at the end of 2002

**Table 1.2.4:** Age specific prevalence (as a percentage) of Alzheimer's dementia and vascular dementia according to meta-analyses

Year	Dementia Cases
2000	935,000
2010	1,165,000
2020	1,415,000
2030	1,690,000
2040	1,920,000
2050	2,290,000

**Table 1.2.5:** Changes in the number of dementia sufferers (65 and older) in Germany between 2000 and 2050 with unchanged age specific prevalence rates. Source: Bickel [67]; basis of estimation: prevalence rates according to Bickel [69] and population level according to the Federal Statistical Office [68]

### 1.2.4 Dementia

#### ► Abstract

**There are about a million people living with dementia in Germany. While under two percent of 65- to 69-year-olds are affected, the frequency rises to more than 30 percent for the over-90-year-olds. Owing to demographic ageing, a marked rise in the numbers of men and women suffering from dementia can be expected in the future. The majority of people with dementia live in private households; most are looked after by female relatives.**

**Dementia becomes more frequent with advancing years.** Dementias are among the most frequent disorders with the most serious consequences among people of advanced age. About a million people are currently suffering from dementia in Germany. There are close to 200,000 new cases every year. The frequency of dementia disorders increases with advancing age. They occur among about 1.5 percent of 65- to 69-year-olds, doubling in every five-year age group thereafter, and affect over 30 percent of persons over 90 years of age (see Figure 1.2.3). Alzheimer's disease, which accounts for about a third of all dementia patients, is the most common form.

**Two out of three people suffering from dementia are women.** At least two thirds of all dementia sufferers are women. The principle reason for this is a longer life expectancy of women compared to men, which increases their risk of developing dementia [67]. In addition, women seem to be able to survive longer with the disease than men, a fact that also contributes to a higher prevalence. The differences between men and women are especially marked among the extremely elderly. If a distinction is made between Alzheimer's disease and vascular dementia (see Figure 1.2.4), it can be seen that the marked difference between the sexes is principally a reflection of the higher prevalence rate of Alzheimer's disease. In relation to all persons aged over 65 years, the prevalence of Alzheimer's disease is twice as high among women over 65 as among men over 65, whereas the difference between the sexes in rates of vascular dementia is small.

**The number of those suffering from dementia disorders could double by 2050.** If there is no breakthrough in dementia prevention and therapy, the number of dementia sufferers can be expected to rise as a result of the growing proportion of elderly people in the population. In Germany about 900,000 people over 65 years of age were suffering from dementia in 2000 [67]. Based on the German Federal Statistical Office's tenth popula-

tion forecast [68], the figure could rise to 1.4 million by 2020 and almost 2.3 million by 2050.

**Caring for dementia sufferers is a task generally undertaken by relatives.** Although knowledge of the options for the medical, psychological and social therapeutic treatment of dementia disorders has advanced considerably in recent years, it has not yet proved possible to halt the process of the disease. This places heavy demands on the care system and those looking after a relative with dementia.

The great majority of dementia sufferers live in private households.

A large proportion of those who are in need of care and live at home have a dementia disorder, and the proportion whose condition is worsening and who require an increasing level of nursing care is rising rapidly. The people, mostly women, looking after a relative with dementia at home, provide on average six to ten unpaid hours of care a day. Looking after a person with a dementia disorder can put a heavy burden on the attendant, resulting in depressive moods, psychosomatic problems, disorders of the muscular-skeletal system or the use of psychotropic drugs. The excessive burden of care is often the reason why relatives with dementia are put into nursing homes [70].

The proportion of residents of nursing and old people's homes suffering from dementia has continually grown over the last few decades. At present more than 60 percent of residents are affected by dementia.

An estimated total of 400,000 persons with dementia are looked after in old people's homes and nursing homes [67].

► Comprehensive Information on **senile dementia** can be found in booklet 28 of the Federal Health Reporting's series [70].

#### Definition

According to the International Classification of Diseases (ICD-10) [65], dementia is a disease syndrome resulting in permanent damage to the higher functions of the cerebral cortex. In particular, memory, thinking capacity, orientation, the ability to learn, speech and the power of judgement can be adversely affected. Cognitive reduction is usually accompanied by a loss of emotional control and motivation as well as an alteration in social behaviour.

The generic term "dementia" includes a range of disease patterns with different causes [66]: degenerative dementias (e.g. dementia with Alzheimer's disease), vascular dementias (e.g. dementia after multiple cerebral infarctions), dementias with nutritionally-toxic or metabolic causes (e.g. alcohol dementia, dementia caused by vitamin insufficiency disorders), dementias characterized by inflammation or infection (e.g. dementia accompanying Creutzfeldt-Jakob disease, AIDS, neurosyphilis), and dementias caused by craniocerebral injuries.

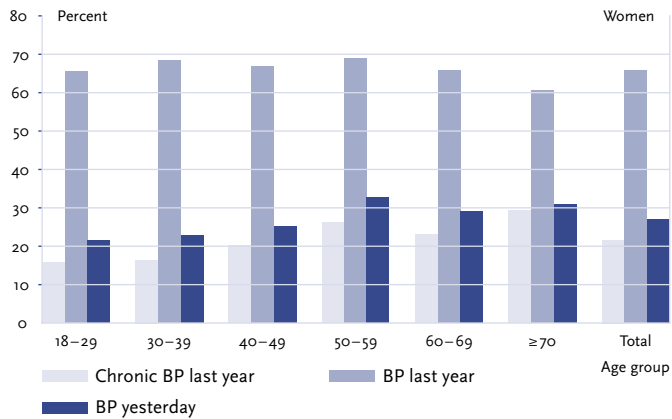


Figure 1.2.10: Prevalence of back pains (BP) and chronic back pains among women in Germany. Source: Telephone Health Survey 2003, RKI

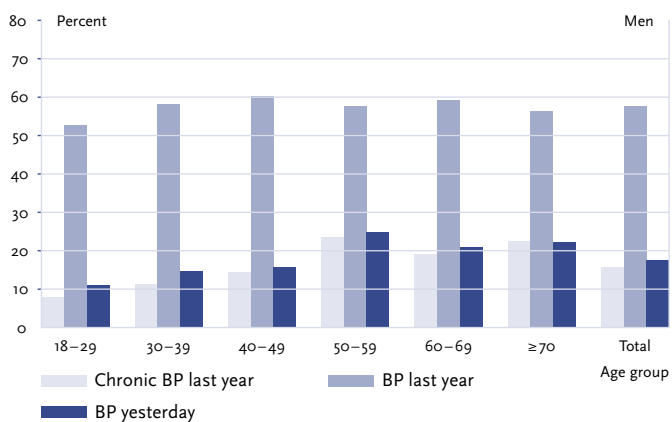


Figure 1.2.11: Prevalence of back pains (BP) and chronic back pains among men in Germany. Source: Telephone Health Survey 2003, RKI

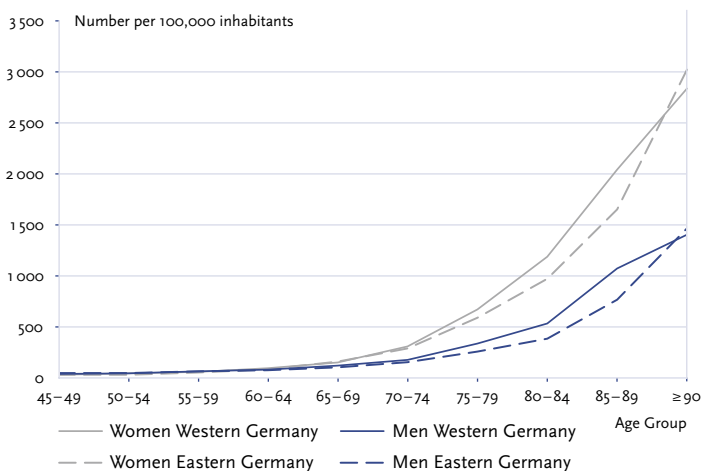


Figure 1.2.12: Estimated age- and sex-specific 5-year risk of hip fractures (ICD-9: 820) in Western Germany and Eastern Germany in 1996. Source: Wildner [71]

## 1.2.5 Muscular and skeletal disorders

### ► Abstract

Muscular and skeletal disorders are among the most frequent and costly diseases in Germany. In terms of treatment cost, they rank third in all groups of illnesses. In addition, they are a financial drain on the economy. Muscular and skeletal disorders together cause the most days of work incapacity: for men they are the most common and for women the second most common cause of early retirement due to ill health.

In Germany, 22 percent of women and 15 percent of men suffer from chronic back pain. To date, there are no reliable figures on the frequency of osteoporosis and osteoarthritis in Germany. It is evident, however, that both disorders are widely prevalent. Osteoporosis is the cause of at least one spinal fracture for 7.6 percent of women and 4.9 percent of men between the ages of 50 and 79. X-rays show that in 20 to 40 percent of the population there are indications of joint degeneration which will lead to osteoarthritis accompanied by pain and constriction of movement for some of those affected.

#### 1.2.5.1 Back pain

*One woman in five and one man in seven suffers from chronic back pain.* According to data from the National Health Interview and Examination Survey 1988, back pain is the most common form of pain among men and women of all age groups, even ahead of headaches and neck and shoulder pain: 39 percent of the women and 31 percent of the men confirmed that they had suffered from back pain in the preceding seven days. For about half the women affected and 80 percent of the men affected, back pain had constituted the most intensive pains in the week before being questioned. Data from the national telephone health survey carried out in 2003 point in the same direction. According to this survey, in the year preceding the survey 22 percent of women and 15 percent of men had suffered from chronic back pain that lasted for at least three months and could be felt daily or almost daily (see Figures 1.2.10 and 1.2.11).

Back pain becomes more frequent with advancing years and typically reaches its maximum prevalence in a person's fifties and sixties. They are, however, a significant problem for all age groups. Women in all age groups noted more back pain than men, a gender difference which was also noted for other kinds of pain. Furthermore, on average the pain was more intense and of longer duration for women than for men. The reasons for the gender difference have not been explained conclusively. It could be that pain-risk factors are more frequent among women, and that there are differences in the way in which men and women experience, deal with and recall pain.

**Psychic and social problems are a contributory factor to back pain.** Many surveys show that not all population groups are equally affected by back pain. As is to be expected, people with specific bone and joint disorders such as rheumatism or osteoarthritis suffer from back pain more frequently. In most cases, however, where back pain cannot be attributed to a specific disease, the term "unspecific back pain" is applied.

How it arises and develops into a chronic ailment remains largely unclear, but a series of risk constellations have been observed which make it possible to identify vulnerable population groups.

People with a lower socio-economic status (especially as measured by educational levels, but also by professional position and income) have back pain more frequently than those with a higher socio-economic status. Furthermore, back pain

interacts with depressive symptoms and other indicators of psychic health.

In the 2003 telephone health survey, twice as many men and women who left school without a higher education entrance qualification ("Abitur"), or without any school-leaving certificate at all, admitted to chronic back pain than participants who had passed the Abitur. Similarly, among those questioned, those who admitted to depression were twice as likely to have had back pain as those without depression. Further risk factors are work stress, dissatisfaction with work, and lifestyle factors such as smoking and overweight. The link to back pain is probably only an indirect one and much more the expression of generally deleterious health behaviour.

**Back pain is a financial burden on the economy.** The medical and economic costs of back pain are the same as those caused by headaches, heart disease, depression or diabetes. Most of the costs of back pain are caused by a small percentage of those chronically affected. In contrast to other diseases, most of the cost of back pain is caused by indirect effects and not by the direct costs of therapy. According to international estimates, about 85 percent of the costs are a result of the fall in productivity caused by the loss of working hours; about 15 percent are the costs of medical treatment.

According to the Federal Statistical Office's calculation of the cost of illness, nearly €8.4 billion was spent on the treatment of spinal and back disorders in 2002 (ICD-10: M45–M54), about four percent of the direct costs of all diseases. The total costs of therapy for back disorders may well be higher than this, as there are other diagnoses involved where these costs play a part, such as spinal column deformations (ICD-10: M40–M43) or vertebral body fractures resulting from osteoporosis (ICD-10: M80).

The magnitude of the indirect costs becomes evident by looking at the figures for work incapacity. Spinal-column and back disorders (ICD-10: M40–M54) were the cause of 33,785 lost working days per 10,000 members of the German local health insurance fund (AOK) in 2002. This averages out at three days per member and constitutes nearly 18 percent of all working days lost through inability to work.

It cannot be reliably ascertained from the data available in Germany whether back pain is increasing among the population. Some statistics provided by the social insurance carriers suggest that over the last two decades there have been various upward and downward trends in hospital admissions and rehabilitation treatments, as well as in the number of cases of inability to work and early retirement. However, caution is called for when comparing statistics from different years, because in 2000 a conversion took place from the ninth to the tenth version of the International Classification of Diseases (ICD).

The data from social insurance benefit payments paint a somewhat varied picture, but one that does not suggest that back pain has reached epidemic proportions.

To date, recurring international surveys have not shown any real increase in cases of back pain either, although the issue continues to be of major importance for the German healthcare system and the health of the people.

### 1.2.5.2 Osteoporosis

**Women suffer more often from osteoporosis than men.** About 1,300,000 osteoporosis-induced fractures of the neck of the femur [71] occur in Germany every year. Women are two to three times more at risk than men of the same age: 72 percent of all fractures of the femur neck are incurred by women [72]. This is partly because women have a longer life expectancy, since the number of fractures of the femur neck rises exponentially after 75 years of age (see Figure 1.2.12).

The number of fractures of the femur neck depends not only on the frequency of osteoporosis but also on the increased risk of falling which accompanies more advanced age. This applies less to spinal column fractures, which is why they are considered to be a more reliable indicator of osteoporosis [73]; but the recording of spinal column fractures is difficult. Mass radiography is required in order to estimate frequency. Relevant data for Germany come from the European Vertebral Osteoporosis Study (EVOS), according to which osteoporosis-related spinal fractures are widely prevalent. In the EVOS study 7.6 percent of women and 4.9 percent of men between the ages of 50 and 79 were found to have had at least one osteoporosis-induced vertebral compression fracture [74].

In the prospective part of the study (EPOS) it could be seen that the incidence rate of vertebral fractures rises exponentially with age. Vertebral fractures among the over 60s were about twice as frequent in women as they were in men. The number of vertebral fractures heavily outweighed the number of femoral neck fractures among the 50- to 79-year-olds in the study group. This can be explained by the fact that hip fractures become markedly more frequent over the age of 80 [75].

**High age means high risk.** Generally speaking, the incidence and prevalence of fragility fractures increases for both men and women over 60 [76] and rises exponentially from the age of 75. The reasons for this are to be found in the declining tensile strength of the bones, the increasing likelihood of falling, and various other risk factors [77, 78]. The most important risk factors in osteoporosis are advanced age (> 60 years), a very low body weight (Body Mass Index < 20 kg/m<sup>2</sup>), considerable loss of weight, very restricted mobility and alcohol abuse [73, 79]. In addition, a very low calcium diet, a family predisposition to osteoporosis, cigarette consumption and, for women, a late menarche and early menopause are predisposing factors [80]. In addition, a vitamin D deficiency in advanced age seems to increase the risk of both fractures and falling [81, 82].

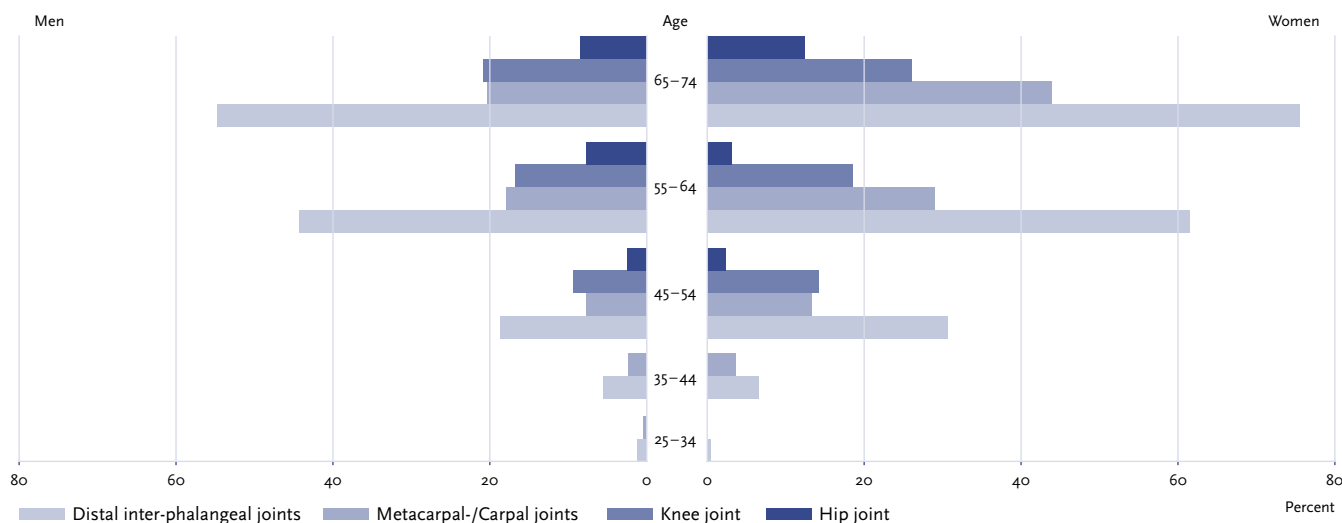
**There are more fractures due to osteoporosis in northern than in southern Europe.** The incidence is higher in western than in

#### Data basis

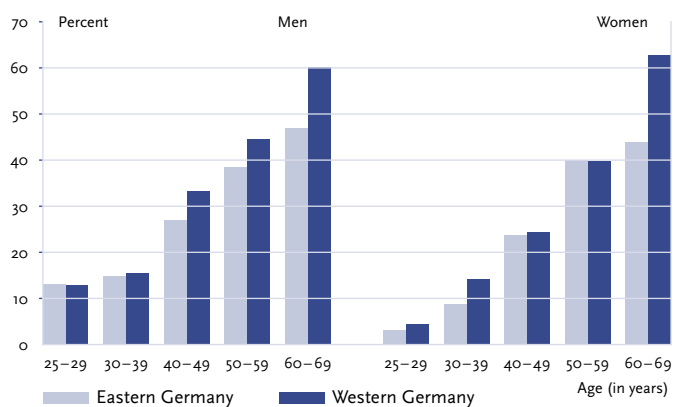
To date, there are no reliable data in Germany detailing the prevalence of osteoporosis. Estimates of frequency have to be made indirectly on the basis of the number of fractures. It is not possible by this method to determine the exact total number of fractures that have been caused

by osteoporosis. Epidemiological studies have nevertheless identified various so-called index fractures, which are typical of osteoporosis and permit, at least in principle, estimations of frequency. These are mostly fractures of the spinal column, the peripheral radius close to the wrist, the neck, the thigh bone, and other sections of

the femur close to the hip joint. Reliable data on the number of hip fractures, which are nearly always treated in hospital, are available. Other osteoporosis-induced index fractures are much less reliably recorded, owing to a lack of specific symptoms and because making an accurate diagnosis is not always easy.



**Figure 1.2.13:** Prevalence of selected radiological verifiable forms of arthrosis in the Netherlands. Source: Van Saase [86]



**Figure 1.2.14:** Life-time prevalence of arthrosis 1998 (self reported). Source: BGSg8, RKI

eastern Germany (see Figure 1.2.12). The general trend of incidence is upward, especially in eastern Germany [71]. A possible reason for this development may be what are known as the cohort effects. This means that people who were born in a specific birth cohort are especially affected by osteoporosis risk factors.

Compared internationally, the risk of fracture as a result of osteoporosis varies considerably. Germany is in the middle of the table behind the Scandinavian countries and the USA, where the rate of fractures is higher. There is a clear north-south divide within Europe, with more fractures in the northern countries than in the southern ones [83, 84]. Genetic factors and a different life expectancy have both been discussed as a possible cause of the difference.

**Sport and a healthy diet help to prevent the onset of osteoporosis.** The growing number of older people in Germany and the indications of a future rise in the rate of fractures is making the prevention of osteoporosis ever more important. For example, a sufficient intake of calcium and vitamin D and physical activity are important prophylactic measures (primary prevention). Early detection and treatment for high-risk groups (secondary prevention) can at least partially prevent the incidence of fractures where osteoporosis exists. If a fragility fracture does happen, it is important in treatment to take preventive measures against further fractures and, if possible, to maintain the patient's mobility and independence (tertiary prevention).

### 1.2.5.3 Osteoarthritis

**Painful joints in themselves do not constitute osteoarthritis.** Osteoarthritis can be identified by a clinical examination in the course of which, for example, characteristic complaints and pains can be identified during movement of the joints, and by X-rays of the joints. A report of pain in the joints is not sufficient grounds for a diagnosis of osteoarthritis since other disorders can cause similar complaints, for example those involving inflammation of the joints (arthritis, articular rheumatism) or meniscus damage.

Even a conspicuous X-ray finding does not necessarily signify osteoarthritis in need of treatment. In 20–40 percent of X-rays of people over the age of 60 there are indications of degenerative joint diseases (arthrosis or osteoarthrosis). Only around a third of those affected complain of pain caused by these conditions [85].

**The risk of osteoarthritis increases with advancing years.** Men and women are equally affected by osteoarthritis and in both sexes the frequency of the disease increases with age. In view of the demographic changes that are anticipated in the coming years in Germany, the demand for care can be expected to go on rising. Despite the variety of methods of treatment, no medication is available today that is really capable of halting the progress of the disease.

No representative population studies exist for Germany on the frequency of osteoarthritis with diagnoses validated by data from radiographs.

#### Definition

Osteoporosis is a disease characterized by increased bone fragility. Its rate of occurrence rises with age. Women are more often affected than men. Osteoporosis causes no complaints for many years before fractures occur for no apparent reason, or just in the course of normal day-to-day stress. These so-called fragility fractures can lead to a loss of quality of life and independence – to the extent of a degree of invalidity that requires nursing care – and a shortened lifespan.

The most representative results that could be used for the German population are those of a major study in the Netherlands [86]: radiographs of the spinal column and several joints were taken from a random selection of 6,585 people. The results showed that the prevalence of osteoarthritis increases dramatically with age (see Figure 1.2.13). In the Dutch study (as also in other studies) no data were produced on the average frequency of osteoarthritis because this would underestimate the magnitude of the challenge in people of advanced years.

**Knee-joint osteoarthritis is the most common form of the disease.** According to new studies from abroad [87], five to 15 percent of people over 55 years of age show signs of arthritis both in terms of objective radiological confirmations of the wearing down of the joints and subjectively with complaints of pain in the knee joints.

In European studies reporting on cases of osteoarthritis on the basis of clinical surveys but without the radiological evidence [88–90], knee-joint osteoarthritis is prevalent in ten percent and hip osteoarthritis in about five percent of the people. With all due reservations on the reliability and relevance of the data, this would mean for Germany that ten to 20 percent of the population in their sixties have radiographs indicating hip or knee-joint osteoarthritis and that half of these are suffering from pains caused by the disease.

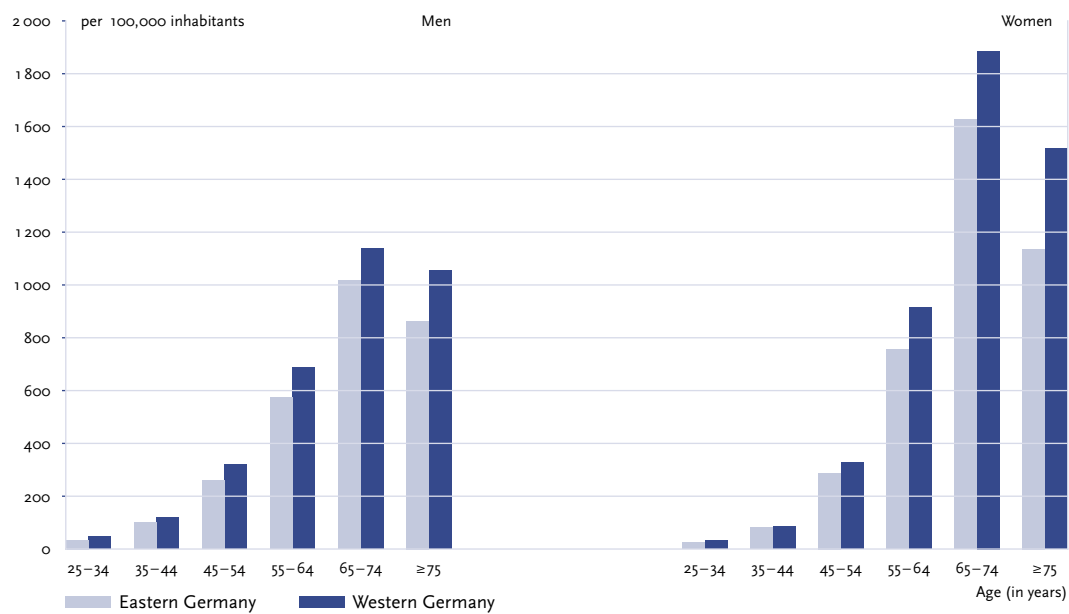
The German National Health Interview and Examination Survey 1998 (BGS98) also included questions about osteoarthritis: 31 percent of the 1 to 78-year-old men and women in the survey recalled that “joint erosion, osteoarthritis of the hip or knee joints or the spinal column” had been diagnosed by a physician at one time in the past (see Figure 1.2.14).

It should be born in mind that in this survey there were neither records of a clinical examination nor radiographs, making it difficult to distinguish systematically between osteoarthritis and other disorders with joint-related complaints (for example arthritis or meniscus injury).

This becomes apparent in a telephone survey conducted in Bavaria in 1999/2000, where people were again questioned as to whether they had been diagnosed with osteoarthritis, although the question was formulated differently [91]. The term osteoarthritis was primarily used, and a term that would fit better to describe arthrosis, namely “degeneration of the joints”, was given in response to requests for clarification from respondents. The recorded prevalence of 17 percent for osteoarthritis which emerged from this survey was considerably lower than in the BGS98. But even if neither survey can be relied on

#### Definition

The term osteoarthritis covers a heterogeneous group of disorders of the joints, involving damage to the articular cartilage, the adjoining bones, the ligaments, the articular capsule and synovial membrane. Osteoarthritis becomes more frequent with advancing years. The disease has various causes, some of which are still unknown. Damage to the joints, acquired or congenital misalignment, metabolic diseases, genetic predisposition and a mechanical straining of the joints facilitate the onset of the disease. First it leads to damage to and a deterioration of articular cartilage, in the long-term also to the destruction of the soft parts (synovial membrane, articular capsule and ligaments) as well as the adjoining bones. The parts of the body particularly vulnerable to osteoarthritis are the knees (gonarthrosis), hips (coxarthrosis), the spinal column and the hands. They lead to pains in the joints, which usually persist over years and impede movement. Not only does this lead to difficulties in carrying out day-to-day tasks, it also affects social life and leads to a loss of quality of life.



**Figure 1.2.15:** In-patient treatment for arthrosis (ICD-10: M15 – 19) in 2002.  
Source: Hospital diagnosis statistics, Federal Statistical Office [72]

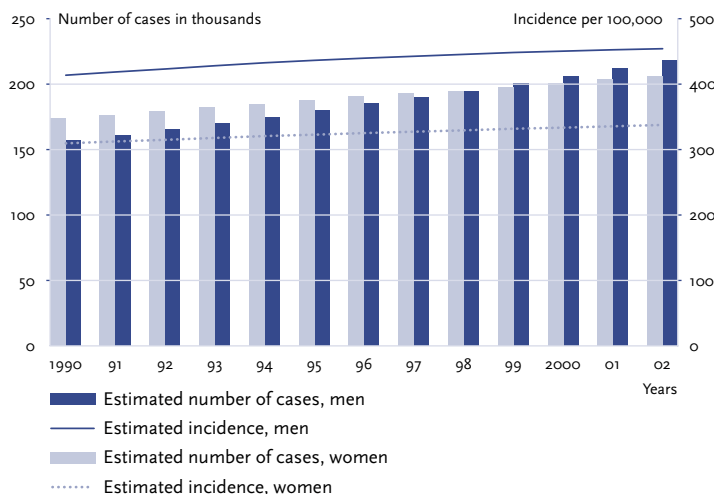


to give a wholly accurate picture of the prevalence of osteoarthritis, they nevertheless constitute enough evidence to show the importance of the disease.

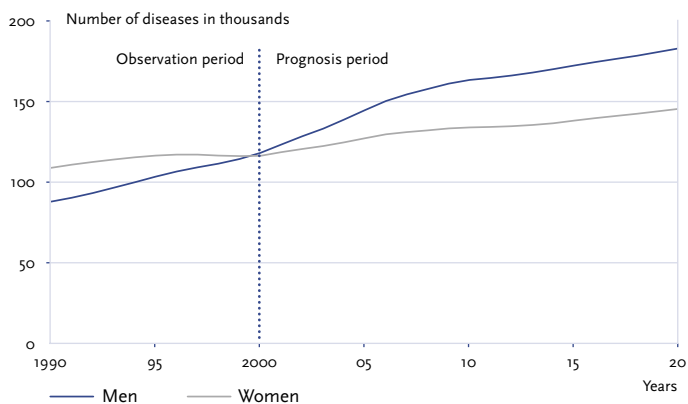
***Osteoarthritis patients are among the most frequent clients of the healthcare system.*** Osteoarthritis is an extremely common cause of both inpatient and ambulatory treatment. According to data from the Central Research Institute on Ambulatory Health Care in Germany, knee and hip osteoarthritis are among the ten most common individual diagnoses made in orthopaedic surgeries. Osteoarthritis complaints are a common reason for visits to general practitioners, surgeons and family internists.

Osteoarthritis is less often treated in hospital and when it is, this is usually to implant an artificial joint. Nevertheless, hip and knee osteoarthritis are among the thirty most frequent diagnoses in hospital. In 2002 there were a total of 336,833 inpatient treatments in which osteoarthritis was the principle diagnosed disorder (ICD-10: M15–M19). 63 percent of the patients were women. The rate of admission for inpatient treatments rises significantly with age in both men and women and is higher in eastern than in western Germany (see Figure 1.2.15).

Corresponding to the high utilization of ambulatory and inpatient services, osteoarthritis causes great costs. The Federal Statistical Office calculates that about EUR 7 million were spent on treating osteoarthritis in 2002 (ICD-10: M15–M19). This is close to 30 percent of the direct costs incurred by the entire range of muscular and skeletal disorders. In addition a considerable proportion of lost workdays, early retirements and rehabilitation measures are caused by degenerative joint diseases, making them one of the most important chronic diseases of all in terms of the effects on the German economy.



**Figure 1.2.16:** Estimated annual number and incidence of new cases of cancer in Germany (ICD-10: C00 – C97 excluding C44). Source: Central Cancer Documentation Centre, RKI



**Figure 1.2.17:** Estimated number of new incidents of cancer among persons aged over 65 in Germany, if the risk of cancer is to remain unchanged since the year 2000 (ICD-10: C00 – C97 excluding C44). Source: Central Cancer Documentation Centre, RKI (Data basis: [68] Variant 1)

## 1.2.6 Cancer

### ► Abstract

After cardiovascular diseases, cancer is the second most frequent cause of death in men and women in Germany. Many potential years of life are lost to malignant neoplasms, because those affected often die before reaching the age of 70. Lung cancer is of particular importance among men; for women it is breast cancer. In advanced years prostate cancer is the predominant form of cancer among men, while for women it is bowel cancer. The trends in cancer vary according to location and gender. For example, the incidence rate of lung cancer has been falling in men since 1990, yet the rate has been rising in women under 50. This has been attributed mainly to the increased consumption of cigarettes by women – cigarette consumption being the most important risk factor in lung cancer. Bowel cancer is the second most common type of cancer in both men and women. In the second half of the 1990s the incidence rate of the disease remained practically unchanged in both sexes, yet the mortality rates have been falling since the early 1990s in men and the early 1980s in women. The bowel cancer rate depends on dietary habits, among other factors. The early detection of bowel cancer is part of the statutory cancer screening programme.

The mortality rates for breast cancer in women fell in the 1990s, whilst incidence rose. The introduction of a quality-assured nationwide mammography screening scheme aims to reduce the mortality rate further.

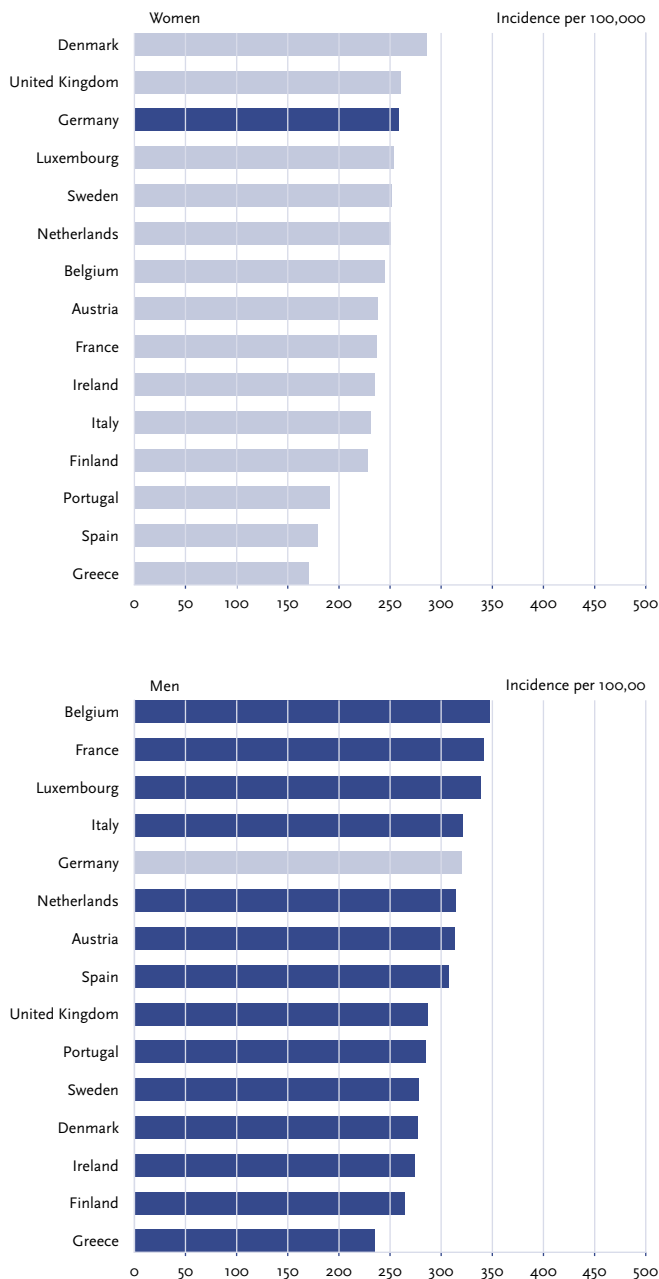
All in all, the chances of surviving cancer are better now than they were 20 years ago. Comparing the survival rates of people diagnosed with cancer between 1985 and 1988 with those diagnosed between 1994 and 1998, it can be seen that the five-year survival rate has risen for nearly all malignant neoplasms. This explains falling cancer mortality rates for women since the early 1970s and for men since the early 1980s, while the cancer incidence rate has been rising.

**For Germans the risk of developing cancer continued to rise in the 1990s.** This is shown by the current (2006) figures for cancer incidence estimated by the Central Cancer Surveillance Programme at the Robert Koch Institute using data from the population-based cancer registries in the federal states (see Figure 1.2.16).

Between 1990 and 2002 the annual age-standardized incidence rate in women rose from 307 to 335 cases of cancer per 100,000 persons. The figure for men rose from 411 to 452 cases per 100,000 persons. This corresponds to an average growth of about 0.8 per year, slightly more for women, slightly less for men.

The figures for cancer mortality paint a very favourable picture. The age-standardized mortality rate in women has been declining since the 1970s, the rate for men since the end of the 1980s.

The decline of cancer mortality accompanied by increasing incidence is largely due to early detection and earlier treatment, which together have led to a continuous improvement in cancer survival rates. At the same time the number of cancer cases occurring each year is rising as a result of the demographic ageing process. Between 1990 and 2002 the annual number of cancer cases in men rose by 39 percent (3.3 percent a year) and in women by 19 percent (1.5 percent a year). According to estimates of the Robert Koch Institute, the number of cancer cases in 2002 was about 218,000 in men and 206,000 in women.



**Figure 1.2.18:** Age-standardized incidence of cancer in the European Union 2002 (World Standard). Source: GLOBOCAN-Estimate 2002, RKI estimate for Germany 2002. Source: GEKID, RKI: Cancer in Germany [94]

**Breast cancer and prostate cancer rank joint first in the cancer statistics.** The most frequent cancer in men is prostate cancer with almost 49,000 new cases in 2002. Bowel cancer was in second place with about 35,500 new cases. Lung cancer, which used to be in first position, was the cause of 32,500 new cases in 2002. The change in the order of cancer cases and the increase in prostate cancer incidence follows the introduction of the so-called PSA tests. Cancer of the prostate gland can be detected at an early stage with this blood test, although it has not yet been proven that this improves survival and reduces mortality rates. It is possible that the PSA tests bring to light relatively harmless tumours that would not have been fatal. Owing to doubts about its usefulness, the PSA test is not a fixed part of the guidelines for the early detection of cancer and is not included in the statutory cancer screening programme.

The most frequent cancer among women remains breast cancer with about 55,000 new cases in 2002. The age-standardized incidence rate for breast cancer has been rising since the 1980s, while the mortality rate has been falling since the mid-1990s. Between 1980 and 2002 both the estimated number of cases and the incidence rate of malignant skin melanomas increased markedly in both sexes. The annual number of bowel cancer cases also rose markedly, as did the incidence rate to a minor extent. Rising incidence and constant or even decreasing mortality are explained by the greater efforts being made towards early diagnoses and in part by a greater motivation for doctors to register cases covered by the statutory cancer screening programme.

**The number of new cases of cancer will continue to rise significantly up to 2020.** Owing to the growing number of older people, a significant upturn in total cancer cases can be expected in the coming decades. This is the result of a conservative calculation based on the tenth population forecast of the Federal Statistical Office and constant (instead of further rising) age-specific cancer incidence rates in 2000 (see Figure 1.2.17). According to these projections, by 2020 the number of new cancer cases among men over 65 will have risen by at least 50 percent and among women over 65 by at least 25 percent.

**Greek men and women are particularly unlikely to develop cancer.** The age-standardized incidence for German men and women was above the European average (EU-15) (see Figure 1.2.18). Belgians had the highest incidence rate among men, followed by the French, Luxembourgers, Italians and Germans. The lowest rates were recorded for Greek, Finnish and Irish men.

Danish and British women have an even higher cancer incidence rate than German women, whilst Greek, Spanish and Portuguese women are the least likely of the EU nationalities to be affected by cancer.

There tends to be a north-south gap in Europe among women, with high incidence rates in the north and lower rates in the south. The picture is less clear-cut for men, with Finnish and Irish men having low incidence rates and Italian men relatively high ones.

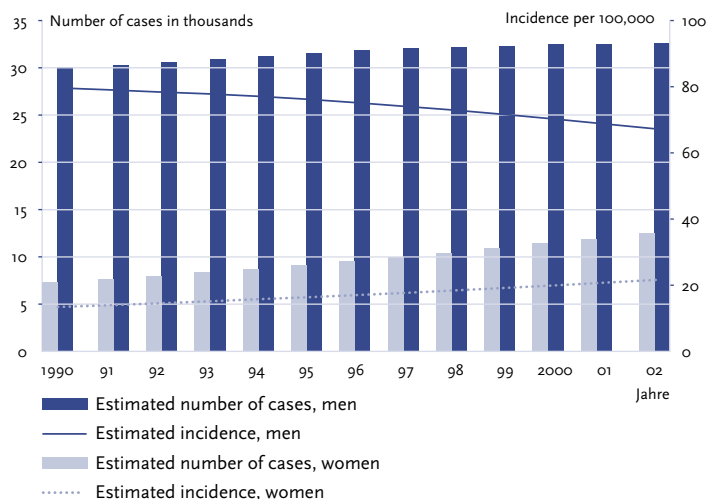
**New methods for early cancer detection raise the number of cancer cases diagnosed.** The use of new early-detection methods can lead to a greater awareness of cancer. Therefore, rising inci-

### New methods for early cancer detection raise the number of cancer cases diagnosed.

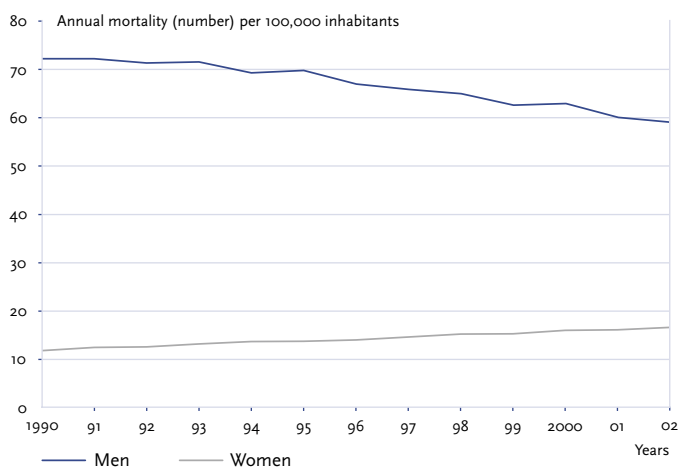
The use of new early-detection methods can lead to a greater awareness of cancer. Therefore, rising incidence rates do not necessarily reflect

an increased cancer risk. They may instead just be pointing to an increased detection rate of the preclinical and early stages of certain types of cancer. The purpose of the early detection of cancer is not the earliest possible diagnosis as

such, but rather to begin treatment earlier in order to raise the chances of a cure. The definitive criterion of the success of early detection is therefore a decline in cancer mortality.



**Figure 1.2.19:** Estimated annual number and incidence of lung cancer in Germany (ICD-10: C33 – C34). Source: Central Cancer Documentation Centre, RKI



**Figure 1.2.20:** Lung cancer mortality rate in Germany (age-standardized). Source: Central Cancer Documentation Centre, RKI

dence rates do not necessarily reflect an increased cancer risk. They may instead just be pointing to an increased detection rate of the preclinical and early stages of certain types of cancer. The purpose of the early detection of cancer is not the earliest possible diagnosis as such, but rather to begin treatment earlier in order to raise the chances of a cure. The definitive criterion of the success of early detection is therefore a decline in cancer mortality.

#### 1.2.6.1 Lung cancer

**Three times as many men as women develop lung cancer.** Cancer of the trachea, bronchia and lungs – lung cancer for short – is the third most common type of cancer in both men and women in Germany. In 2002 about 32,500 men developed lung cancer – almost 15 percent of all cancers in males and the cause of more than a quarter of all male cancer deaths. Lung cancer in women, at around 12,500 new cases a year, represents only 6 percent of all cancer cases and 10 percent of deaths caused by cancer in women.

The mean age of onset is 68 for men and women, about the average age for developing cancer (men 68.5, women 69). Compared to the rest of the EU, the incidence rate in German men and women is average. The highest rate among men is in Belgium, the Netherlands and Italy, among women in Denmark, the UK and the Republic of Ireland. The lowest incidence rate is among men in Sweden and Portugal and among women in Spain and Portugal.

**With increased cigarette consumption, women are catching men up in the lung-cancer incidence rate.** The main risk factor for lung cancer has been known for a long time. Up to 90 percent of the cases of lung cancer among men and 60 percent among women can be traced to active cigarette smoking. The mortality and incidence rate in German men peaked between the middle and end of the 1970s. Since then there has been a recognizable decline in age-standardized incidence rates of 0.9 percent a year. But because the proportion of elderly and older men in the population is growing, the number of incident cases is still increasing by 0.9 percent a year.

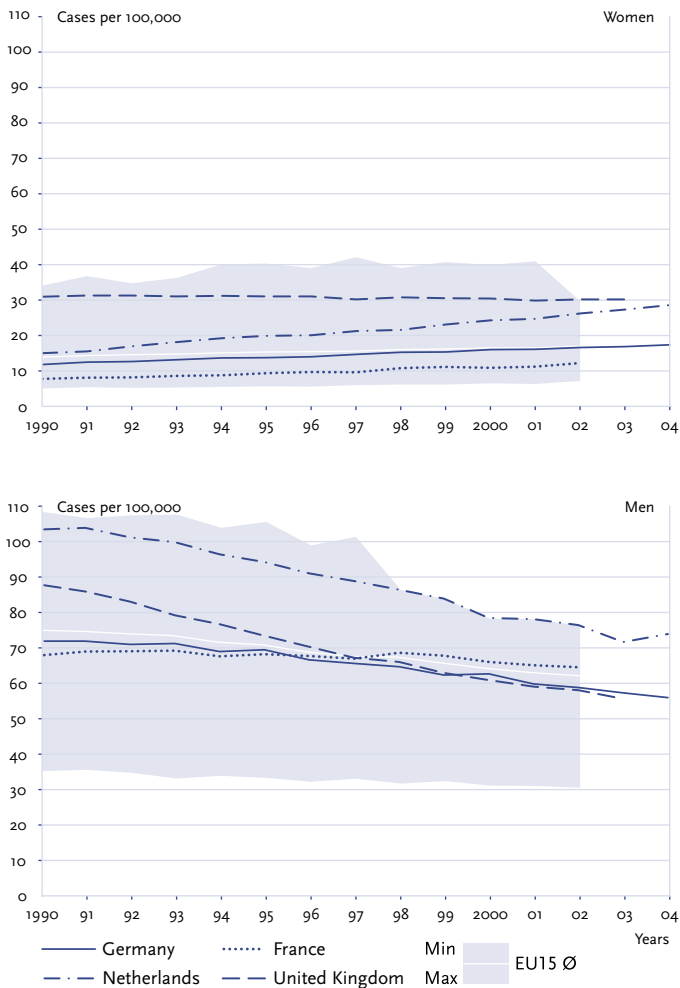
By contrast, the age-standardized incidence rate among women has risen by 4.5 percent a year and the number of cancer cases by six percent a year since the 1980s (see Figure 1.2.19).

Different trends in age-standardized incidence rates in men and women are the result of changes in smoking behaviour which took place much earlier, with women smoking considerably more than they used to. The present smoking behaviour of young men and women (see Chapter 2) suggests that existing differences in lung-cancer incidence and mortality rates between men and women will continue to diminish.

The demographic ageing process is an important force driving cancer trends.

As a rule cancer occurs much more frequently among older people. In order to enable meaningful comparisons over time, the rates are age-standardized to ensure that they are independent of changes in the age structure of the population.

Age-standardized cancer-incidence rates are a measure of the cancer risk in the population. The annual number of cancer cases depends largely on the proportion of elderly and older persons in the population. Since cancer cases become more frequent with advancing age, quite independently of other risk factors, the number of cancer cases can be rising even when standardized incidence rates are constant or decreasing. This is currently true for Germany. In the coming decades the demographic ageing process can be expected to remain an



**Figure 1.2.21:** Mortality rate for lung cancer: a European comparison.  
Source: WHO HFA January 2006

important force behind the increase in annual cancer cases and deaths.

**Lung cancer is an especially vicious cancer.** It is responsible for 26 percent of all deaths caused by cancer among men and 10 percent among women. Lung cancer has one of the poorest prognoses of all cancer sites, as is shown in its poor five-year relative survival rate. The five-year relative survival rate reflects the proportion of patients who would survive the diagnosis of their disease by at least five years, assuming there were no other causes of death except lung cancer. The rate is almost identical for men and for women at 12 and 14 percent respectively.

Since 1990 the age-standardized lung-cancer incidence rate in Germany has risen from 11.5 to 16.3 deaths per 100,000 persons in women (see Figure 1.2.20). In men, by contrast, the rate has fallen from 71.9 to 58.7 per 100,000 persons, as has the incidence rate.

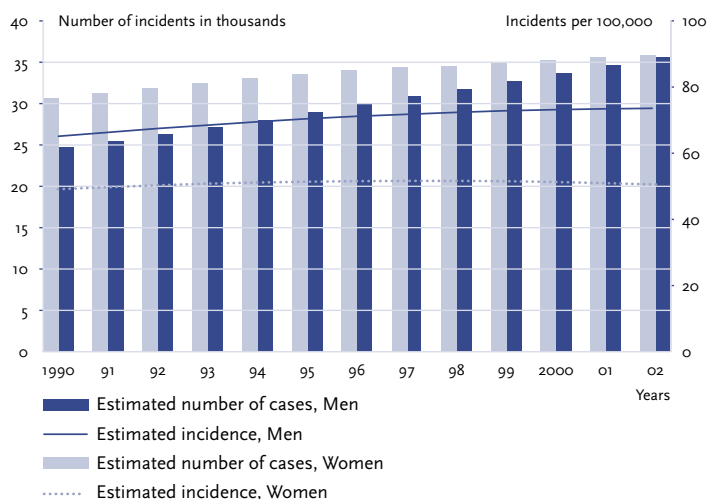
By international comparison, the lung-cancer mortality rate in German women has been approaching the EU-15 average. The lung-cancer mortality rate is noticeably higher among women in Denmark, the UK and the Netherlands (see Figure 1.2.21). The mortality rate among German men is below the EU comparative average. In 2001 Danish women and Dutch men had the highest lung-cancer mortality rates (EU-15 countries).

**The demographic ageing process is an important force driving cancer trends.**

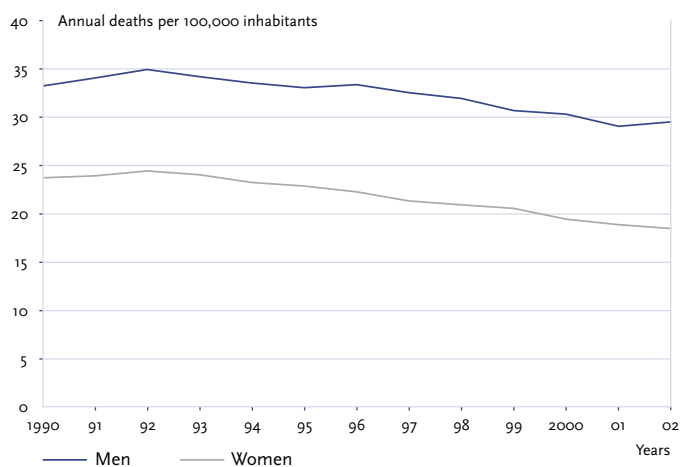
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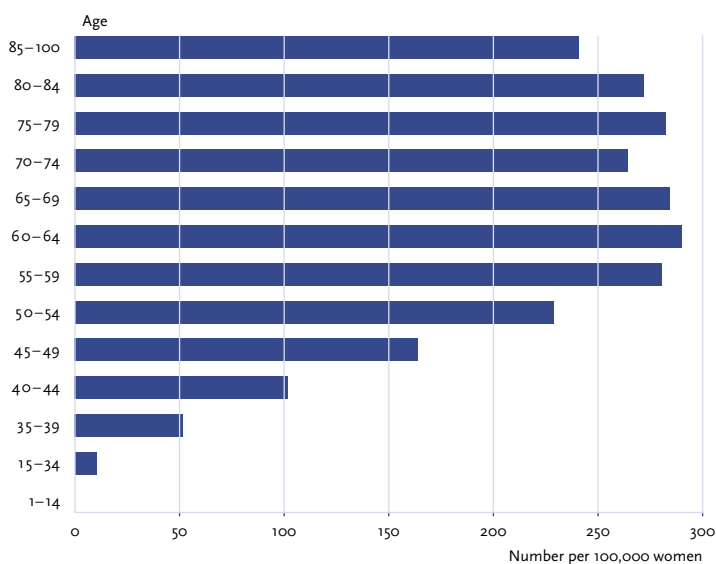
when standardized incidence rates are constant or decreasing. This is currently true for Germany. In the coming decades the demographic ageing process can be expected to remain an important force behind the increase in annual cancer cases and deaths.



**Figure 1.2.22:** Estimated annual number and incidence of bowel cancer in Germany (ICD-10: C18 – C21). Source: Central Cancer Documentation Centre, RKI



**Figure 1.2.23:** Bowel cancer mortality rate in Germany (age-standardized). Source: Central Cancer Documentation Centre, RKI



**Figure 1.2.24:** Estimate of the age-specific breast cancer incidence in Germany per 100,000 women in 2002. Source: GEKID, RKI: Cancer in Germany [94]

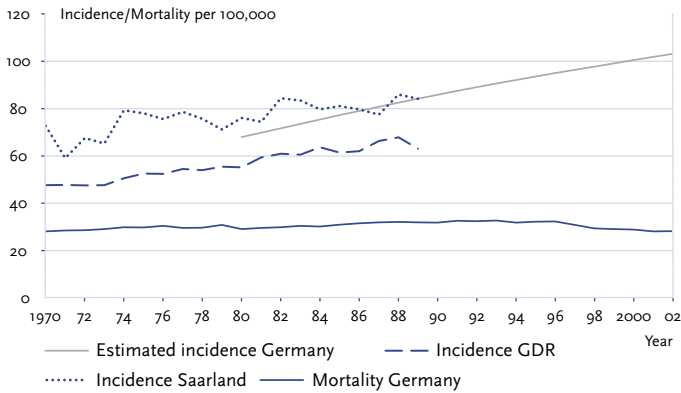
### 1.2.6.2 Bowel cancer

**Statistically, bowel cancer ranks second for men and women.** In both sexes it has become the second most common type of cancer and the second most common cause of cancer deaths. (The term bowel cancer is used here to include colon, rectal and anal cancer, but not the rare cancers of the small intestine.) In 2002 an estimated 35,600 men and 35,800 women developed bowel cancer. In most cases, bowel cancer develops late in life, at a mean age of 69 in men and 75 in women. Germany has the highest incidence rate amongst both men and women compared to other EU countries. The lowest incidence rates of this disease in the EU are to be found in Greece and Finland.

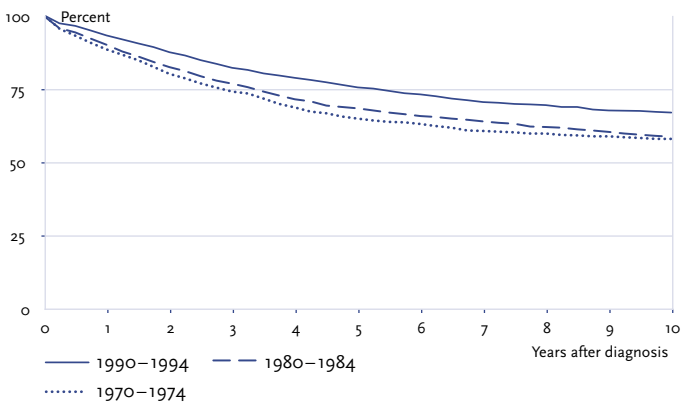
**The extent of bowel-cancer risk depends on dietary habits.** Frequent consumption of meat and animal fat, a low-residue diet, alcohol consumption, overweight and a lack of physical activity have all been discussed as possible risk factors of bowel cancer. Results from the EPIC study [92], which examined the connection between diet and cancer risk, suggest that the risk of bowel cancer among people with a daily fibre intake of about 35 grams is 40 percent lower than among people whose average fibre intake is only 15 grams a day. Consumption of red and processed meat also raises the risk according to the EPIC study, whereas consumption of fish might reduce it.

The early detection of bowel cancer is part of the statutory cancer screening programme. Men and women from the age of 50 are entitled to examinations for the early detection of cancers of the rectum and the colon. Persons between the ages of 50 and 54 are offered a rapid faecal occult blood test. In addition, people aged 55 may have a colonoscopy, followed by a second one ten years later. Insured persons who abstain from an early detection colonoscopy can instead have a faecal occult blood test at two-yearly intervals (see also Chapter 3).

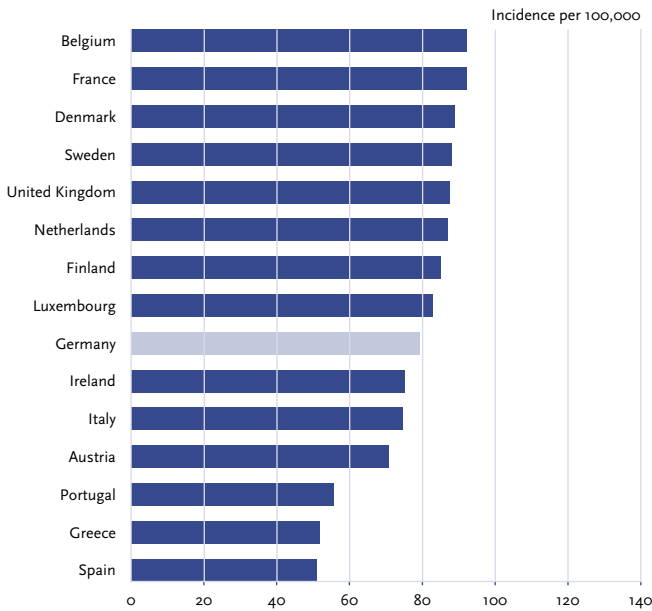
**Bowel cancer has, by and large, a very good prognosis.** The age-standardized incidence rates in men remained static in the second half of the 1990s, following an increase in the first half. In women the incidence rates remained almost unchanged throughout the 1990s. In terms of figures, the incidence rate among men has risen by about two percent a year since 1980, among women by only 1.3 percent a year. However, the annual number of new cases of bowel cancer in men has been rising by about 4.4 percent a year since 1980, reaching 35,600 cases in 2002. The mean increase among women in the same period was only 2.7 percent, and the annual number of cancer cases has remained more or less constant since the mid-1990s at around 35,000 cases a year (see Figure 1.2.22). The five-year relative survival rate is 56 percent for both men and women. The bowel-cancer mortality rate in men and women has been falling since the late 1970s – by 0.6 percent in men and 1.3 percent in women (see Figure 1.2.23).



**Figure 1.2.25:** Age-standardized incidence and mortality for breast cancer in Germany 1970 – 2002, Women. Source: GEKID, RKI: Cancer in Germany [94]



**Figure 1.2.26:** Survival rate for breast cancer patients by time period of diagnosis. Data: Epidemiological Cancer Registry, Saarland. Source: Estimates of the Central Cancer Documentation Centre, RKI [93]



**Figure 1.2.27:** Age-standardized incidence of breast cancer in the European Union 2002 (World Standard). Source: GLOBOCAN Estimate 2002, RKI Estimate for Germany 2002. Source: GEKID, RKI: Cancer in Germany [94]

**1.2.6.3 Breast cancer**

**One woman in eleven develops breast cancer in the course of her life.** Breast cancer is the most common type of cancer among women in Germany and worldwide. Men develop breast cancer about 50 to 100 times less often than women. In 2002 breast cancer accounted for about 27 percent of all cancers among women. The Central Cancer Surveillance Programme at the Robert Koch Institute estimates that more than 55,000 women developed breast cancer in Germany in 2002.

The so-called lifetime risk of developing breast cancer is 9.2 percent for women. In other words, one woman in eleven develops breast cancer in the course of her life [93].

The risk of breast cancer increases with advancing years. The rise in age-specific incidence is particularly striking among persons between the ages of 20 and 50. The incidence rate is highest for people over the age of 55 after the onset of the menopause (see Figure 1.2.24).

Around 40 percent of breast cancers and almost 30 percent of fatalities due to breast cancer occur among women between the ages of 35 and 59. The mean age of onset of the disease is correspondingly low at just over 62.5.

**The risk of dying from breast cancer is falling.** The Central Cancer Surveillance Programme has estimated the annual breast-cancer incidence rate between 1980 and 2002. For the period after 1994, data were also used from the Combined Cancer Registries of Saxony and Mecklenburg-Western Pomerania in addition to the data from the Saarland Cancer Registry. The resulting estimate shows that the incidence rate in Germany is considerably higher than the one registered in the former GDR (East Germany) up to 1989 and slightly higher than the rate currently registered in the Saarland. Since the mid-1990s, however, the rise in the incidence rate has been accompanied by a declining mortality rate. More tumours are being detected, thanks to more sensitive diagnostic procedures (mammography compared to palpation of the breast, for instance), and the chances of surviving cancers detected at an earlier stage are much better than they were before. As a result, deaths due to breast cancer are decreasing among women.

**The survival rates are rising.** Breast cancer is responsible for 18 percent of all cancer deaths among women and ranks number one in the statistics of cancer mortality in women: 17,780 women died of breast cancer in Germany in 2002.

A comparison of the survival of women with breast cancer diagnosed between 1990 and 1994 with survival rates in former periods indicates dramatic improvements (see Figure 1.2.26). According to the latest calculations from the Robert Koch Institute, the five-year survival rates for women with breast cancer registered in the Saarland Registry between 1994 and 1998 is 79 percent. Breast cancer, therefore, has a good prognosis compared to other cancers. The five-year survival rate for women with stomach cancer is 29 percent and for women with lung cancer 14 percent. This is confirmed by a considerable rise in the 10-year survival rates compared to breast cancer diagnosed in the 1980s.

**A million women worldwide develop breast cancer every year.** According to estimates by the World Health Organization more than a million women developed breast cancer worldwide in 2000. 370,000 died of breast cancer. Expectations for Europe in the same year were 350,000 new cases diagnosed and 130,000 deaths caused by breast cancer. Compared to other EU countries, Germany has a middle position in terms of both incidence and mortality rates (see Figure 1.2.27).

Localisation	Women		Men	
	Relative Survival Rates Diagnosis period 1994–1998; Saarland	Relative Survival Rates Diagnosis period 1985–1988; Saarland	Relative Survival Rates Diagnosis period 1994–1998; Saarland	Relative Survival Rates Diagnosis period 1985–1988; Saarland
Total cancers (excluding C 44)	58	53	46	40
Lips, oral cavity, throat (C00–C14)	60	56	46	43
Oesophagus (C15)	27		19	
Stomach (C16)	29	28	27	27
Bowel all (C18–C21)	56		56	
Pancreas (C25)	4		5	
Larynx (C32)	65	68	60	71
Trachea, Bronchia, Lungs (C33–C34)	14	17	12	9
Skin (C43)	89	80	81	69
Breast (C50)	79	73	.	.
Uterus (C54–C55)	77	70	.	.
Cervix uteri (C53)	67	64	.	.
Ovary (C56)	41	35	.	.
Prostate (C61)	.	.	82	70
Testicles (C62)	.	.	98	93
Kidneys and urinary passages (C64–C66, C68)	67	56	66	49
Urinary bladder (C67)	53	63	57	78
Thyroid (C73)	88	77	79	67
Lymphoma (C82–C85)	61	56	53	52
Hodgkin (C81)	89	65	79	73
Leukaemia (C91–C95)	44	42	46	42

\* Owing to modifications in the classification system (ICD-9 over to ICD-10) comparisons are not always possible

**Table 1.2.6:** Five year survival rates (in percent), Saarland, Period of diagnosis 1994–1998, Age 0–89. Data: Epidemiological Cancer Registry, Saarland. Source: Central Cancer Documentation Centre estimates

#### Methodological commentary

The calculation of the five-year relative survival rates is based on data from the Saarland Cancer Registry, as population-based data for the required long-term period are available only from there. All cancer diagnoses between 1994

and 1998 for people under the age of 90 were included in the survival rates given here.

Unlike earlier calculations, the occurrence of a second cancer in the course of the disease did not end the observation. This may worsen the survival rate for any cancer that is frequently followed by a second cancer with a poorer prog-

nosis, such as lung cancer. Survival rates vary widely, depending on the stage of the disease at the time of diagnosis. The overall five-year relative survival rates given here do not take the stage of the disease into account (source: Central Cancer Documentation Centre).



**Patients should be more closely involved in decisions about therapy.** Higher quality in terms of early detection, therapy and aftercare is the intention behind various health-policy measures on breast cancer. They include the introduction of nationwide, quality-assured mammography screening; the publication of the interdisciplinary guidelines “Diagnostics and Therapy for Breast Carcinoma” by the German Cancer Society and participating specialist organizations in May 2004; the guidelines for improved care formulated within the framework of the “gesundheitsziele.de” initiative; the introduction of a structured programme of treatment (disease-management programme) for breast cancer; and the certification of so-called breast cancer centres. What is also needed is better information for the patients, and their closer involvement in decision-making about therapy.

Breast cancer can only be prevented to a limited extent (primary prevention), which makes early detection and therapy (secondary prevention) particularly important.

The results of the so-called WHI study (Women’s Health Initiative) show that the risk of breast cancer among women aged over 50 can increase as a result of the long-term intake of hormone (oestrogen or oestrogen-gestagen) preparations. This has led to a critical attitude towards long-term treatment with hormones during and after the menopause and a corresponding change in product information and therapy recommendations.

► Comprehensive Information on **breast cancer** is to be found in booklet 25 of the Federal Health Reporting’s series.

#### 1.2.6.4 Survival rates for cancer

**Most cancer patients have a better chance of survival than ever before.** The chances of surviving cancer have been rising for women since the 1970s and for men since the mid-1980s. The positive trend is partly due to a shift from stomach cancer to bowel cancer, i.e. from a type of cancer with a bad prognosis to one with a considerably better one. Another factor in the figures for men is the increased number of cases of prostate cancer, which often has a good prognosis, thereby contributing to favourable overall figures on cancer survival.

Comparing the periods 1985–1988 with 1994–1998, it can be seen that the five-year relative survival rate has increased from 53 to 58 percent among women, and from 40 to 46 percent in men.

The survival difference between the sexes is mainly caused by differences in site distribution by gender. Men are more prone to lung cancer and cancer of the oesophagus, where the chances of survival are poor; women on the other hand fre-

quently develop breast cancer, which on the whole, has a far better prognosis.

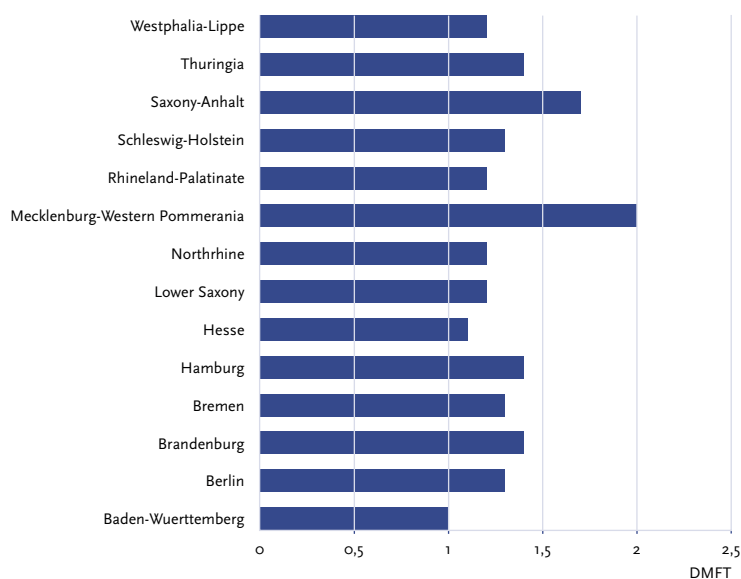
The generally positive trend is reflected by nearly every individual cancer site (see Table 1.2.6). Since the mid-1980s the five-year survival rates for men and women with malignant melanoma of the skin, thyroid cancer or Hodgkin lymphoma have improved considerably. Likewise, survival with breast or prostate cancer and cancer of the womb has notably improved.

Survival has improved to a lesser degree for cancer of the oral cavity and throat. In the case of lung cancer and cancer of the larynx, the situation has improved among men, but worsened for women. Cigarette smoking contributes to all these types of cancer, so that cancer of the oral cavity, throat cancer and cancer of the larynx are not uncommonly followed by the development of lung cancer, which has a much poorer prognosis. The current five-year survival rates for women with lung cancer (14 percent) are slightly worse than the survival rates with lung cancer diagnosed between 1985 and 1988 (17 percent). They are still better than men’s survival rates (1994–1998, 12 percent; 1985–1988, 9 percent). This may be related to the fact that women develop a higher proportion of so-called adenocarcinomas, which have a more favourable prognosis than squamous and small-cell carcinomas. However, the calculation of survival rates for lung cancer in women is based on a much smaller number of cases than in men, so that the figures are less reliable and corresponding caution is called for when interpreting them.

#### Definition

Relative cancer survival rates indicate the proportion of people who would survive their disease for several years (usually 5 or 10 years) if cancer were the only cause of death. In order to adjust the relative survival rate to allow for other causes of death, the mortality of patients is compared with that of people of the same sex and age in the general population. For young cancer patients, the relative and absolute survival rates are virtually identical, whereas for older people the relative survival rates are better, because they are adjusted to allow for other causes of death.

The relative survival rates are used as a measure in the prognosis of cancer diseases. A relative survival rate of 100 percent, for example, would mean that the mortality of the people affected is identical to that of the general population and that the cancer does not cause any additional deaths.



\* German national average: 1.2; WHO Target for the year 2000: 2.0

**Figure 1.2.28:** Regional distribution of dental caries (DMFT) among 12 year olds Germany in 2000\*. Source: DAJ 2001

Age (in years)	Mean figure of number of affected teeth	
	Total DMF-T	
	1989*/1992**/1994***	1997*/2000**
6-7	2.89***	2.21**
9	1.5*	0.45**
12	2.44**	1.2**
35-44	17.5*	16.1*
65-74	-	23.6*

**Table 1.2.7:** Dental health (caries occurrence). Source: Institute of German Dentists (IDZ) surveys 1989, 1992, 1997; DAJ studies 1994, 2000

Year	Level of parents' schooling		
	Low	Middle	High
1989 (German oral health study I)	9.5%	13.0%	28.6%
1997 (German oral health study III)	44.8%	34.3%	50.1%

**Table 1.2.8:** Percentage of natural sets of teeth among 12 year olds in relation to their parents' educational background. Source: IDZ surveys 1989, 1997

### 1.2.7 Dental and oral disorders

#### ► Abstract

**Children and adolescents in Germany have healthier teeth today than ever before. The number of caries-affected teeth has fallen during the past decade: the average rate for 12-year-olds is 1.2 affected teeth, which is below the World Health Organization's DMFT figure of 2.0.**

**In adults, root-surface caries in particular plays a more important role with increasing age, as do periodontal diseases, although the latter also occur among young people.**

**Oral health is determined in part by social status. It is worse in eastern than in western Germany.**

**In 2003 statutory health insurance spent around €11.8 billion on dental treatment and dental prostheses.**

**Nearly all adults are affected by caries or periodontitis.** They are the most common diseases of the viscerocranium (face, oral cavity and jaw) and more than 95 percent of adults in Germany have or have had one or both of them.

Healthcare costs reflect this. The statutory health insurers spent a total of €11.8 billion on prostheses and dental treatment in 2003 (1995: €10.8 million), which corresponds to about 8.2 percent of their total expenditure on benefits (1995: 10.0 percent) [95].

Hygienic measures such as cleaning teeth, a healthy diet and dental check-ups help to maintain dental health.

**Children and adolescents in Germany have healthier teeth than ever before.** A marked decline in caries among children and adolescents has been observed in the Western industrialized countries in recent years. Representative data for the German population come from the German Oral Health Study (DMS), carried out by the Institute of German Dentists (IDZ), and from the surveys conducted by the German Association for Dental Care for the Young (DAJ).

The number of teeth affected by caries, filled or missing (DMFT) in 12-year-olds averaged 1.2 in 2000, well below the World Health Organization's requirement of 2.0 DMFT. A downward trend in caries can also be observed in 6- to 7-year-olds and 9-year-olds, whereas no noticeable change was found among 35- to 44-year-olds (see Figure 1.2.7) [97, 98].

In the 1997 IDZ survey, in which 12-year-olds were examined, there were marked differences between eastern and west-

ern Germany. The mean DMFT value for east German youth was 2.6 teeth; among west Germans of the same age it was 1.4.

Similarly, the IDZ survey uncovered differences between young males and females. The DMFT index as a nationwide average was somewhat higher for girls (1.9) than for boys (1.6). This can be explained by the fact that girls shed their milk teeth earlier than boys, so that, at the age of 12, girls' second teeth would have been exposed to damaging influences for a longer period of time than boys' teeth.

The survey found that girls had more filled, i.e. treated, teeth than boys. Very few teeth in the 12-year age group had been extracted because of caries.

**Social disparities influence the frequency of caries.** As in other comparable industrialized countries, the rate of prevalence of dental caries in Germany varies according to region and social background. The mean DMFT value for 12-year-olds in 2000 was under 1.5 in most federal states of Germany. The best standard of oral health was recorded in Baden-Württemberg [97] (see Figure 1.2.28).

The burden of disease caused by caries is mostly carried by a relatively small group of people. This uneven distribution can be observed to a greater or lesser extent in all age groups. In 1997, only 22 percent of 12-year-old children accounted for 61 percent of the teeth counted in the DMF index [98].

Children and adolescents from socially disadvantaged groups are disproportionately affected by caries. An analysis in the course of the 1997 IDZ study shows that caries was particularly common among those who did not go to the dentist for routine check-ups, who brushed their teeth less often than twice a day, and who had never been shown the proper way to brush their teeth by a dentist.

The educational level of parents also influences the oral health of children and adolescents. More healthy sets of teeth were found among 12-year-olds whose parents had high educational qualifications than among the children of parents with a lower educational background (see Figure 1.2.8).

**Feeding bottles with sweet liquids lead to caries of the milk teeth.** Liquids containing sugar taken in through a feeding bottle (instant teas, cocoa, milk with honey) can lead to caries in the milk incisors of the upper jaw and also affect other teeth. Five to ten percent of 1- to 6-year-olds in Germany are affected by this so-called nursing bottle syndrome, or early-childhood caries [99].

Superficial non-carious tooth damage has become more common in small children, children, adolescents and adults in recent years. The intake of drinks containing acids or sugars (soft drinks, soda pop, cola, fruit drinks, fitness drinks) leads to the release of minerals from the dental enamel prior to so-called dental enamel erosion. In 1997 erosion and cuneiform defects were found in 42.1 percent of 35- to 44-year-olds and 46.3 percent of 65- to 74-year-olds.

According to the 2000 DAJ study carried out in 14 federal states, 33 to 60 percent of 6- to 7-year-olds, 28 to 46 percent of 9-year-olds and 38 to 59 percent of 12-year-olds had naturally healthy, intact teeth [97]. Yet nearly all of them developed caries before reaching adulthood. It can be seen from the 1997 DMS

#### Definition

Dental caries is a decay of the so-called hard tooth structures, which include dental enamel, dentin and dental cement. Dental caries is caused by acids produced by the metabolism of bacteria that settle in plaque. Numerous biological, socio-economic and behavioural factors influence the probability and onset of the disease. The likelihood of developing caries is greatly increased by frequent consumption of sugary foods. Dryness of the mouth caused by low saliva production, which can be a side-effect of some medications, increases the risk of caries, since saliva normally acts as a natural rinsing agent against caries. Regular cleaning of the teeth and the use of fluoride compounds help to prevent dental caries.

Periodontitis is an inflammatory disease of the periodontium; the periodontium is made up of the gums, the periodontal, the root cement and the tooth socket. Like caries, periodontitis is created by the waste products of plaque bacteria. Cigarette consumption and diabetes are also considered to be risk factors [96]. A long-term consequence of both diseases can be tooth loss.

#### Definition

The so-called DMFT or DFMS index is normally used for the statistical registration of caries. All decayed (D), missing (M) and filled (F) teeth (T) or surfaces (S) are counted together. The index of caries attack increases in the course of a person's life.

	Total	Germany		Gender	
		Eastern Germany	Western Germany	Male	Female
	n = 645	n = 136	n = 509	n = 329	n = 317
CPI = 0 (no bleeding)	15.1 %	4.9 %	17.8 %	12.9 %	17.3 %
CPI = 1 (bleeding)	10.2 %	6.4 %	11.2 %	8.6 %	11.9 %
CPI = 2 (supra or subgingival dental calculus (tartar))	28.5 %	12.2 %	32.8 %	29.3 %	27.6 %
CPI = 3 (Periodontal pocket depth 4–5 mm)	32.2 %	45.2 %	28.7 %	31.2 %	33.1 %
CPI = 4 (Periodontal pocket depth ≥ 6 mm)	14.1 %	31.3 %	9.5 %	17.9 %	10.1 %

**Table 1.2.9:** Periodontal diseases (Community Periodontal Index-CPI maximum value) among adults (35 to 44 years old). Source: IDZ survey 1997

III study that only 0.8 percent of 35- to 44-year-olds had never developed caries [98].

The caries treatment ratio, which shows the extent to which teeth attacked by caries have been treated, is very high at 90 percent, both for adults (aged 35 to 44) and for older people (65 to 74) [98].

Caries attacks on the root surface become notably more frequent with advancing years. This is because attachment loss, caused by ill health or age-related, increasingly exposes the periodontal root surfaces. The DMS III study shows that 11.8 percent of 33- to 44-year-olds and 15.5 percent of 65- to 74-year-olds have at least one tooth with treated or untreated root caries. The incidence of root caries is likely to increase further in the future with the growing proportion of older people in the population, and as a growing number of people retain their teeth into advanced age. The figure for the total number of teeth at risk rises accordingly.

**Periodontitis is widespread among young adults.** According to the 1997 IDZ surveys, one in three adults between the ages of 35 and 44 is affected by advanced periodontitis (score 3 on the so-called Community Periodontal Index, CPI). One in every seven adults has damage to the dental socket that requires surgical attention (CPI score 4). Around 15 percent of 35- to 44-year-olds and 5.7 percent of older people were shown to have gums with no inflammation or damage of any kind (see Figure 1.2.9; the results for older people are not indicated).

A total of up to 25 million people in Germany suffer from moderate to severe periodontitis. The biggest difference between the genders, according to the results of the IDZ study, could be observed in deep periodontal pockets (score 4): they were almost twice as frequent in men as in women. Even greater are the regional differences: diagnoses of severe cases of periodontal disease are three times as frequent in eastern as in western Germany [98].

Dental loss caused by caries or periodontitis is mainly an issue for adults, less often for children and adolescents. A total absence of teeth in the upper and lower jaw is very rare, even in middle age: only 1.7 percent of 36- to 44-year-olds in Germany had no teeth of their own in 1997.

The situation for older people is different: in 1997, 24.8 percent of 65- to 74-year-olds were diagnosed as having no teeth of their own (men: 22.1 percent; women: 26.9 percent) [98].

#### Definition

The severity and prevalence of periodontal diseases are regularly assessed using the Community Periodontal Index (CPI) [53]. The index consists of five degrees of severity ranging from score 0 (gums and dental sockets healthy and without inflammation) to score 4 (most severe form of periodontitis with loss of dental function). In the case of score 1, periodontal diseases can be cured with improved oral hygiene, in scores 2 or 3 a dental hygienist must carry out intense cleansing procedures. Score 4 periodontitis requires surgical intervention.

### 1.2.8 Infectious diseases

#### ► Abstract

**An estimated 49,000 people were living with an HIV infection in Germany in 2005. Approx. 2,600 people contract the disease every year. This is a relatively favourable situation compared to European and international figures. Within 20 years the HIV/AIDS epidemic has developed into one of the world's gravest health problems. At the end of 2004 the World Health Organization reported a total count of just under 40 million people who were HIV positive [100].**

**7,184 persons contracted tuberculosis in Germany and 374 people died of the disease in 2003. Tuberculosis has been in decline in this country for the last fifty years, but worldwide it is on the increase. In 2002 the World Health Organization estimated the number of persons with tuberculosis at 8.7 million and the annual mortality rate at just under 2 million [101], showing an inconsistent picture for Europe. Tuberculosis is on the increase in eastern Europe, especially in the successor states of the former Soviet Union.**

**Influenza is one of the most common infectious diseases in Germany and worldwide. However, the scale of the epidemics, which occur mainly during the winter months, varies widely from one year to the next. A typically severe 'flu season in Germany could be expected to cause 5000 to 8000 fatalities. The most important measure in the fight against the disease is the influenza vaccination, but there remain marked vaccination deficits in certain risk groups.**

**Social circumstances affect the frequency of infections.** Many infectious diseases were effectively controlled or eradicated in the industrialized countries in the course of the 20th century thanks to improved living conditions, better hygiene and medical progress. In Germany the only infectious disease that currently ranks among the ten main causes of death is pneumonia [102].

This is a distinct contrast from the situation in developing countries, where infections cause a high proportion of all deaths. According to the World Health Organization (WHO), particularly significant infections include infections of the respiratory tract, HIV infections, diarrhoeal diseases, tuberculosis and malaria [103].

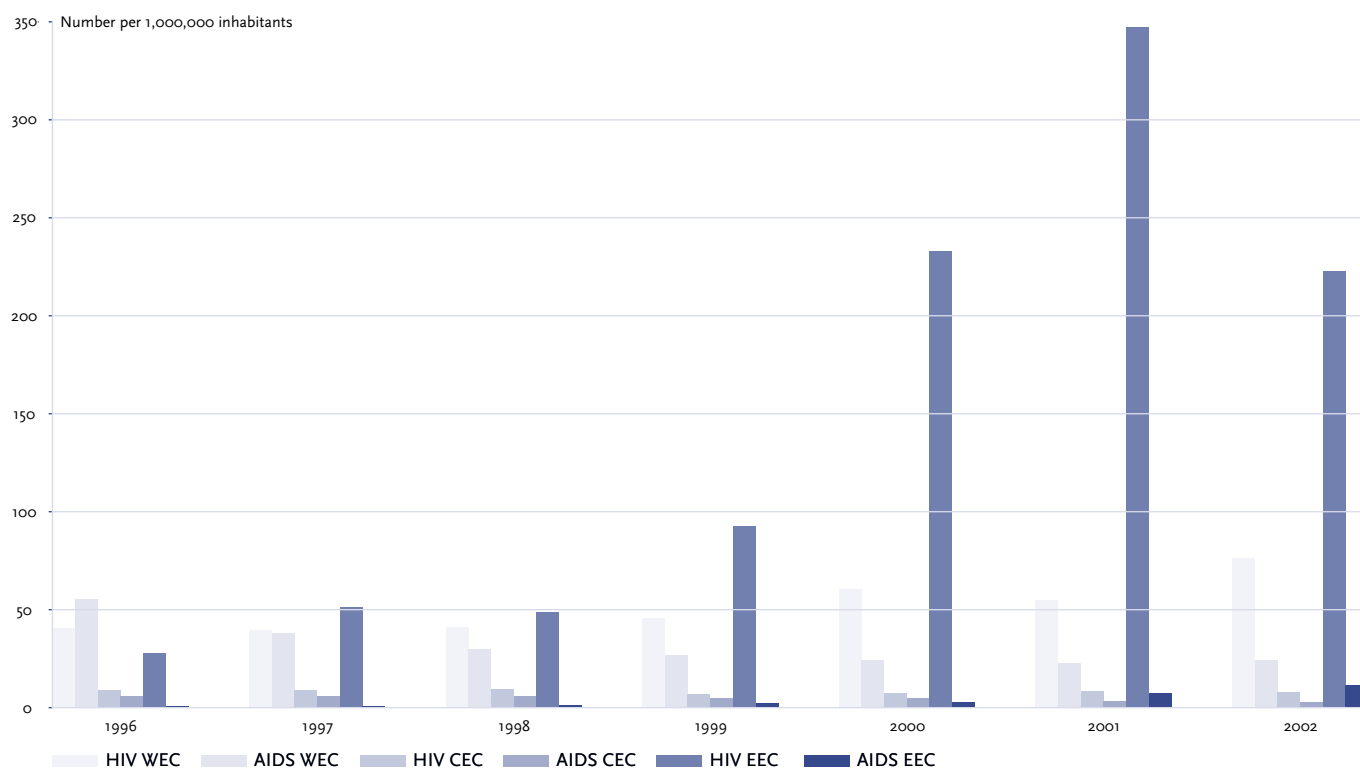
Nevertheless, in Germany infectious diseases still play a role in the disease spectrum that must be taken seriously. This is linked to social changes in the last decades, for example to developments in the field of urban development, traffic and transport, agriculture and industry as well as in dietary habits.

**In Germany there are 200,000 food-borne infections every year.** 200,000 cases of food-borne infection are reported every year in Germany, making them the most frequent notifiable diseases. The most common in this country are bacterial infections with *Salmonella* and *Campylobacter* and various viral infections.

The real figure for food-borne infections may well be higher than the official one. It has been estimated in the UK and the USA that for every officially reported case of *Salmonella* infection there are a further 3 to 50 undetected cases of salmonellosis [102, 104].

Global trade expansion and the increasing volume of travel can also contribute to the spread of pathogens. In the case of influenza, for example, these coherencies involve the risk of worldwide epidemics.

Another growing problem is the emergence of resistant pathogens. This trend, which makes infection therapy more dif-



West European Countries (WEC): Belgium, Denmark, Germany, France, Finland, Greece, United Kingdom, Ireland, Israel, Italy (AIDS only), Luxembourg, Malta, Monaco (AIDS only), Netherlands (since 2002), Norway, Austria (AIDS only), Portugal (since 2000), San Marino, Sweden, Switzerland, Spain (AIDS only)

Central European Countries (CEC): Albania, Bosnia-Herzegovina, Bulgaria, Yugoslavia, Croatia, Macedonia, Poland, Romania, Slovakia, Slovenia, Chechnya, Turkey, Hungary

East European Countries (EEC): Armenia, Azerbaijan, Estonia, Georgia, GUS, Kazakhstan, Kirgistan, Latvia, Lithuania, Moldavian Republic, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, White Russia

**Figure 1.2.29:** Estimate of new HIV infections and AIDS cases, figures adjusted for reporting delay, per 1,000,000 inhabitants per region in Europe in 1996 – 2002. Source: HIV/AIDS Surveillance in Europe, End-year report 2002, EuroHIV

ficult, has, for instance, been observed in tuberculosis for some time.

► The following booklets have been published by the Federal Health Reporting on the subject of infectious diseases: **New and Proliferating Infections** (booklet 18), **Hepatitis C** (booklet 15), **Food-borne Diseases** (booklet 6), **Health Problems for Travellers** (booklet 3), **HIV and AIDS** (booklet 31) and **Tuberculosis** (booklet 35).

#### 1.2.8.1. HIV/AIDS

**There are about 2,600 new cases of HIV infection every year in Germany (according to statistics at the end of 2005).** It is estimated that 49,000 HIV-infected persons were living in Germany at the end of 2005, of whom 40,500 were men and 8500 women; the number of children infected was less than 400. A total of 75,000 people have contracted HIV in Germany since the beginning of the epidemic [105].

With the help of improved therapeutic alternatives, fewer people are falling ill with AIDS and fewer are dying from it. This in itself has served to increase the number of HIV-positive persons living in Germany by about 1000 a year over the last few years.

In addition, since 2001 at the latest, the estimated number of new infections has begun to rise again, having remained relatively stable throughout the 1990s at around 2000 per year. Women account for a fifth of the newly diagnosed cases of HIV infection.

Worldwide the principle channels of HIV infection are sexual contact, the sharing of needles by drug abusers and the transfer of HIV infections from mother to child during pregnancy.

**The decline in the use of condoms has helped boost HIV infections.** About two-thirds of the new HIV infection diagnoses in Germany were of men who had had same-sex partners. 80 percent of those affected between 2001 and 2003 were between 25 and 49 years old at the time of diagnosis. An increase in the number of HIV diagnoses is currently being registered for this age group. Research on hazardous sexual behaviour shows that there has been a decline in condom use since the mid-1990s and a rise in risky sexual contacts. This is also reflected in the spread of other sexually transmissible diseases, such as syphilis and gonorrhoea ("the clap"), both of which can facilitate the transmission of HIV as a result of damage to the mucous membrane.

HIV infections among people coming from world regions of high prevalence accounted for around 18 percent of first diagnoses in 2005. Most of these people had probably already been infected in their home country.

The proportion of newly diagnosed HIV cases in which the cause was heterosexual contact was about 17 percent in 2005. The HIV epidemic started among heterosexuals with a considerable delay compared to other risk groups. However, the proportion of persons whose first HIV diagnosis originated in heterosexual contact has not changed significantly over the last ten years. Roughly the same number of men as women are affected. Only the proportion of infections caused by heterosexual contact is significantly higher for women than for men. In men the most common channel of disease transmission is same-sex contact.

The sharing of non-sterilized needles among drug addicts caused about seven percent of new infections in 2005. This figure had been falling since the early 1990s and has stabilized at between seven and eight percent in recent years. Among the drug addicts living in Germany, an increasing role is played in the figures for HIV infections by people coming from other European countries, especially from eastern Europe, where HIV has been spreading dramatically in the drug milieu since the late 1990s. Infection of newborn children by mother-child transmission constituted about one percent of new infections in 2005 in Germany. In most cases the transmission could have been prevented if the pregnant woman had been diagnosed in time.

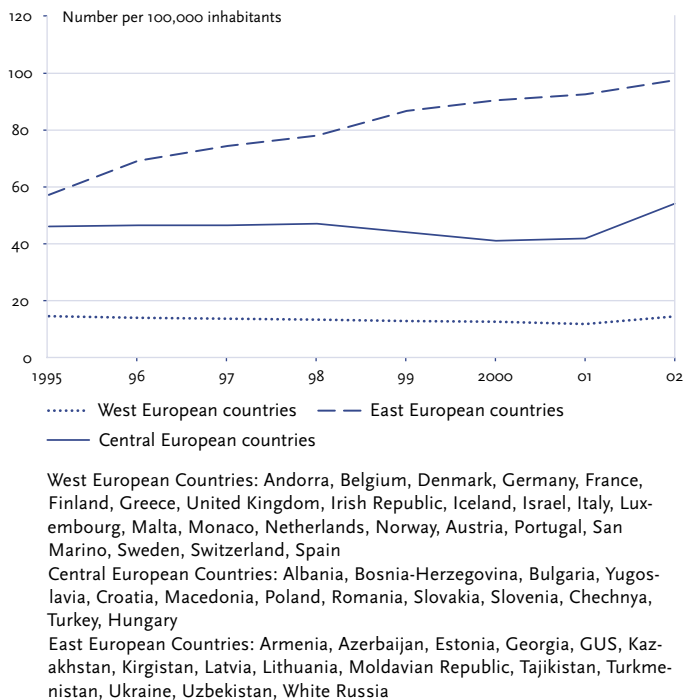
**The number of new AIDS cases fell due to improved opportunities for treatment.** About 31,500 people contracted AIDS in Germany in the 1980s, and about 26,000 died of AIDS in the same period. Since 1995, improved treatment methods have reduced the number of new cases annually reported; this tendency has begun to slow down, however. In 2005, an estimated 850 persons in Germany were diagnosed for the first time with AIDS; some 750 persons died as a result of the disease in the same year. The average age at the time of diagnosis was 38 in women and 42 in men.

The situation in Germany is relatively good compared to other European countries. Particularly in eastern European countries, the figures for new cases of HIV infections and AIDS are considerably higher (see Figure 1.2.29). This can be explained in part by the comprehensive and persistent preventive measures that were put in place at an early stage in Germany. However, the rate of new HIV infections has started rising again in recent years. Along with the increase in the number of other sexually transmissible diseases, this points to a renewed increase in risky behaviour.

#### Definition

The Human Immunodeficiency Virus, HIV for short, attacks the immune system of the human body and destroys the so-called T helper cells (CD4 - T Cells). An acute HIV infection is frequently accompanied by temporary influenza-like symptoms. As a rule this is followed by what is known as the latent phase, during which the virus multiplies in the organism but causes few, if any, complaints.

AIDS (Acquired Immune Deficiency Syndrome) only applies when the weakening of the body's defence mechanisms has reached an advanced stage. At this point diverse illnesses occur as a result of the immunodeficiency, for example pneumonia caused by pneumocystis, or abscess of the brain caused by toxoplasmosis. The period between an HIV infection and the onset of AIDS can be prolonged by many years using the improved treatment options available today.



**Figure 1.2.30:** Rates of officially reported cases of tuberculosis per 100,000 inhabitants by region in Europe between 1995–2002. Source: Report on Tuberculosis cases notified in 2002, WHO Collaboration Centre for Surveillance of Tuberculosis in Europe

### 1.2.8.2. Tuberculosis

**Around 7000 persons contract tuberculosis in Germany every year.** Tuberculosis has been in decline in Germany for the last fifty years. In 2003 there were 7,184 reported cases and 374 persons died of the disease [106].

The average annual incidence rate is 8.7 cases of tuberculosis per 100,000 people. The rate for men (11.0 cases per 100,000) is nearly twice as high as that for women (7.0 per 100,000). The difference lies in the higher incidence rate among men over 30; in the 15–30 age group the rate for women is almost as high as that for men. In 2003, 285 cases of tuberculosis were diagnosed in children under 15, an incidence rate of 2.3 per 100,000.

Above-average incidence rates are found in Hamburg, Bremen and Berlin as well as in the Saarland, Hesse, North Rhine-Westphalia, Saxony-Anhalt, Rhineland-Palatinate and Mecklenburg-Western Pomerania.

The incidence rate among foreign citizens in 2003 was 31.2 cases per 100,000 people, five times higher than among German citizens (6.2 per 100,000). This difference is even more marked among children and young adults.

With an absolute figure of 4,779 cases, two-thirds of officially reported tuberculosis cases were among people with German citizenship. Of the people with tuberculosis for whom there was information about their place of birth, 56 percent were born in Germany and 44 percent abroad. This ratio has remained broadly constant in recent years.

**A particularly large proportion of resistant pathogens come from countries of the former Soviet Union.** In Germany as well as worldwide, resistant pathogens constitute a growing problem in tuberculosis therapy. In Germany the development of resistant strains under therapy is mostly the result of courses of medication not being completed or of inadequate treatment. In many other countries factors that can be just as important include the absence of tuberculosis-monitoring programmes, a lack of opportunities to obtain diagnosis or treatment, or the use of poorer-quality medication. The highest rates of resistance in Europe are to be found in the successor countries of the former Soviet Union.

According to the German registration data, the number of pathogens that are resistant to at least one standard medication is constantly rising. In 1996 such pathogens could be found in nine percent, in 2003 about 13.3 percent of tuberculosis cases. A higher proportion of persons with the disease from abroad, especially the successor states of the former Soviet Union, had resistant pathogens compared to the federal average.

**HIV and tuberculosis often go hand in hand.** Despite existing control programmes, the annual number of new cases of tuberculosis is actually rising in many parts of the world. This is mainly the result of the spread of HIV/AIDS and the higher risk of contracting tuberculosis due to HIV/AIDS. The circumstances of migration, especially of economic refugees, provides favourable circumstances for both tuberculosis itself and its spread. The worldwide incidence rate for tuberculosis had been falling up to 1990. Since then it has been rising again at an annual growth rate of up to ten percent a year. Tuberculosis is especially common in sub-Saharan Africa (1.5 million new cases a year), in southern Asia (3 million new cases a year) and eastern Europe (250,000 new cases a year) [107]. The programme Surveillance of Tuberculosis in Europe (EuroTB) recorded a total of 404,628 registered cases in the European region in 2002 [108]. There is a striking difference in the incidence rate of tuberculosis between eastern and western Europe (see Figure 1.2.30) [109].



### 1.2.8.3 Influenza

**In Germany about 7000 to 13,000 people die of influenza every year.** Influenza is one of the most common infectious diseases in Germany and worldwide. It can take a very mild or very severe course and sometimes be fatal, especially when complications such as pneumonias are involved. In 2003 pneumonia ranked seventh in the cause-of-death statistics [102].

According to estimates calculated by the German Influenza Association (<http://influenza.rki.de>), 'flu epidemics, which occur mostly in the winter months, lead to two to three million visits to the doctor a year. Between about 7000 and 13,000 deaths from influenza can be expected in a typically severe influenza season. In a very severe epidemic these figures are easily exceeded [110, 111].

Persons over 60 and children, adolescents and adults with a chronic primary disease such as a lung or heart disease, diabetes, or people who are HIV infected, are particularly at risk. The Permanent Vaccination Commission of the Robert Koch Institute (STIKO) recommends persons in these groups to undergo an annual 'flu vaccination. The same recommendation is given to people who are highly vulnerable because of their occupation in health services, and to persons who are potential transmitters of the disease.

**Not many doctors, nurses and people active in healthcare are protected by vaccination.** In the last few years the vaccination rates have been rising, but it is far from the case that all risk groups are adequately protected against influenza. At an estimated 10 to 15 percent, the proportion of medical and care staff who are vaccinated is very low [7]. In the 2002/2003 season more than 40 percent of the over-65-year-olds took the opportunity to be vaccinated. As influenza viruses are very changeable, one shot alone cannot offer any permanent protection. The composition of the vaccine must be adapted every year to the varieties at large. For this reason national, European and global surveillance networks liaise closely with each other. The WHO analyses the types of virus made available by the worldwide influenza centres and recommends the vaccine composition for the coming season on that basis.

In addition, the Robert Koch Institute has published a so-called National Influenza Pandemic Plan, which is financed by the federal and state authorities. The plan contains recommendations as to how a worldwide influenza pandemic in Germany might be combated. For some years now the WHO has indeed estimated that the risk of an influenza pandemic is high, since certain types of avian influenza viruses have spread dramatically in southeast Asia. Given the appropriate genetic alterations, they might be able to unleash a sudden worldwide pandemic.



**Figure 1.3.1:** Trend of working days lost through sick leave in western and eastern Germany. Source: GKV statistics KM 1 (Statutory health insurance)

## 1.3 The consequences of sickness

### ► Abstract

Disability, the need for care, and the loss of potential years of life are among the most significant consequences of sickness at the individual level. From the economic perspective, sickness figures and early retirement represent considerable burdens, since lost working days add considerably to the indirect costs of sickness.

The number of working days lost due to sick leave has been falling since the mid-1990s and is now at about the same level in both eastern and western Germany. On average, every employee with statutory health insurance reports sick 14 days a year. The main causes are bronchial, muscular, skeletal and, increasingly, mental disorders. On the other hand, injuries are becoming proportionately less common. Mental disorders are an increasingly important factor in early retirement.

In Germany 6.6 million people are officially recognized as severely disabled.

About 83.5 percent of severe disabilities can be attributed to illness or disease. Congenital disabilities and accidents both play a minor role in the statistics.

About two million Germans meet the insurance criteria for persons in need of nursing care. According to current demographic estimates the number of people in need of care will increase sharply in the decades to come.

The most important causes of loss of potential years of life through death before the age of 70 are cancers, followed by cardiovascular diseases and so-called external causes, e.g. accidents and injuries.

### 1.3.1 Inability to work

**Sickness levels are falling in Germany.** While it was sometimes as high as 5.5 percent in the 1970s, the percentage of working days lost through sickness has been below 3.5 percent since 2004. This applies to both western and eastern Germany (see Figure 1.3.1).

In the early 1990s sickness levels in eastern Germany were still below those in western Germany, but higher levels were recorded in eastern Germany from 1995 to 2000. Since then sickness levels have been practically the same throughout Germany.

Apart from the number of persons falling ill, the sickness level depends very much on working conditions. When redundancy threatens, employees are less likely to stay off work when they are only slightly ill, because they are afraid of losing their job. Another factor is that – as a result of structural changes in the economy – jobs involving heavy physical work are not as common as they used to be; finally, older workers, who tend to be off sick for more days than younger workers, have been leaving their jobs to go into early retirement.

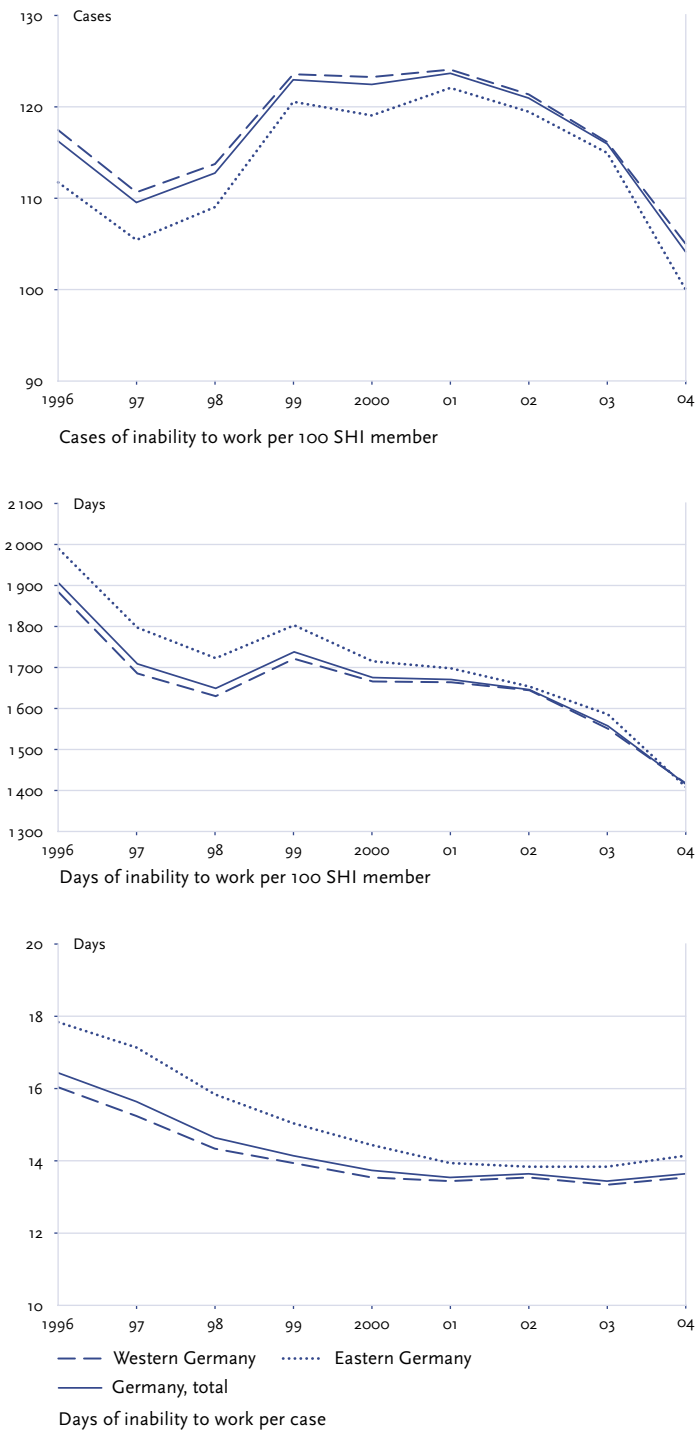
In 2005 the average sickness level fell to 3.3 percent, reaching the lowest level since the introduction of the selection method in 1970. There are seasonal variations in the individual months, and in eight out of twelve months in 2005 the sickness level was below the corresponding values for 2004. In eight out of twelve months in the year, the sickness level was lower than for the corresponding level in 2004.

The sickness level is recorded for a short period of time and its predictive value for the year is therefore open to question; for this reason the health insurance carriers calculate the total number of cases and days when employees have been unable to work in the form of a total count after the end of the business year. This collection of figures includes doctor's certificates that have been submitted late. A comparison shows that the sickness level and the number of days of inability to work per member follow the same trend over time, even if the levels diverge a little. The sickness level can therefore be taken to be a good

#### Definition

The sickness figure designates the quota of employees absent due to sick leave. The official sickness figure is calculated every month by the health insurance providers by counting the sick notes handed in by their members on the first working day of the month and comparing them with the number of members in employment. The sickness figure is therefore a random sample designated as a percentage value. The sickness figure calculated as an average for the year is the mean value of the twelve days in the year that have been designated, one from each month of the year.

In companies the sickness figure is often calculated using other methods, including or excluding other factors. These can include absence due to a health cure, if paid for by pension insurance, or after an accident at work when the cost is paid by the accident insurance. Thus it is often impossible to compare a company's sickness figure with the official one. In addition, the health insurance companies record the total number of cases of inability to work and the number of days taken off sick. This assessment count follows the closing of the financial year and incorporates all cases of inability to work with their days which were counted in that year or settled for that year. In order to compensate for the differences in size between the insurance carriers, the cases of inability to work and the number of days lost to sick leave are presented as cases and days per 100 members. A distinction is also drawn between various membership groups and between the sexes.



**Figure 1.3.2:** Trends in inability to work, days of inability to work and the average case duration in Germany.

Source: GKV statistics KM 1 (Statutory Health Insurance)

indicator of the development of the number of days lost due to inability to work.

**Sickness causes employees to miss over 14 working days a year.**

In 2004 a mandatory member of the statutory health insurance was off sick for an average of 14.1 calendar days, i.e. days including weekends and public holidays. The number of days lost to sickness is now 25% lower than in 1996 (average 17.7 days). This reduction is made up of a fall in the number of cases for every 100 statutory members from 116.5 in 1996 to 104 in 2004 (constituting more than 10 percent of the total decrease), and a reduction in the duration of sick leave from 15.1 days per case in 1996 to 13.6 days per case in 2004, a decrease of over 17 percent (see Figure 1.3.2).

The mandatory members in eastern Germany are off sick less often than those in western Germany, but the average length of the time they are off work is longer, so that the number of days lost through inability to work is about the same. This can also be seen in the levelling of the sickness levels.

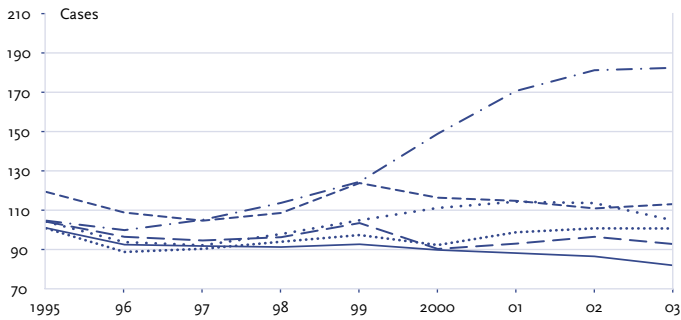
The fall in the number of working days lost through inability due to health problems is comparable to the fall in the sickness level rate, and the causes of inability correspond to the causes recorded in the sickness level statistics. In addition, many enterprises are seeking to reduce their costs by reducing sickness levels, or the time their employees are off sick, by increasing investment in both occupational health-promotion measures and the improvement of health and safety measures at work.

**Frequent reasons for reporting sick include respiratory diseases and muscular and skeletal disorders.** The most common reason for a doctor's certificate is a respiratory disease. According to data produced by the AOK (German statutory health insurance), 23.1 percent of cases of inability to work through sickness were caused by some kind of respiratory disease. Owing to the relatively short average duration of this type of disorder, the percentage of respiratory diseases in the overall status of employee's illness is only 13.7 percent.

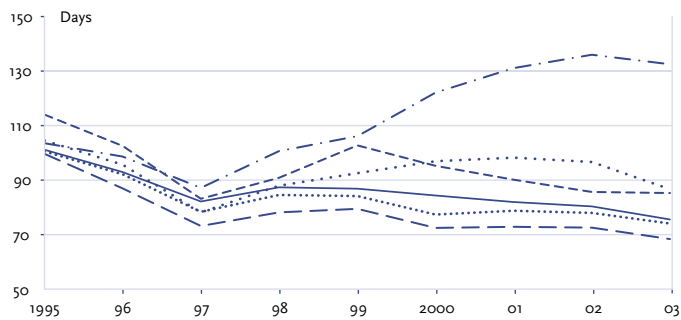
On the other hand, the most working days lost due to illness were caused by muscular and skeletal disorders, disorders which are associated with longer periods of incapacity. In 2003 this group of disorders accounted for 26.5 percent of working days lost due to illness, although they made up only 18.1 percent of all the cases of inability to work on health grounds.

There are still differences between western and eastern Germany as regards the causes of inability to work on health grounds. According to data from the AOK, muscular and skeletal disorders and psychic disorders are the cause of significantly more days off work in western than in eastern Germany. On the other hand, in eastern Germany, more days are lost through respiratory diseases, injuries, cardiovascular diseases and digestive disorders.

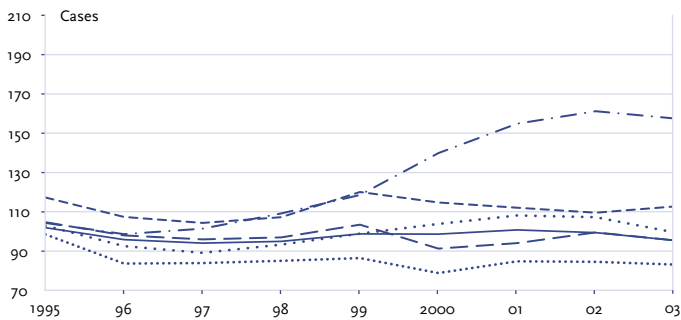
There are also clear differences between men and women in the statistics. Muscular and skeletal disorders and injuries lead to inability to work more often among men than among women. This may be connected to the fact that men still carry out more physically demanding and accident-prone activities than women. On the other hand, both mental disorders and respiratory diseases are more frequently the cause of inability to work among women than among men. The difference is particularly large in the case of mental disorders. Whilst these rank sixth in importance for men as the cause of working days lost on health grounds, they rank third in importance for women. Moreover, the percentage of sick notes due to cardiovascular diseases is somewhat higher among women, but, because men suffer from more severe and lengthy illnesses such as myocar-



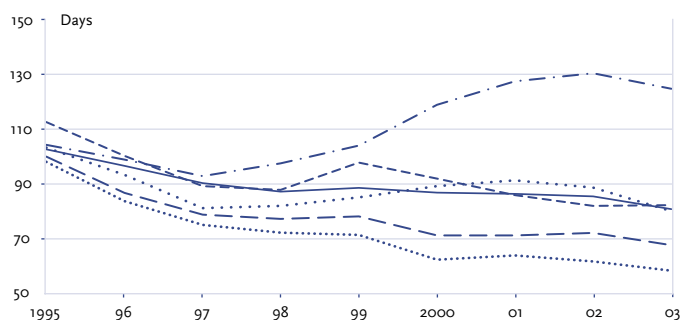
**Figure 1.3.3:** Cases of inability to work according to type of illness in men 1995 – 2003, Representation index (1994 = 100 %). Source: Scientific Institute of the AOK



**Figure 1.3.4:** Days of inability to work according to type of illness in men 1995 – 2003, Representation index (1994 = 100 %). Source: Scientific Institute of the AOK



**Figure 1.3.5:** Cases of inability to work according to type of illness in women 1995 – 2003, Representation index (1994 = 100 %). Source: Scientific Institute of the AOK



**Figure 1.3.6:** Days of inability to work according to type of illness in women 1995 – 2003, Representation index (1994 = 100 %). Source: Scientific Institute of the AOK

dial infarction, the number of working days when men are unable to work on health grounds is proportionately higher than it is for women.

**Despite falling sickness levels, working days lost through mental disorders are increasing.** Despite falling sickness levels, mental and behavioural disorders have increased in importance over the last few years as the cause of inability to work (see Figures 1.3.3 to 1.3.6). The percentage increase was higher among men than among women, with the result that the difference in rates of mental disorders between men and women has narrowed.

Between 1994 and 2003 the number of cases of inability to work caused by mental disorders rose by 81.6 percent among men and by 56.8 percent among women. The number of working days lost through the same causes increased by 31.9 percent for men and by 24.3 percent for women. Whether this trend is really the result of a higher incidence of mental disorders or whether doctors simply diagnose cases more frequently than in the past is a matter of controversy.

From 1994 to 2003 the number of working days lost owing to respiratory diseases also increased – by 12.3 among men and 11.9 percent among women. At the same time, however, the average period of illness-induced absenteeism declined, so that the number of working days lost owing to inability to work has in fact fallen.

There has been a decline in the number of cases of days lost through inability to work owing to digestive disorders and cardiovascular diseases. The number of working days lost owing to muscular and skeletal disorders rose between 1998 and 2001, but has subsequently fallen again. Here, too, the periods of time involved have fallen.

### 1.3.2 Early retirement

**Chronic diseases are the most common causes of early retirement.** Chronic diseases are the most common reasons for early retirement. Especially complaints that are not directly life-threatening, but which adversely affect the ability to work, play a particularly important role here. These include skeletal and muscular disorders and connective tissue diseases, circulatory diseases, psychic disorders and cancers. In 2003 these four disorders were the cause of 78 percent of early retirement in women and 75 percent in men.

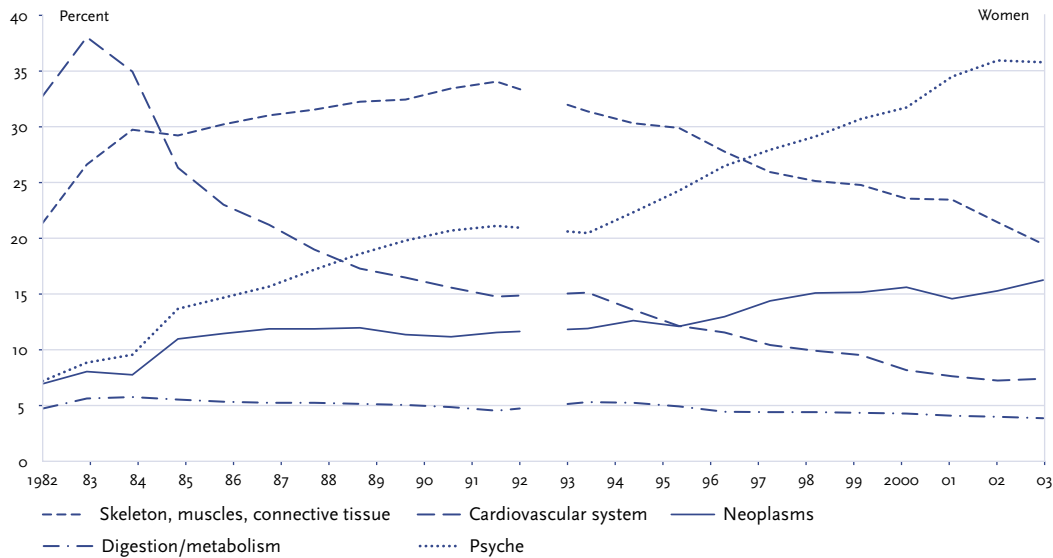
Trends in early retirement figures are thus not only determined by the shifting spectrum of diseases but also by changes in labour-market and social policies. Alterations to pension rights, for example, can play a role in deciding whether to go into early retirement. Such different aspects need to be borne in mind when assessing retirement statistics.

**Mental disorders are responsible for one in three cases of early retirement.** Digestive and metabolic diseases have not changed in importance for either men and women. Digestive and metabolic diseases remain of equal importance for men and women. An upward trend can be observed in malignant neoplasms. Cancers play a slightly more important role in the causes of early retirement for women in all age groups than for men (see Figures 1.3.7 and 1.3.8).

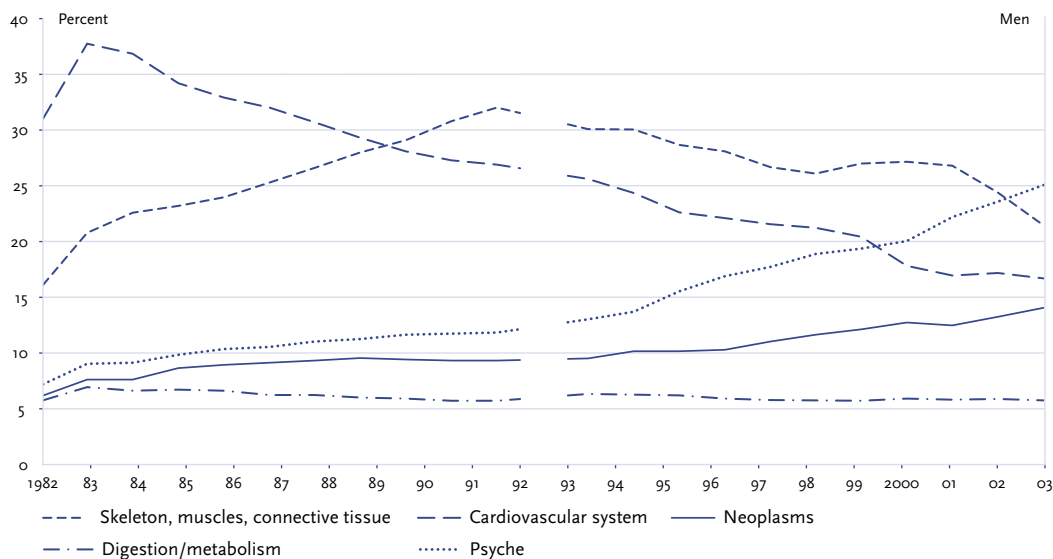
The most important causes of premature retirement for both men and women lie in muscular and skeletal disorders, connective tissue diseases, cardiovascular diseases and mental disorders. While cardiovascular diseases have been declining for years and the percentage of early retirement caused by muscular and skeletal disorders and connective tissue diseases is

Age group	Women		Men	
	Number	Percent	Number	Percent
Under 25	113,369	3.6	157,296	4.5
25 to under 45	311,108	9.9	375,790	10.8
45 to under 55	361,968	11.5	408,548	11.7
55 to under 65	616,445	19.5	868,816	24.9
65 and older	1,750,661	55.5	1,674,891	48.1
Total	3,153,551	100 %	3,485,341	100 %

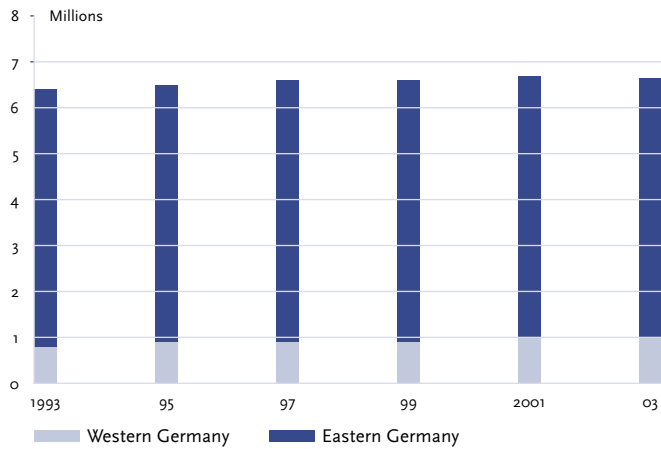
**Table 1.3.1:** Severely disabled persons at the end of 2003 – Percentage of all severely disabled persons by gender. Source: Statistic of severely disabled persons 2003, Federal Statistical Office [113]



**Figure 1.3.7:** Proportion of women retiring from work according to selected major diagnostic groups (till 1992: Old federal states; from 1993: Germany altogether). Source: Retirement Statistics; Association of German Pension Insurers (VDR)



**Figure 1.3.8:** Proportion of men retiring from work according to selected major diagnostic groups (till 1992: Old federal states; from 1993: Germany, altogether). Source: VDR Retirement Statistics; Association of German Pension Insurers (VDR)



**Figure 1.3.9:** Number of severely disabled persons from 1993 to 2003 (as per year's end). Source: Statistics on the Severely Disabled, 2003, Federal Statistical Office [113]

also declining, the trend in psychological complaints is moving in exactly the opposite direction: since 2003 they have been the most frequent reason for early retirement induced by illness.

► Comprehensive Information on **health-related early retirement** can be found in booklet 30 of the Federal Health Reporting's series [112].

### 1.3.3 Disability

**Every tenth person is disabled.** In 2003 a total of 8.4 million people officially recognized as disabled were living in Germany: about ten percent of the population [114]. 6.6 million severely disabled persons with a valid pass (eight percent of the population) were registered with the pension and welfare offices.

Over half of disabled people are men (54 percent). In 2003, 52.3 percent of registered severely disabled persons were men. The number of severely disabled people has risen by about 250,000 since 1983 (see Figure 1.3.9).

Three quarters of severely disabled people are older than 55 and about half of them are over 65. Nearly a quarter are between 55 and 65 years of age. Only four percent of severely disabled people are under 25 years old.

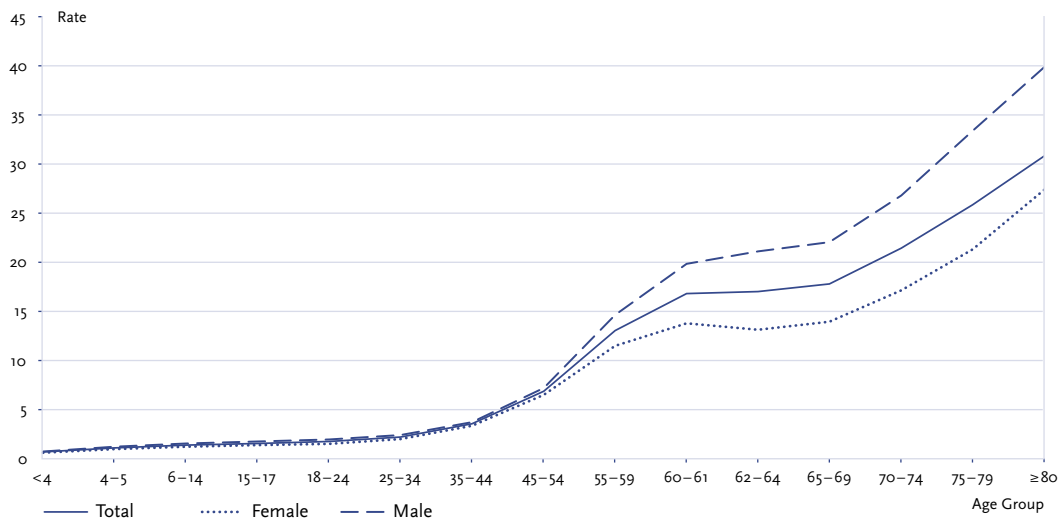
The proportion of severely disabled people in any given age group increases with age. While one person in 49 is severely disabled in the 25–35 age group, one person in three has a severely disabled person's pass in the over-80 age group (see Figure 1.3.10). In the age groups below 55 years, men are as often severely disabled as women; in the higher age groups, however, they are 1.5 times more likely to be affected than women. This is explained by the fact that as more men are employed than women, more men apply for the official recognition of a disability in order to take advantage of their employment and pension rights.

#### Definition and data basis

A disability, as defined by the German Social Security Code (SGB IX – “The Rehabilitation and Participation of Disabled People”), exists when it can be said that in all probability a person's physical function, mental ability or mental health will be impaired for longer than six months – compared to what would be typical for the person's given age – resulting in an adverse effect on the person's life in society. A person is deemed to be threatened with a disability when this adverse effect is to be expected. The normal symptoms of ageing do not constitute a disability as defined by SGB IX. This definition takes into account the international classification of Functioning Disability and Health (ICF) which, instead of focusing on disability, prioritizes the aim of participation in different areas in life. An application must be made to the responsible pension and welfare office for official confirmation and recognition of a disability or severe disability.

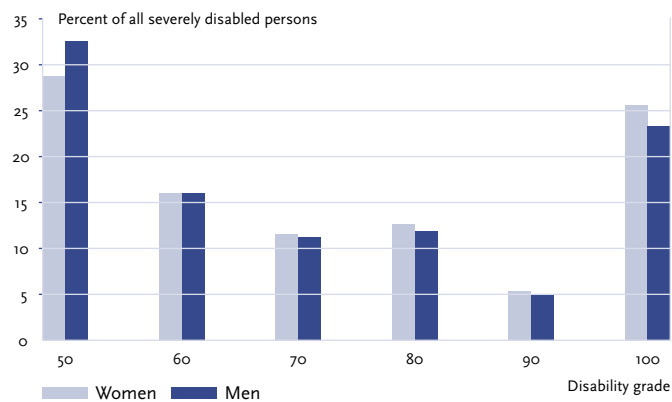
The statistical data on the severely disabled, based on the definition given by the SGB IX, cover people with a recognized level of disability of at least 50 percent who are in possession of a valid severely disabled person's pass. Furthermore, structural data about the life situations of disabled people is gathered in the microcensus and other representative surveys such as the Socio-Economic Panel Study (SOEP).

A comparison of the various data sources makes it clear that the number of those who, according to their own statements, consider themselves disabled or in need of assistance in coping with everyday life is higher than the official statistics. Since most of those affected do not apply for severely disabled status unless they see a chance to compensate for disadvantages in working life, it follows that the official figure for the severely disabled is misleadingly low among those who are not, or no longer, in employment; this is particularly likely in the case of women [113].



Population at 31.12.2003; Proportion in percent of severely disabled persons per population study group

**Figure 1.3.10:** Proportion of severely disabled persons as a percent of the respective age group. Source: Statistics on the Severely Disabled, 2003, Federal Statistical Office [113]



**Figure 1.3.11:** Proportion of severely disabled persons according to grade of disability and sex in 2003 (as per year's end). Source: Statistics on the Severely Disabled, 2003, Federal Statistical Office [113]

Cause	Severe Disability			
	Number		Proportion in percent	
	Women	Men	Women	Men
Total	3,153,551	3,485,341	100	100
General Illness	2,727,208	2,819,311	86,5	80,9
Disability at birth	141,037	171,109	4,5	4,9
Work related accident	10,971	71,589	0,3	2,1
Traffic accident	11,982	31,121	0,4	0,9
Domestic accident	3,256	5,526	0,1	0,2
Other accidents	8,666	20,550	0,3	0,6
War and Military Service	6,577	114,022	0,2	3,3
Others	243,854	252,113	7,7	7,2

**Table 1.3.2:** Causes of major disability. Source: Statistic of severely disabled persons 2003, Federal Statistical Office



In addition, the German National Health Interview and Examination Survey 1998 (BGS98) has shown that the likelihood of being affected by a severe disability rises for both men and women with advancing age and in relation to the number of illnesses they have had in the past. Men living in western Germany are statistically more likely to become disabled, whereas belonging to an upper stratum of society is related to a statistically lower risk [115].

**Orthopaedic and cardiovascular complaints are the most common causes of disability.** Functional damage to an internal organ is responsible for about 26 percent of cases of severe disability (women: 23 percent; men: 29 percent). Damage to the cardiovascular system, either alone or in combination with damage to other internal organs, is particularly common.

28 percent of severely disabled people suffer from a functional impairment of the extremities, the spinal column or the torso (women: 29 percent; men: 27 percent).

Looking at the statistics for the severely disabled in respect of the degree of disability (GdB), it can be seen that the group of those between GdB levels 50 and 60 constitute the majority. More women than men are affected at higher levels of disability (see Figure 1.3.11).

However, the levels of disability are not equally distributed. Persons with a GdB of 50 constitute the biggest group among the severely disabled, followed by the group with a GdB of 100. In every group a general illness (including cases of vaccination damage) was the main cause of disability.

**Congenital disabilities and accidents play a comparatively minor role.** According to data from 2003, 83.5 percent of all severe disabilities are caused by acquired diseases, compared to which the figures for innate disabilities (4.7 percent of all severe disabilities) and accidents (2.9 percent) are relatively insignificant (see Table 1.3.2).

There are notable differences between men and women in the case of disabilities caused by accidents: work-related accidents are 6.5 times, and road and travel accidents 2.5 times more likely to be the cause of severe disability in men than in women. This shows that both at work and in road traffic men are at significantly higher risk of becoming severely disabled than women.

**Old disabled people often live alone.** Of the 8.22 million disabled people living in private households, 29 percent live and manage alone in a one-person household. About half live in a two-person household and 21 percent in households of three or more. The size of the household varies widely according to the age of the affected person. In 2003 the great majority of disabled persons under the age of 45 were living in households of three or more persons; disabled people in the 55–79 age group were living mostly in two-person households; 75.2 percent of disabled women over the age of 80 and 26.2 percent of disabled men over 80 were living alone, a fact that points to the ability of disabled women to look after themselves, but also to the importance of the needs of elderly disabled women [114].

**Disabled people are less often employed than non-disabled people.** Employment opportunity is a crucial precondition of economic independence and the chance to participate in social life. However, 6.3 million of the 8.4 million disabled people living in Germany are unemployed and are not seeking employment. Just under 2.2 million disabled people (over 15) are in employment or seeking employment.

The labour-force participation rate, i.e. the percentage of the labour force that is in a given population group, is considerably lower among disabled people than among the non-disabled. In

May 2003 the labour-force participation rate was 21 percent for disabled women and 30 percent for disabled men, compared to 53 percent for non-disabled women and 71 percent for non-disabled men. The noticeable differences are partly the result of the different age structure that exists between disabled and non-disabled people. But even from an age-specific perspective, significant differences remain in the labour-force participation rate. Efforts to promote the participation of disabled people in working life are therefore an important part of the German Federal Employment Agency's employment policy. This includes the planning and introduction of individual integration strategies and services for promotional and integration measures for the workplace. The "Act for the Improvement of Training and Employment of Severely Handicapped Persons", which became law on 1 May 2004, is intended to improve and stabilize the employment situation of severely disabled people by encouraging employers to train severely disabled persons and to improve employment opportunities in small and medium-sized enterprises.

Analyses of the microcensus nonetheless show that disability allowances and pensions are the most important source of income for 66 percent of disabled people, followed by income from employment (18 percent) and financial support from relations (eight percent). Other sources of income such as social security (three percent) and unemployment benefit (four percent) play only a minor role.

**Chronic diseases and disabilities can be avoided by taking the right preventive measures.** In the area of healthcare services, measures of early detection, early treatment and early intervention contribute towards preventing disabilities or enabling early-stage treatment to ensure that those affected will be able to participate in all areas of social life. In addition to prevention, measures to support medical rehabilitation serve to counter the loss of participation in social life caused by disability. In 2003 the statutory health insurance carriers spent € 2.57 billion and the federal statutory pension fund € 3.5 billion on care and rehabilitation [116]. The Act for the Modernization of the Social Health Insurance System, which became law on 1 January 2004, took the interests of disabled people into consideration by creating new participation rights for patients and making changes in the healthcare structure. The German Social Security Code (section 2a of the SGB V) stipulates that the special needs of the disabled and chronically ill must be taken into account.

► A comprehensive presentation of the situation of disabled people is provided by **The Report of the German Government on the Situation of Disabled Persons and their Growing Participation** [116].

Type of Illness	ICD Category	Age
–	All illnesses	– Under 1
I	Certain infectious and parasitical diseases	
	Tuberculosis	A15–A19 5–64
	Post conditions of tuberculosis	B90 5–64
II	Neoplasms	
	Malignant neoplasms of the uterus Cervix	C53 5–64
	Hodgkin's Disease (Lymphogranulomatosis)	C81 5–34
IX	Metabolic diseases	
	Chronic rheumatic heart diseases	I05–I09 5–44
	High blood pressure (hypertension)	I10–I15 5–64
	Cerebrovascular diseases	I60–I69 5–64
XI	Digestive disorders	
	Diseases of the appendix	K35–K38 5–64
	Cholelithiasis (gallstones)	K80 5–64
	Cholecystitis (inflammation of the gall bladder)	K81 5–64
	Other diseases of the gall bladder	K82 5–64
	Other diseases of the urinary tract	K83 5–64
XV	Pregnancy, birth and postnatal confinement	O00–O99 15–49

**Table 1.3.3:** Preventable deaths (International Classification of Diseases ICD-10). Source: Federal Statistical Office

### 1.3.4 The need for nursing care

**Around two million people in Germany are in need of nursing care.** In 2003, 2.1 million people covered by public and private long-term nursing care insurance were recognized as being in need of long-term care. This figure corresponds to 2.5 percent of the population in Germany; the figure is expected to continue rising significantly up to 2040 due to the growing proportion of older people in the population.

The need for long-term care is overwhelmingly a matter of age and for the most part it applies to persons well advanced in years.

The proportion of men and women under 75 years of age in need of long-term care is under one percent. Above that age the proportion of people dependent on nursing care rises sharply: from 15.8 percent of 75- to 80-year-old women and 11.2 percent of 75- to 80-year-old men to 65.2 percent of women over 90 and 39.7 percent of men over 90. The difference between women and men becomes apparent from the age of 75 and widens continually after that.

One of the most common causes of the need for nursing care is dementia. In the over-80s age group, dementia of one kind or another accounts for more than 35 percent of the cases of persons in need of care [117].

**Most of those in need of nursing care are looked after at home.** Of the approx. two million recognized persons in need of nursing care, about 1.44 million are looked after at home and 0.64 million in nursing homes. Of those who are looked after at home, just under 57 percent are classified as Care Level I, almost 34 percent as Care Level II, and about ten percent as Care Level III. Those affected can choose between a home-care nursing service (allowance in kind) and care allowance. It is also possible to combine an allowance in kind with a financial allowance (combination benefit).

In nursing-care institutions the proportion of those in need of level I care is just under 34 percent, with around 44 percent at level II and about 21 percent at level III. Insured persons who

are cared for in a nursing home have the right to inpatient services which cover the time and money spent on normal care and (under a temporary transfer ruling) the costs of medical treatment and welfare. The persons in need of care must pay the costs of accommodation and catering themselves. In recent years there has been a slight move in the direction of professional and inpatient care [117].

**In three out of four cases it is a woman who is nursing a relative at home.** Those cared for at home are for the most part not professionally cared for, but looked after by a member of the family, usually by the next of kin. In 28 percent of cases it is a spouse, in 26 percent of cases a daughter, 12 percent a mother and 10 percent a son: 73 percent of caregivers are women; 60 percent of the main caregivers are already 55 years or older. This shows that most of private caregiving is carried out by someone of the same generation.

Family caregivers are often in employment: 19 percent of the main caregivers of working age (15 to 63 years old) are in full employment; 21 percent have a part-time job or have minimal employment contracts; 60 percent are not in employment.

In principle, 64 percent of the main caregivers have to be available around the clock. On average they dedicate 36.6 hours a week to assistance, care and minding in the broadest sense of the words. Consequently, 41 percent of them describe the burden of their duties as “very heavy” and 41 percent as “rather heavy”. Ten percent feel they are “not greatly burdened”, and only seven percent feel they are not burdened at all. In fact, a burdensome home-care situation can have negative emotional, psychological, social, financial and physical consequences for the caregiver [118].

Added to this is the fact that private caregivers can seldom fall back on official counselling or support. Just seven percent of them alternate as caregivers regularly with professionals, and 14 percent do so occasionally; 16 percent will have taken part in a specialist course for caregivers. In view of the increasingly important role that private caregiving may be expected to play in the years to come, the extent of professional support for caregivers in the family should be increased [119].

► Comprehensive Information can be found in the Federal Health Reporting focal theme report: **Nursing Care** [117].

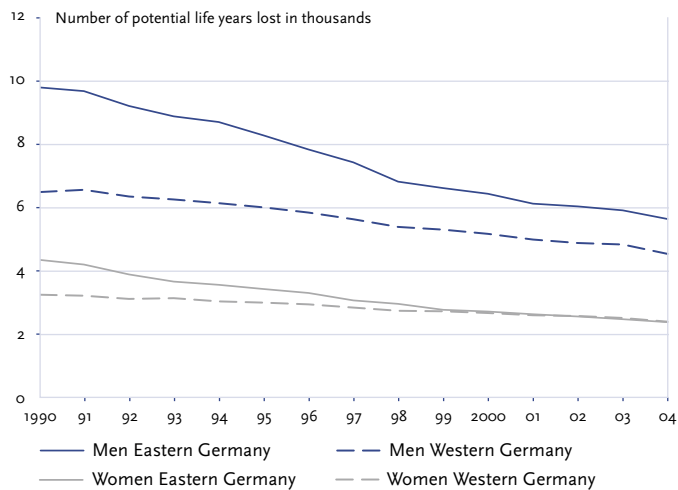
#### Definition

As defined by the Long-Term Nursing Care Insurance Act, persons are in need of care if, “because of a physical, mental or psychological illness or disability, they are to a considerable or high degree in ongoing need for at least six months of a considerable or high degree of assistance in the carrying out of tasks which are usual and recur regularly in the course of everyday life” (SGB XI, section 14). Different levels of required care are identified when determining the level of help needed and the allocation of insurance benefit.

Care Level I (“considerable need of care”) applies when a person requires nursing assistance at least once a day for at least two aspects of basic self-care, and help in the household several times a week. The total time required must be at least ninety minutes, and more than 45 minutes of this must be accounted for by basic nursing-care needs.

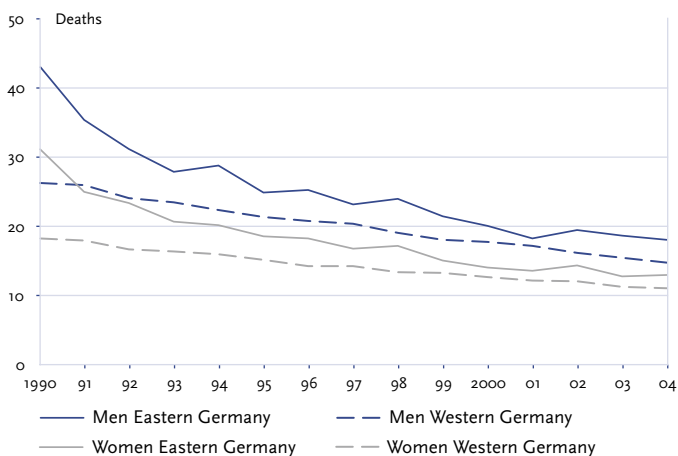
Care Level II (“very considerable need of care”) applies when a person requires nursing assistance in aspects of basic self-care at least three times at different times during the day, and help in managing the household many times a week. The total time required must be at least three hours, and at least two hours of this must be accounted for by basic nursing-care needs.

Care Level III (“most comprehensive need of care”) applies when a person requires nursing assistance in aspects of basic self-care every day and round the clock, including nights, and help in managing the household many times a week. The total time required must be at least five hours, and at least four hours of this must be accounted for by basic nursing-care needs.



**Figure 1.3.12:** Life years lost through death before reaching the age of 70, age-standardised ("old" European population basis), and excluding statistics for children under one year.

Source: Cause-of-death statistics, Federal Statistical Office



**Figure 1.3.13:** Avoidable deaths per 100,000 inhabitants.

Source: Cause-of-death statistics, Federal Statistical Office

### 1.3.5 Lost years of life

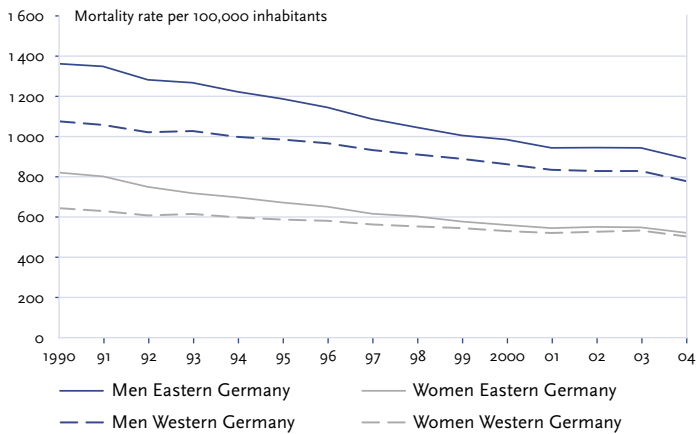
**The number of lost years of life is falling.** Cancers are the most important cause of loss of potential years of life in both men and women. Ranking two and three in the statistics are cardiovascular diseases and so-called external causes such as accidents and suicides. Among women, cardiovascular diseases rank second and external causes rank third; in men it is the other way round.

The total number of years of life lost has been falling since 1990 among both men and women. The decline is more noticeable in eastern than in western Germany. While there are no significant differences between east and west as far as women are concerned, men from eastern Germany are still worse off than those in the west (see Figure 1.3.12).

Neoplasms and external circumstances continue to be of particular significance and the most common cause of premature death among men under 70 years of age in both eastern and western Germany. In eastern Germany, 1,394 potential years of life were lost through neoplasms and 1,327 through accidents for every 100,000 men in 2004. In western Germany, the rate was 1,219 years (neoplasms) and 989 years (accidents) per 100,000 men respectively. Cardiovascular diseases also lead a high number of men to a premature death in both the eastern and western Germany.

#### Definition

In cases where death occurs before the seventieth year, Potential Years of Life Lost (PYLL) indicate the difference between the age at death and 70. The countries represented in the OECD and the WHO have agreed to regard death between the ages of one and 69 as atypical. As a rule, cases of premature death are presented in terms of the number of years of life lost per 100,000 people. In this sense, years of life can be lost as a result of a lower quality of life or an adverse lifestyle as well as through inadequate prevention or therapy.



**Figure 1.4.1:** Trend of the age-standardised mortality rate (“old” European population basis). Source: Causes-of-death statistics (2004), Federal Statistical Office

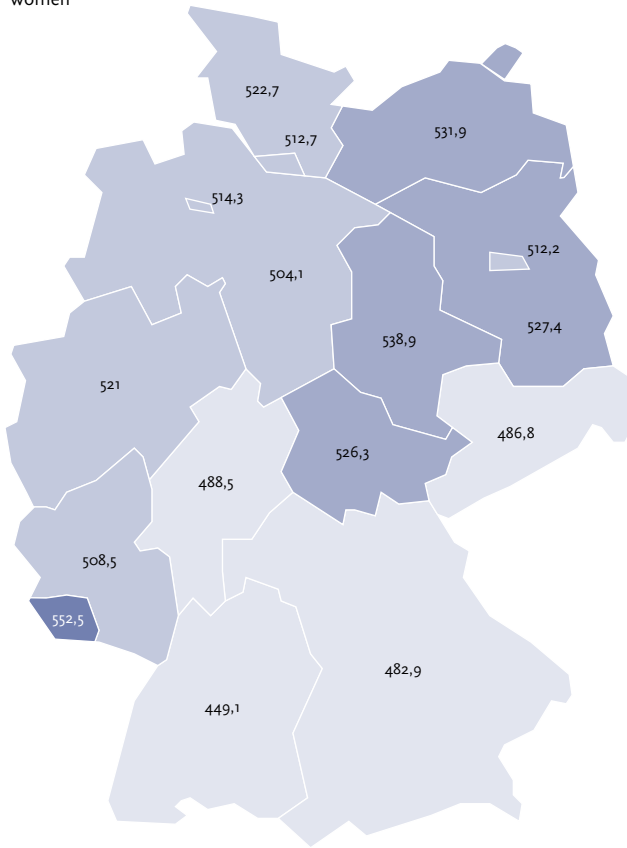
### 1.3.6 Preventable deaths

**The number of preventable deaths is falling.** The number of preventable deaths has been falling since 1990, while the rates for eastern and western Germany have continued to converge (see Figure 1.3.13). However, particularly in the case of men, it can be seen that more preventable deaths still occur in eastern than in western Germany.

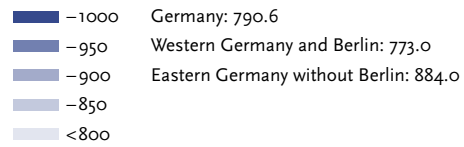
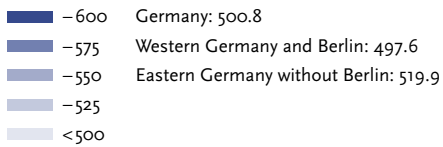
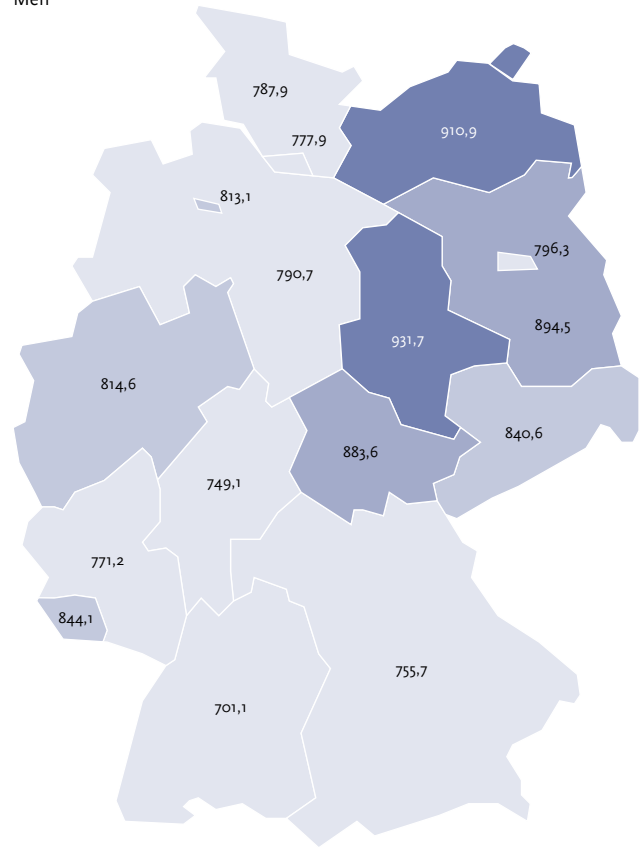
#### Definition

Preventable deaths are defined here as deaths that could have been prevented by appropriate preventive measures or therapy. Broadly speaking, the key figures on preventable deaths follow the concept of the Expert Advisory Council for Concerted Action in Health Care, which defines specific causes of death in given age groups as preventable (see Table 1.3.3). The number of preventable deaths is given as a figure relative to 100,000 people.

Women



Men



**Figure 1.4.2:** Age standardised mortality rates (“old” European population basis) in the German Federal states in 2004. Source: Causes-of-death statistics, Federal Statistical Office

## 1.4 Mortality rate

### ► Abstract

General mortality rates fell continually between 1990 and 2004. The ratios between the main causes of death did not change significantly during that period. Cardiovascular diseases and cancers caused the most deaths among men and women. The two causes of death together were responsible for 69.3 percent of male deaths and 73 percent of female deaths in 2004. It is worth noting that death caused by injuries is about twice as frequent among men (5.4 percent) as among women (2.9 percent). Mortality rates relating to cardiovascular diseases, injuries and poisonings are falling sharply in both sexes, but nervous diseases and endocrine-system diseases (hormonal diseases) have been gaining in importance in men and women. Infections and nervous diseases play a bigger role now than they did in 1990. Infant mortality also declined in the 1990s. The infant mortality rate is now lower in eastern than in western Germany. The nationwide average of 4.1 deaths per 1000 live births is one of the lowest mortality rates in the EU.

### 1.4.1 Mortality rates in eastern and western Germany

**The mortality rate has fallen even faster in eastern Germany than in the west.** The overall mortality rate in Germany fell appreciably among both men and women between 1990 and 2004 (see Figure 1.4.1). In men, the age-standardized mortality rate fell from 1119.2 to 790.6 deaths per 100,000 people. Among women it went down from 670.1 to 500.8 deaths per 100,000 people.

In eastern Germany this corresponds to a 34.8 percent decline in mortality rates among men and a 36.7 percent fall for women. In western Germany, however, the mortality rate fell by 27.7 among men and by 22 percent among women. Owing to the sharp decline in eastern Germany, the mortality rates in east and west have continued to converge, especially among women.

The smallest difference in mortality rates between eastern and western Germany is among persons under 15 years of age. Rates for this age group are practically identical in east and west. The biggest difference is among men under the age of 65. In this age group the mortality rate in 2004 was 20 percent higher among east German men than their counterparts in the west. For the over-65-year-olds, the difference was 12 percent. The mortality rate among east German women under 65 was five percent below the rate for west German women of the same age. The picture was reversed among the over-65-year-olds with a six percent higher mortality rate among east German women compared to west German women.

More men die in eastern than in western Germany of cardiovascular diseases, digestive diseases, neoplasms, endocrine (hormone), dietary and metabolic diseases, as well as injuries and poisonings; in western Germany, by contrast, more men

are killed by infectious diseases, bronchial disorders and diseases of the urinogenital system.

The differences between east and west are less marked for women overall. Nevertheless, in a number of diseases female mortality rates are higher in eastern than in western Germany. These include cardiovascular diseases, endocrine (hormone), dietary and metabolic diseases, digestive diseases, injuries and accidents, whereas in western Germany more women die frequently of neoplasms, infectious diseases and bronchial diseases.

Mortality rates differ not only between east and west but also from one federal state to another. Baden-Wurtemberg has the lowest figure with 449.1 deaths per 100,000 people; Saarland has the highest with 552.2. Baden-Wurtemberg also has the lowest mortality rate among men (701.1 deaths per 100,000 people); the highest figure (931.7) is reported in Saxony-Anhalt (see Figure 1.4.2).

### 1.4.2 Frequent causes of death

**The number of fatal cardiovascular diseases, accidents and injuries is falling.** The mortality rate from cardiovascular diseases and so-called external causes declined significantly in Germany between 1990 and 2004. The external (non-natural) causes of death include injuries, poisonings, accidents and suicides. The mortality rate from cardiovascular diseases fell by 38.2 percent among men and by 33.1 percent among women between 1990 and 2004. The rate from external causes declined among men by 32.7 percent and among women by 40.1 percent, whereas cancer mortality was down only 15.8 percent for women and 18.7 percent for men.

Deaths from diseases of the nervous system and the sense organs increased in the same period, by 10.1 percent among women and 13.2 percent among men. The mortality rate from endocrine (hormone) diseases, dietary and metabolic diseases rose among men (12.7 percent); deaths from a number of infectious and parasitical diseases rose among women, but this was of little statistical significance.

The total mortality rate (including all diagnoses) declined in Germany between 1990 and 2004 by 25.3 percent among women and by 29.4 percent among men.

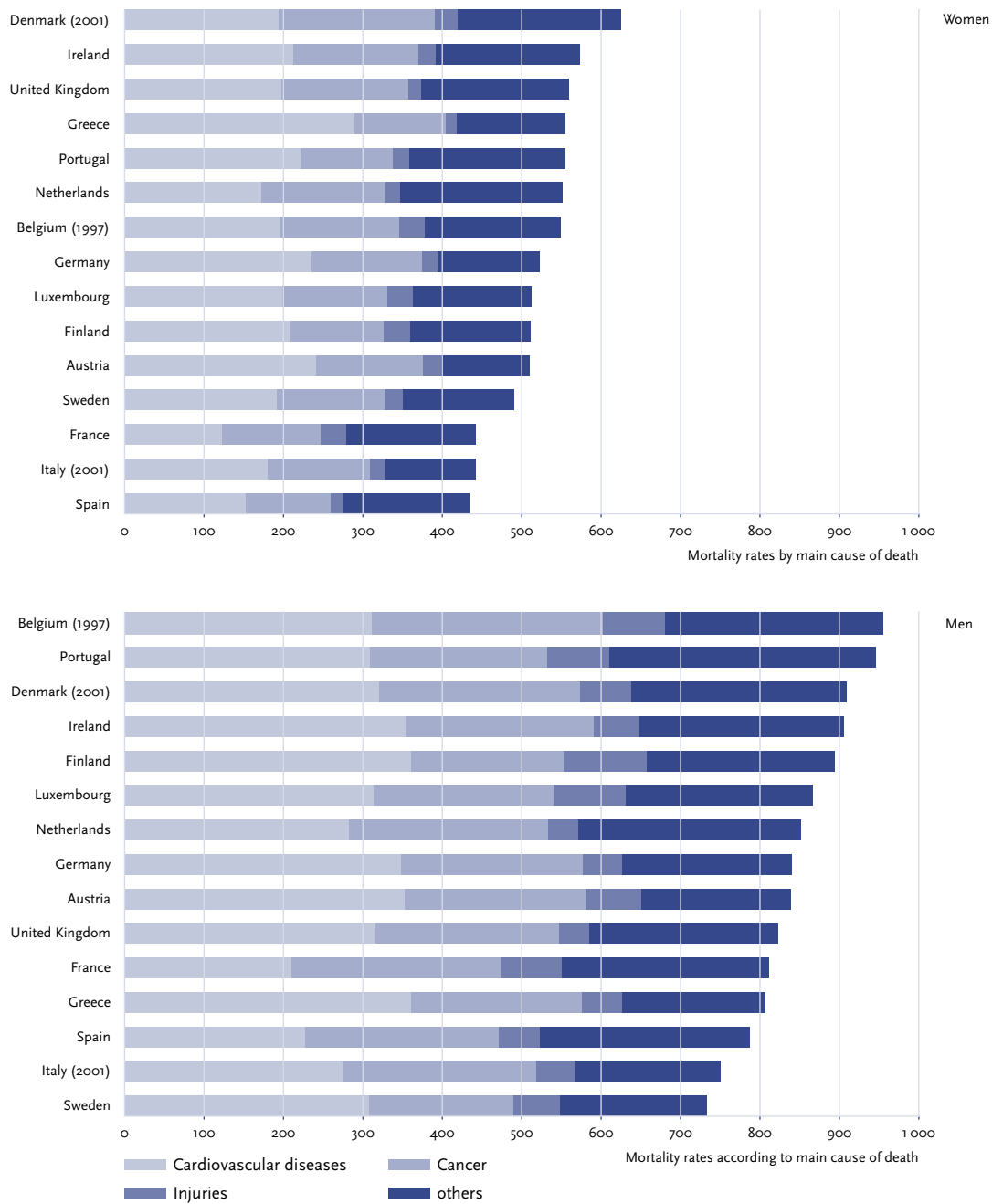
**Coronary disease, stroke, lung and breast cancer head the mortality statistics.** The causes of death, classified according to an individual diagnosis, are published every year by the Federal Statistical Office. In both 1990 and 2004, cardiovascular diseases, breast cancer, bowel cancer and diabetes were among the most common causes of death in women (see Table 1.4). In men, cardiovascular diseases, lung and prostate cancer, chronic bronchial diseases, alcohol-related liver damage and (since 1992) bowel cancer were recorded as the main causes of death in both years. There has been a remarkable development in the case of lung cancer among women (by contrast to men). Since 1990 the lung-cancer mortality rate in women has risen by 48 percent, making this disease a major factor.

### Methodological commentary

The classifications of some individual diagnoses have changed as a result of the switch from the ninth to the tenth version of the International Classification of Diseases (ICD-9 to ICD-10). This makes a chronological compari-

son of causes of death more difficult. For this reason the so-called European Short List of important causes of death has been brought into being by Eurostat, the EU Office of Statistics, and the Task Force on Cause-of-Death Statistics. The list, which has been approved by all

member states of the European Union, makes it possible to accurately compare all the currently available ICD versions. It covers 65 diagnoses and diagnosis groups which are of particular importance in EU mortality rates.



**Figure 1.4.3:** Causes of death by major diagnostic groups, A comparison of the EU-15 countries Source: HFA Database, WHO January 2006



Women	Rank 2004	Mortality rate
I25 Chronic ishemic heart disease	1	114.7
I50 Cardiac insufficiency	2	78.6
I21 Acute myocardial infarction	3	67.3
I64 Stroke, not specified whether haemorrhage or infarction	4	50.0
C50 Malignant neoplasm of the mammary glands)	5	41.7
I11 Hypertensive heart disease	6	27.2
C34 Malignant neoplasm of the bronchia and lungs	7	26.1
J18 Pneumonia Cause not specified	8	24.7
C18 Malignant neoplasm of the colon	9	24.4
E14 Diabetes mellitus (no specification)	10	23.1
Men	Rank 2004	Mortality rate
I25 Chronic ishemic heart disease	1	88.8
I21 Acute myocardial infarction	2	82.6
C34 Malignant neoplasm of the bronchia and lungs	3	71.3
I50 Cardiac Insufficiency	4	37.3
J44 Other chronic obstructive pulmonary diseases	5	29.2
I64 Stroke, not specified whether haemorrhage or infarction	6	27.6
C61 Malignant neoplasm of the prostate	7	27.6
C18 Malignant neoplasm of the colon	8	22.7
J18 Pneumonia. Cause not specified	9	19.8
K70 Alcohol-related liver disease	10	18.5

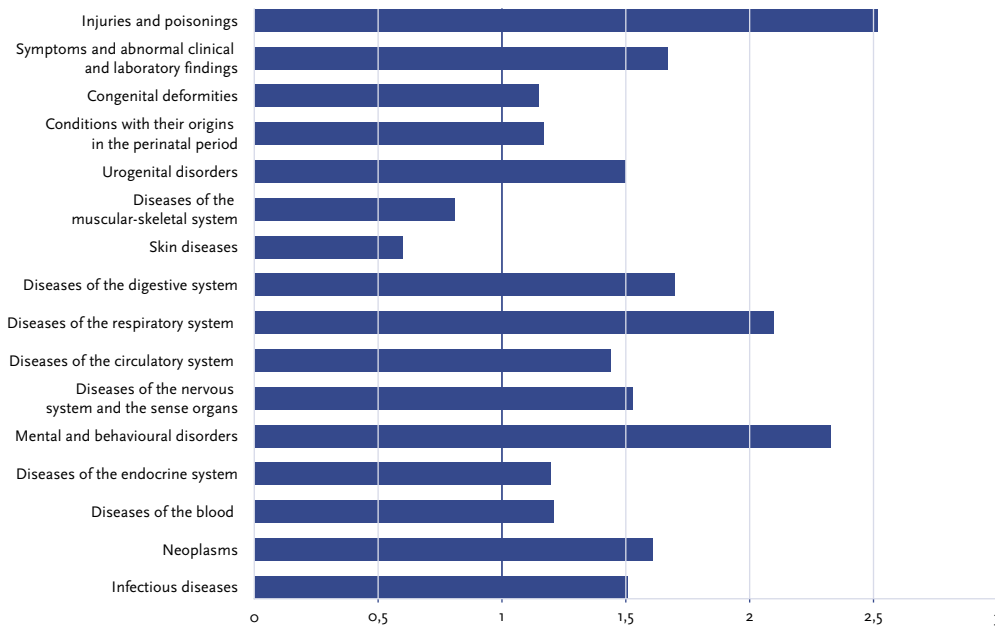
**Table 1.4:** Most frequent cause of death per 100,000 inhabitants in 2004 (all age groups, not standardised)

Since 2000 lung cancer has been one of the ten most frequent causes of deaths among women.

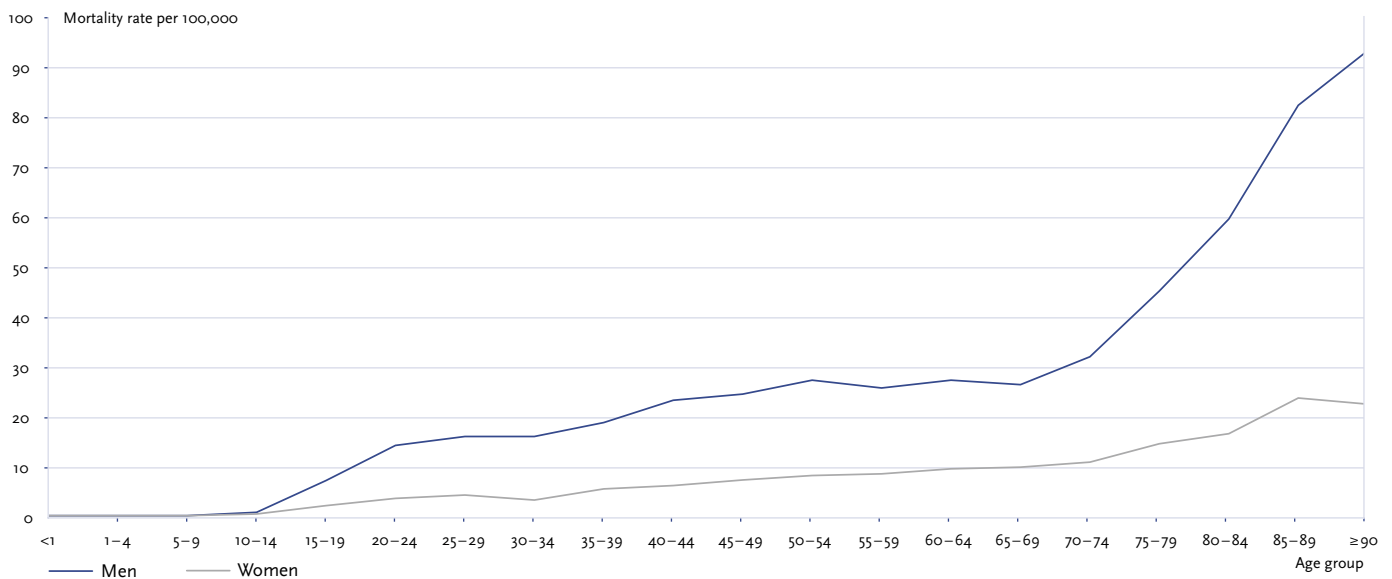
The effect of pneumonias has increased since 1998, making this disease one of the main causes of death in both men and women. By contrast, stomach cancer, which was one of the ten most common causes of death in both men and women in 1990, has declined by about 47 percent in both sexes. Stomach cancer has not counted statistically as a major cause of death since the 1990s.

**Young adults die mostly as a result of accidents and injuries.** Injuries and accidents are the main cause of death among adolescents and young adults between the ages of 15 and 25, accounting for almost 70 percent of male deaths and nearly 50 percent of female deaths in this age group. With increasing age, cardiovascular disease gains in importance among men and women. Cancers play a leading role in the statistics for both sexes, especially among women between the ages of 45 and 65 and men between 55 and 75. The main cancers that fatally affect men and women in this age group are lung cancer and breast cancer respectively.

**German mortality rates are near the average for the whole of Europe.** Germany's overall mortality rate for both men and women ranks 8th among the EU-15 (see Figure 1.4.3). The mortality rate from cardiovascular diseases is lowest among French men and women and highest among Greek men and women. The lowest cancer mortality rates are among Spanish women and Swedish men, the highest among Danish women and Belgian men. Greek women and Dutch men are the least likely to die from injuries and poisoning and other external circumstances. Finnish men and women are the most likely to die of these causes.



**Figure 1.4.4:** Age-standardised Sex-specific relation of mortality in 2004 by selected disease groups ("Old" European population basis, Women = 1). Source: Causes-of-death statistics 2004, Federal Statistical Office



**Figure 1.4.5:** Mortality rate for suicides in 2004 (ICD-10: X60 - X84). Source: Causes-of-death statistics 2004, Federal Statistical Office

### 1.4.3 Gender-specific mortality rates

#### **Men live more risk-prone lives and have a higher mortality rate.**

Men have a higher mortality rate than women. Comparing rates for the two sexes shows that more than twice as many men as women die of certain causes (see Figure 1.4.4). Among the diagnosis categories with a particularly high male excess mortality rate are mental and behavioural disorders including the use of psychotropic substances, injuries and poisonings, accidents, suicides and bronchial diseases.

The main factors responsible for the higher mortality rates among men from digestive diseases and cancers are chronic liver damage and lung cancer. This is largely explained by the fact that men tend to have a riskier lifestyle than women, with a higher rate of tobacco and alcohol consumption. Taken together the gender-specific mortality profile points to a greater willingness among men to take risks in the way they use their bodies and to a higher element of risk in their working environment [120].

**Elderly men in particular are more likely to commit suicide than women of the same age.** 7,939 men took their own lives in 2004 as opposed to 2,794 women. The difference between men and women in suicide rates applies to all age groups but is especially marked in people over the age of 75 (see Figure 1.4.5).

Although just under three times as many men as women actually commit suicide, the exact ratio being 2.8:1 (2.8:1 in western Germany, 3:1 eastern Germany), two-thirds of all suicide attempts are made by women. There are no reliable statistics, however. There are probably a large number of undisclosed cases, and experts disagree as to what should actually be defined as suicide. In the 15–24 age group the proportion of women attempting suicide is thought to be especially high.

There is a disturbingly high suicide rate among older men, possibly owing to a lack of social support for men in this age group [120]. The suicide rate also rises among women over the age of 85. People with depression, untreated alcoholics, people on medication, drug addicts and the incurably ill are the most prone to suicide.

**Alcohol kills more men than women.** There are also gender-specific differences in cases of mortality where alcohol plays a role. Psychic and behavioural disorders caused by alcohol – e.g. alcohol addiction and alcohol poisoning (ICD-10: F10) or alcoholic liver disease (ICD-10: K 70) – are typical of such differences. In 2004 these two diagnoses were recorded as the cause of death in 11,213 men, but only in 3,815 women.

The gender-specific mortality ratio for alcohol-induced mental and behavioural disorders was 3.7:1 (western Germany 3.3:1, eastern Germany 6.6:1). For alcohol-induced liver damage the ratio was 2.7:1 (western Germany 2.4:1, eastern Germany 3.6:1) (see Figure 1.4.6).

Mortalities from alcohol-induced diseases among men are twice as high in eastern as in western Germany. The difference is not so marked for women, but here too the rate is higher in the east than in the west. According to the data of the German National Health Interview and Examination Survey 1998, 31 percent of men and 16 percent of women drink an average quantity of alcohol per day which is above the health limit of 20 grams of alcohol a day for men and ten grams for women [121]. Working on the basis of this limit, a third of all men in Germany and a sixth of all women consume alcoholic beverages at a level that increases risks to their health. The pronounced level of alcohol consumption among men is explained by cultural and social role-playing factors, characterized on the one hand

by the suppression of emotions and on the other by acting out aggression, control, power and domination [122].

### 1.4.4 Infant mortality

**Infant mortality fell throughout the 1990s.** Infant mortality in Germany fell throughout the 1990s, reaching a rate of 414 deaths per 100,000 live births in 2004 (see Figure 1.4.7): the rate was slightly higher for boys (450 per 100,000) than for girls (375). A total of 2,918 infants died in Germany in 2004, of whom 1,629 were boys and 1,289 girls.

The decline in infant mortalities between 1990 and 2004 corresponds to a fall in the mortality rate of 41 percent (eastern Germany excluding east Berlin: 46 percent; eastern Germany including east Berlin: 40 percent).

**The infant mortality rate in Germany is below the EU average.** The infant mortality rate in what was then West Germany in the 1960s was significantly higher than that of most western industrialized countries, but it began to fall in the 1970s due to obstetric examinations, improved pregnancy counselling, and an improved detection rate of disorders in infancy.

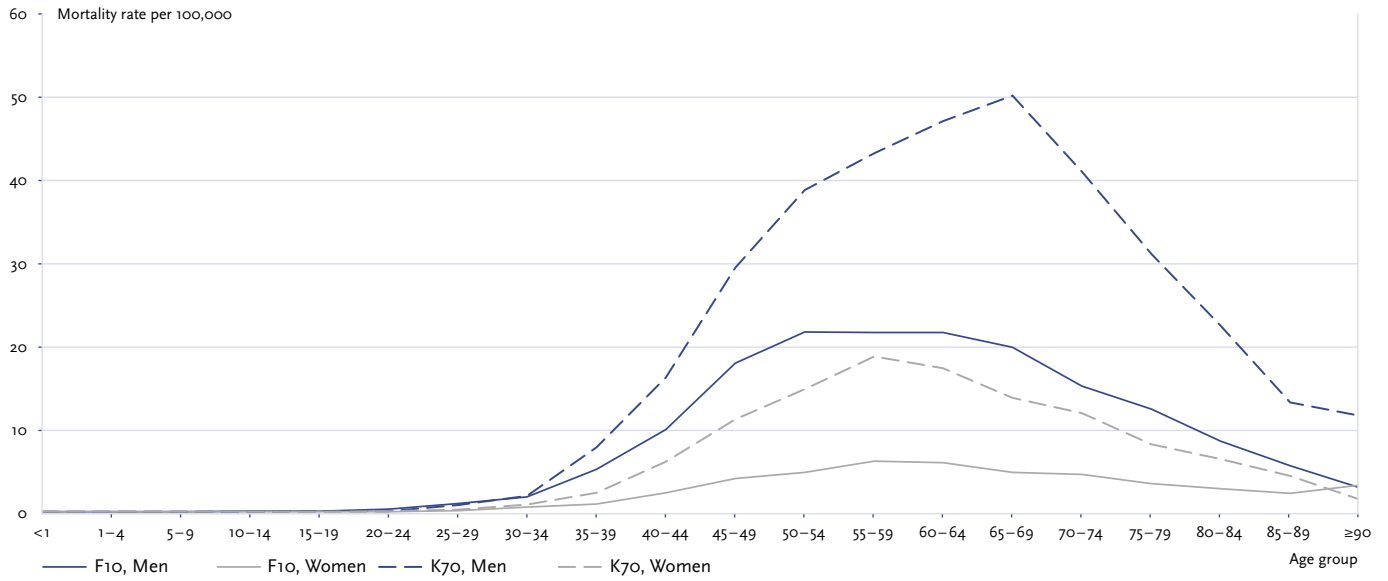
The infant mortality rate in Germany is now in the lower third among European countries (see Figure 1.4.8). Spain, Sweden and Finland have even better rates. According to the latest figures, early, late and post-neonatal infant mortality rates are below the EU-15 average.

**Apart from gender, social factors influence the infant mortality rate.** The general fall in infant mortality has reduced the difference in mortality rates between individual groups of the population. Statements at birth about the legitimacy, citizenship and sex of the child is the only information that may be obtained.

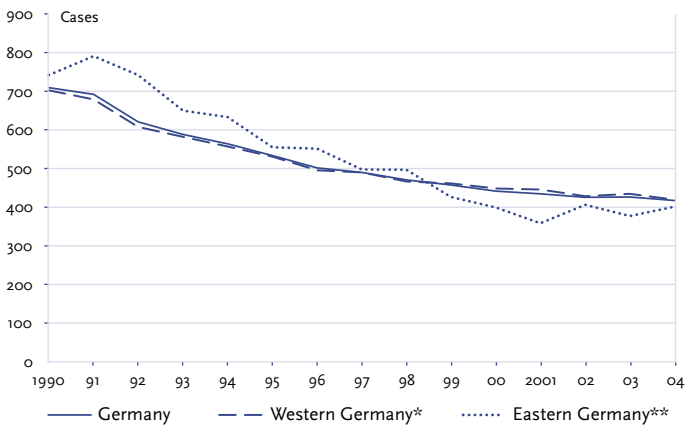
In 1995 in Germany the mortality rate of illegitimate children was nearly double that of the total average. Foreign and male infants had a higher mortality rate, albeit not as marked as in the case of illegitimate children.

In 1995 total mortalities per 100,000 live births amounted to 640 among illegitimate children and 510 for legitimate children. As regards citizenship, the number of mortalities among non-German children was 650, as opposed to 510 among German children; with respect to gender, 590 male and 460 female infants died per 100,000 live births [125].

Differences of citizenship and gender still exist, but they are not as marked as they used to be. In 1999, 540 non-German and 440 German infants died per 100,000 live births. The difference in mortality rates between genders is even smaller: in



**Figure 1.4.6:** Mortality rate from mental and behavioural disorders as a result of alcohol and alcohol-related diseases of the liver in 2004 (ICD-10: F 10 and K 70). Source: Causes-of-death statistics 2004, Federal Statistical Office [102]



\* and East Berlin  
 \*\* excluding East Berlin

**Figure 1.4.7:** Trend of infant mortality rate per 100,000 live births classified by Eastern and Western Germany. Source: Vital statistics, Federal Statistical Office [123]

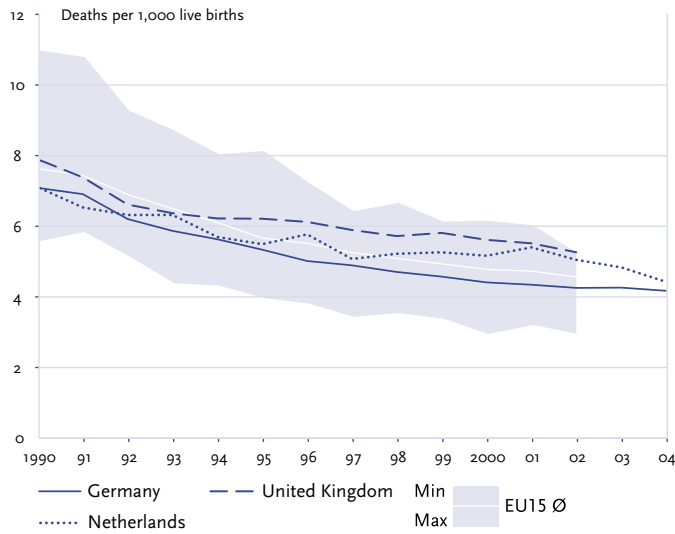


Figure 1.4.8: Evolution of infant mortality rates-a European comparison. Source: HFA Database, WHO January 2006 [124]

2004, 450 male and 375 female infants died per 100,000 live births.

As far as legitimacy is concerned, the ratios have actually been reversed compared to 1995. In 2004, 237 illegitimate and 482 legitimate infants died per 100,000 live births. The infant mortality rate also varies from one federal state to another. The rate of infant mortality in 1990 was lowest in Hamburg and Bavaria, and highest in Berlin and Rhineland-Palatinate. In 2004, the lowest rates were recorded in Saxony, Bavaria and Baden-Württemberg, the highest in North Rhine-Westphalia and Thuringia. The overall infant mortality rate declined in all the federal states between 1990 and 2004 (see Figure 1.4.9).

**Premature babies that are underweight frequently die in the first week of life.** Premature birth and (often related) underweight increases the risk of mortality among newborn children. About three quarters of mortalities among newborn children weighing less than 1000 grams and about half of mortalities among children between 1000 and 2500 grams take place within a week of delivery [126]. Underweight and premature birth can be aggravated by cigarette and alcohol consumption during pregnancy and by not having the first prenatal examinations.

**Sudden infant death is occurring less frequently and is nearly always preventable.** Sudden infant death syndrome (SIDS), refers to the unexpected death of a completely healthy infant, whose death cannot be explained by his/her medical history, external circumstances, or a comprehensive autopsy. Sudden infant death occurs principally between the 28th day and the end of the first year of life and is particularly frequent between the second and fourth month. It is frequently preceded by harmless bronchial disorders. The number of sudden infant deaths rose in the 1980s in western Germany both in numbers and as a proportion of the total infant mortality rate. With 1,283 cases in 1990 (1.4 cases per 1000 live births) sudden infant death was responsible for a fifth of all infant mortalities in that year. In 1995, at 751 mortalities the ratio in Germany was 1:1000 live births and has since fallen to 323 cases (about 0.5:1000) in 2004. Information and prevention campaigns have contributed decisively to reducing the number of sudden infant deaths.

According to various studies, more sudden infant deaths occur among mothers who belong to the lower class, are young, or had had another baby a short time previously. The risk is about 50 percent higher for male than for female infants (SIDS cases in 2004: 200 boys, 123 girls).

There is no doubt that sudden infant death occurs more often when a child sleeps on its stomach or is too warm, and when the mother smokes during pregnancy or near the child. In accordance with international guidelines, the German Acad-

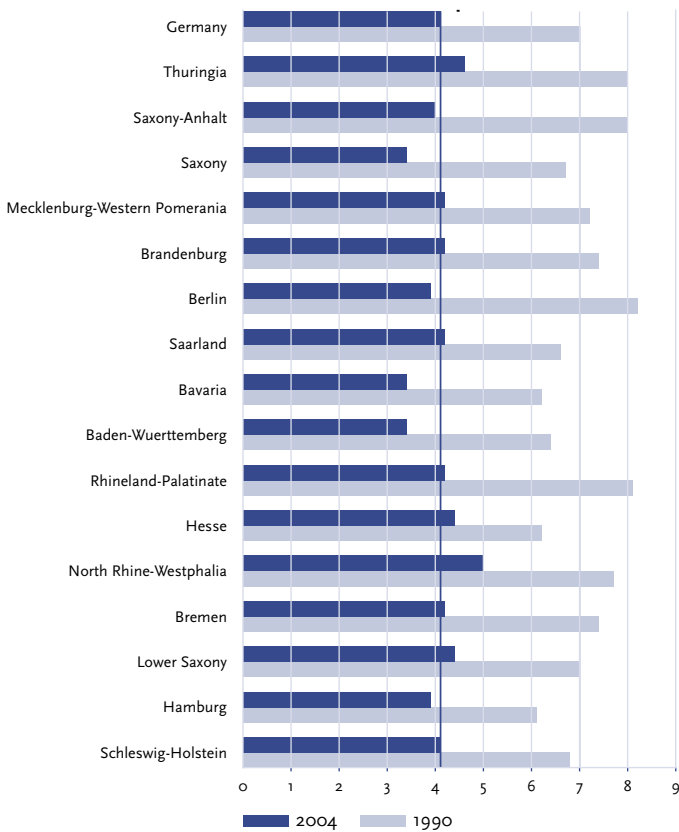


Figure 1.4.9: Trend of infant mortality by region. Source: Vital statistics, Federal Statistical Office [123]

**Definition**

The infant mortality rate indicates the number of children who die in their first year of life. It is an important indicator of the prevailing general standard of life and quality of medical healthcare. The infant mortality rate is usually given as the number of mortalities per 100,000 or per 1000 live births.

The early-neonatal mortality rate in infants is the mortality rate among newborns within the first week after delivery. It mainly affects children who are born prematurely and underweight, who are born with dysplasia or suffer from the results of complications in pregnancy and birth. The late-neonatal mortality rate is defined as the mortality rate of newborns between the ages of seven and 27 days.

The post-neonatal mortality rate is the mortality rate of infants who die between 28 and 364 days after birth.

emy of Paediatrics and Adolescent Medicine has recommended that infants in the first year of life should sleep on their backs, lie in bed in such a way that the head cannot be completely covered, sleep in their parents' bedroom but in their own bed, grow up in a smoke-free environment, and that the room temperature and bed covers should be chosen so as to ensure that it is pleasant for the child, in other words neither too hot nor too cold.

Experience around the world has shown that these measures are enough to almost entirely prevent sudden infant deaths [127], and in the Netherlands there are now only 0.1 cases of sudden infant death per 1000 live births.

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**Key statements**

- ▶ Over 13 percent of the population in Germany are at risk of poverty. (Page 83)
- ▶ A socially disadvantaged position is a predisposing factor for, inter alia, strokes, bronchial complaints, back pains and depression. (Page 85)
- ▶ One in every ten Germans feels very adversely affected by traffic noise. (Page 91)
- ▶ In Germany about 20,000 people die and over eight million are injured in accidents every year; most accidents occur at home or during leisure time. (Page 93)
- ▶ Dairy products and bread are by far the most important sources of nutritional energy for Germans. (Page 97)
- ▶ About a third of adults practise no sports whatsoever. (Page 103)
- ▶ Every third person in Germany smokes and almost every tenth person is a heavy smoker. Almost one child in two is a passive smoker. (Page 107)
- ▶ Alcohol is at least a partial cause of about 40,000 fatalities every year. (Page 109)
- ▶ Half of 16- to 19-year-olds get drunk at least once a month. (Page 111)
- ▶ The cholesterol level of one in every three adults is too high. (Page 117)

## 2 What factors affect health?

### ► Abstract

Social situation, level of education, individual lifestyle, levels of environmental stress and pollution all considerably influence the individual health and life expectancy of people in Germany. Unemployment and a life threatened by poverty, little awareness of what is and what is not healthy, air and noise pollution, the consumption of tobacco and alcohol – all these factors have an impact, along with unhealthy diets and eating habits, a lack of physical activity, overweight, high blood pressure and lipometabolism disorders. These factors play a major role in disease development, especially in chronic diseases; at the same time they present a point of departure for combating diseases and promoting health.

Taken together, the various factors at work create a heterogeneous picture. Some recent trends in the health field are positive and some negative, but general living conditions in Germany have improved continuously over the last few decades. On the other hand, consistently high rates of unemployment, problematic economic conditions and prospects tend to increase inequality and poverty risk. For the unemployed, people depending on social security, single mothers and children growing up in circumstances which could easily turn into outright poverty, the chances of enjoying good health are hardly very favourable.

Similarly, any evaluation of the important environmental influences which have an impact on health and well-being has to take into account negative as well as positive aspects. Generally speaking, environmental pollution has been reduced, due to numerous statutory regulations. Yet many large German cities did not meet the particulate matter limit value (PM<sub>10</sub>) in 2005. Indoors, the impact of passive smoking on children's health continues to play an important role. Furthermore, part of the German population suffers from continuous noise pollution that is severe enough, for example, to increase the risk of cardiovascular disease.

Despite considerable progress in combating accidents over the last few decades, accidents still rank first in the mortality statistics of 18- to 25-olds.

Dietary habits in Germany have improved in some respects. Today people consume more fruit and vegetables, more fibre and carbohydrate-rich foods and more non-alcoholic drinks than in the 1980s. In this respect, women eat and drink more healthily than men. Contrary to this trend, however, the consumption

of convenience food, fast food and food supplements has been rising. Although a typical German diet contains sufficient quantities of most vitamins and mineral nutrients, some sections of the population still suffer from deficiencies of vitamin E, vitamin D, folic acid, iodine and calcium. Furthermore, there are still clear deficits in terms of physical activity.

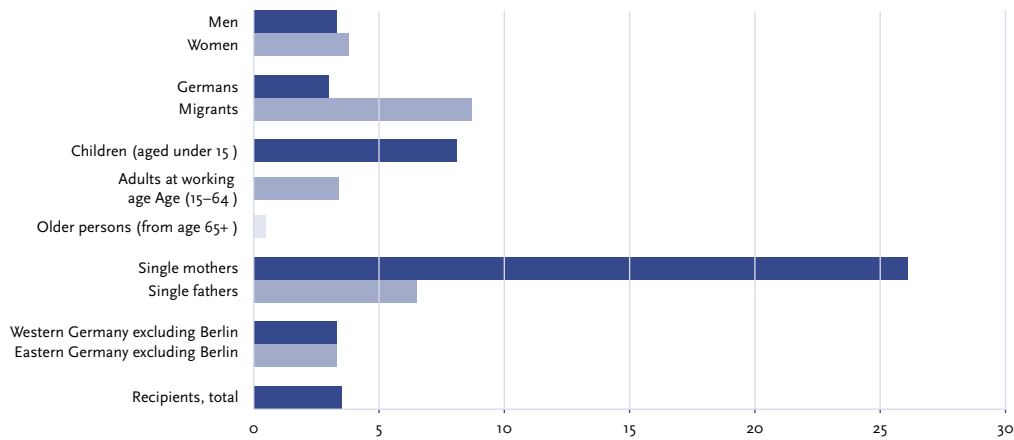
Although part of the population became physically more active in the 1990s, many people still do not get enough exercise in their day-to-day activities. Among other factors, this can be related to an increase in sedentary activities and more consumption of mass media during leisure time.

Equally detrimental to health is cigarette smoking, which remains one of the most significant health-risk factors in Germany. Differences between the sexes with respect to smoking have been diminishing; tobacco consumption among men has declined slightly in recent years, while it has been rising among women.

Alcohol consumption also plays a major role. One third of men and almost a sixth of women consume alcoholic drinks in quantities that increase the risk to their health.

The drinking patterns of young people are particularly alarming, with more of them becoming binge drinkers. Risk factors such as overweight, high blood pressure and lipometabolism disorders are characteristic of certain lifestyles. About a third of women and half the men in Germany are overweight, with overweight, and especially obesity, becoming more frequent with advancing age. Socially disadvantaged population groups are especially affected in this respect.

Although many of the major factors influencing sickness and health are known today and explain a number of general health trends in Germany, in individual cases it remains unclear why some people live a healthy and active life into old age while others develop severe illnesses at an early stage of their lives. Clearly, interindividual differences play a decisive role in this context. Genetically determined predispositions relating to high blood pressure and obesity, for example, may play a decisive role in the development of these conditions. However, there are hardly any reliable data available for Germany at the moment. It is therefore also impossible to determine exactly what role certain character traits such as aggressiveness, self-satisfaction or optimism may play in this context. Yet these are all possible contributory factors which determine the health and quality of life of people in Germany.



\* Recipients of social assistance benefits outside institutions on 31. 12. 2004. Source: Federal Statistical Office: Press Release [5] and subject-matter series 13/Sub-series 2.1 [6]

**Figure 2.1.1:** Rates of social welfare\* recipients in Germany at the end of 2004 by different population groups (as percentages of each respective group)

## 2.1 Social situation and health

### ► Abstract

The general standard of living, average incomes and education levels have risen continually in Germany over the past decades. At the same time, difficult economic conditions and a persistently high unemployment rate have tended to result in greater inequality and increased risks of poverty. The percentage of people depending on social security has risen from below one percent in the early 1960s to over three percent in 2002. The number of those living under the threat of poverty has also risen. At present, an average of 13.5 percent of the population are exposed to a high risk of poverty, while the figure is higher for children and adolescents and lower for elderly people over the age of 65.

Socially disadvantaged groups are exposed in some respects to a considerably higher risk of illness due to greater strains in working life, poorer living conditions, higher cigarette consumption, a greater risk of being overweight and less physical activity [1, 2]. Illnesses such as stroke, chronic bronchitis, vertigo, back pain and depression occur more frequently in the population with a lower socio-economic status than among people with a high socio-economic status, a phenomenon which applies equally to men and women.

An increasing group especially vulnerable to illness is the unemployed. Among 20- to 59-year-olds, almost 50 percent of those out of work suffer from ill health compared to 30 percent of men and women in the same age group who are working. As a result, people out of work spend proportionately twice as many days in hospital as those in employment.

Germany's over one million single mothers are also badly off. At the end of 2002 one in four was living on social security. In general, single mothers are less satisfied with their lives than married mothers and more of them suffer from bronchitis, liver or kidney diseases, as well as mental disorders. No such adverse health affects are apparent among the much smaller group of single fathers.

### 2.1.1 Poverty and social inequality

Societal development in Germany is characterized by successive increases in general prosperity and the standard of living. Poverty and social exclusion are in no sense marginal phenomena, they also affect people in middle-income groups, a fact that can be partially explained by difficult economic conditions, a persistently high unemployment rate, and changes in lifestyles and household structures.

Furthermore, the reunification of Germany, immigration of people from economically weaker countries, and the demographic ageing of the population are accompanied by major socio-political challenges [3].

Poverty and social exclusion restrict the conditions of life and the chance to participate in social life, and can adversely affect health. This is clearly shown by the influence of socio-economic status on health. The state of health of those whose situation is characterized by specific social disadvantages and health

risks, for example the unemployed and single mothers, needs to be considered when devising policies aimed at promoting social integration,

**The risk of poverty is on the rise.** Improving living conditions, rising average incomes and rising education levels in Germany over the last few decades have not reduced inequality or the risk of poverty, accompanied as they have been by difficult economic conditions and a persistently high level of unemployment. Average incomes in Germany over the last few decades, including the period following reunification, have certainly been increasing. In 2003, the so-called net equivalent income, a calculation of a household's net income that takes into account the number and age of all members of the household, averaged €1,740 (median income €1,564). This corresponds to an increase of about 17 percent in the last 10 years, the percentage increase being slightly higher in eastern Germany, where income is markedly lower than in western Germany.

At the same time, the number of people at risk of income poverty has also been rising. According to a definition agreed at the EU level, a risk of poverty exists where net equivalent income is below a threshold of 60 percent of the national median income [3]. The percentage of people living at risk of income poverty according to this definition rose from 11.7 percent in 1993 to 13.5 in 2003 at the federal level. Children and adolescents are affected to an above-average extent, whereas older people, especially those over 65 years of age, are affected to a less-than-average extent.

This development applies in particular to western Germany, although the number of people living at risk of poverty in eastern Germany also rose again between 1998 and 2003 after a previous decline. Furthermore, the proportion of people living at risk of poverty is higher in any case in eastern Germany than in western Germany (19.3 percent as opposed to 12.2 percent) [4].

**Three percent of the German population live on social security.** Welfare participation, i.e. the proportion of social welfare recipients in the population, rose from one percent in the early 1960s to 3.5 percent in 2004 (see Figure 2.1.1), a negative trend observable after reunification in both western and eastern Germany. The fact that welfare participation was lower in western Germany than in eastern Germany for a long time had to do with the high labour force participation there and the continuous employment records of east German workers, entitling them to long-term entitlements to unemployment benefit and other unemployment assistance payments. By 2004, the percentage of welfare recipients was equal for the first time for both parts of Germany, namely 3.3 percent.

A higher-than-average number of children and adolescents receive social assistance. One of the reasons why single parents and families with many children are becoming increasingly dependent on welfare is that the costs of bringing up children are only partly covered by statutory family and child benefits. At the same time, bringing up children takes a lot of time, thereby simultaneously lowering the prospects of obtaining work and reducing potential income. At 8.7 percent the proportion of people of living on welfare was notably higher among foreign-

### Methodological commentary

The overwhelming majority of welfare recipients in the narrower sense were included in the official statistics on social welfare for the last time in 2004. Since the fourth Act to Provide

Modern Services on the Labour Market (the so-called "Harz IV Reform") came into effect on 1 January 2005, people (along with their family dependants) who used to be designated social welfare recipients and are essentially fit and

available for work have become beneficiaries of basic security benefits for job-seekers, pursuant to the German Social Security Code (SGB II), and are registered as such in the statistics.

	Men		Women	
	Prevalence <sup>2</sup>	OR (US:OS) <sup>3</sup>	Prevalence <sup>2</sup>	OR (US:OS) <sup>3</sup>
Coronary infarction	3.3 %	1.56	1.9 %	2.15*
Stroke	1.6 %	2.56**	1.7 %	2.01
Diabetes mellitus	3.8 %	0.39** <sup>5</sup>	4.1 %	2.02**
Chronic bronchitis	6.7 %	1.51*	9.6 %	1.52*
Bronchial asthma	5.2 %	1.33	6.1 %	1.09
Osteoarthritis	15.8 %	1.10	22.2 %	1.18
Osteoporosis <sup>4</sup>	–	–	15.1 %	1.23
Back pains	24.4 %	1.49**	30.4 %	1.44***
Dizziness	22.4 %	1.76***	36.4 %	1.52***
Depression	12.5 %	2.01***	20.8 %	1.58***

Significance levels: \*\*\* p < 0,001 \*\* p < 0,01 \* p < 0,05

1 All results are based on estimates that the persons questioned made about themselves, not a medical diagnosis

2 Frequency of occurrence among 18 year old and older men and women

3 OR = Odds Ratios: Probability of occurrence in the lower class (US) compared to the upper class (OS) taking age factors into account

4 Information on osteoporosis was sought only from women of 45 and older

5 The results of the National Health Interview and Examination Survey 1998 (BGS98) show that both men and women from the lower class are particularly affected by diabetes mellitus. The difference from the results of the Telephone Health Survey are probably owing to the fact that different methods were used in the two surveys. A medical examination took place in BGS98, whereas in the telephone survey relied on information supplied by the persons interviewed about themselves. It is conceivable that among the lowest social strata there are persons with diabetes mellitus who are unaware of their own condition.

**Table 2.1.1:** Extent of chronic diseases and health complaints in the adult population (18 and over) a comparison of their frequency rates in the upper class compared to the lower class<sup>1</sup>. Source: Telephone Health Survey 2003 [10]

	Men			Women		
	Lower class	Middle class	Upper class	Lower class	Middle class	Upper class
Smoking	47.4 %	37.8 %	29.0 %	30.1 %	29.5 %	25.0 %
Extreme overweight <sup>1</sup>	22.3 %	18.9 %	16.2 %	31.4 %	20.3 %	9.9 %
Hypercholesterolemia	33.1 %	30.9 %	35.7 %	39.9 %	33.0 %	32.5 %
No physical sports	67.9 %	61.4 %	51.9 %	78.5 %	62.5 %	51.4 %
Hypertension	22.1 %	24.8 %	25.6 %	26.8 %	20.2 %	16.8 %

1 Body Mass Index (BMI) > 30 kg/m<sup>2</sup>

**Table 2.1.2:** Prevalence of behaviour-related risk factors according to social class among 18 to 79 year olds. Source: National Health Interview and Examination Survey 1998 [16]

### **The social gap in the field of health is widening**

The social gap in terms of morbidity frequency and mortality rates is widening rather than narrowing. These at least are the implications of studies conducted in the United States, the UK and Scandinavia [11, 18, 19]. Germany does not seem to be any different in this respect, with

social inequalities apparently increasing and a growing number of people being threatened by poverty. To date, there has not been much significant data on this topic in Germany, but there are two new studies that are very revealing. They are based on data from health surveys conducted by the Robert Koch Institute and

the Bertelsmann Health Monitor. According to both surveys the frequency of cigarette consumption, overweight and obesity have been increasing at a disproportionately high rate among socially disadvantaged groups since the mid-1980s [20, 21].

ers than the comparable rate for Germans in the year reported (3 percent).

**Education is linked to social origin.** A positive trend can be observed with respect to the level of education, which plays an important role in health and health behaviour, as does financial status. While almost two-thirds of school leavers had only a lower secondary school-leaving qualification from an elementary school or a lower secondary-modern school in the early 1970s, the proportion of school leavers with this kind of qualification was only 32.3 percent in 2002, while 41.3 percent had an intermediate school-leaving certificate and 26.4 percent a higher education entrance qualification (“Abitur”) or a technical college leaving certificate [7].

The statistical difference between men and women in terms of education has reversed over the same period. In the 1970s, 13 percent of men and 9 percent of women left school with an Abitur certificate; now 29 percent of women and 21.5 percent of men pass the Abitur. Furthermore, in contrast to the situation a few years ago, the majority of freshmen at German universities are women. Women are also steadily catching up with men in terms of both the number of graduates leaving university each year and the number of PhDs awarded [8].

Higher total educational participation rates, however, are simultaneously accompanied by worse opportunities for children from underprivileged families with no academic background. Poor school-leaving grades and vocational qualifications reduce people’s opportunities on the labour market and increase the risk of unemployment [3]. In 2003, 9 percent of those leaving secondary school did so without any qualification at all, and almost 15 percent of the 20- to 29-year-olds did not have any vocational qualification; 35 percent of non-German adolescents and young adults had not completed a vocational training course of any kind. Furthermore, it can be shown that the extent of participation in the educational system is linked to social background. The Pisa study for the year 2000 established that the chances of a German child from a higher social background going to a grammar school (“Gymnasium”) are 3.1 times higher than those of a child of non-professional parents. There are comparable differences, sometimes even wider, in relation to admissions to universities and technical colleges [3].

**Many chronic illnesses occur more frequently in the lower classes.** Numerous national and international studies confirm that health is partially affected by social status [2, 9–11]. Current data for Germany resulting from the 2003 Telephone Health Survey reveal a direct correlation between the occurrence of chronic illnesses and health complaints on the one hand, and social status on the other (see Table 2.1.1).

Strokes, back pain, chronic bronchitis and vertigo occur more frequently among men from the lower classes than from higher classes. Similarly, higher rates of coronary infarction

and diabetes can be observed among women at the lower end of the social strata, where, according to available data, the probability of becoming ill is generally 1.5 to 2.5 times higher.

Mental health is also poorer in socially disadvantaged groups. Data based on their own statements revealed that men from the lower social strata suffered twice as frequently from serious depression – and women from the same social group 1.6 times as frequently – as men and women from the higher classes.

Drawing on data from the German Socio-Economic Panel (SOEP) – a survey of private households conducted annually by the German Institute for Economic Research – it is repeatedly pointed out that rates of premature death are higher among members of socially disadvantaged groups of the population. [14, 15].

**Cigarette consumption and overweight are more prevalent in the lower classes.** The link between different disease incidence rates and different social strata is probably not only due to an unequal distribution of strains and resources, but is also a question of different health behaviour. According to data from the Health Interview and Examination Survey 1998, there is a close correlation between the level of several risk factors associated with particular lifestyles and the social stratum to which the person belongs (see Table 2.1.2). Men from the lower classes, for example, are far more likely to smoke than men from higher classes, while a lack of physical activity and overweight are particularly likely to be observed among women in the lower social stratum. Women from socially disadvantaged groups are also more likely to suffer from higher cholesterol and blood-pressure levels.

Social inequalities play a role in subjective health, too. A significantly higher proportion of members of the lower social strata characterize their state of health as “poor” or “extremely poor” (see Figure 2.1.2). This result applies equally to men and women, is equally common in western and eastern Germany, and has not changed to any significant extent over the last five years.

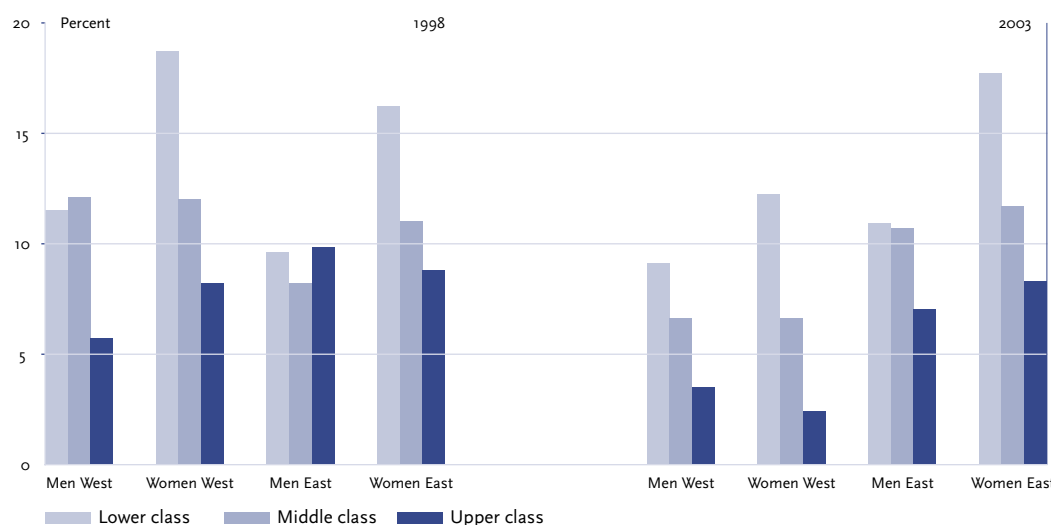
What remains unclear at the present time is the extent to which the social group to which a person belongs is reflected in the level of healthcare they receive. On the one hand, the German statutory health-insurance system guarantees extensive access to the healthcare system for everyone, regardless of income. On the other hand, extra payments and the direct purchase of medical services have become increasingly common in recent years, although co-payments in the German health-insurance system are still moderate compared to other systems around the world.

It has been confirmed by several studies that members of better-off social groups are more likely to consult specialists, whilst members of the lower classes will probably visit their GP in cases of need [22]. Furthermore, people from the higher and middle classes are more likely to take part in cancer screening and health-promotion measures [2, 23].

► Comprehensive Information on social inequality and health can be found in **“Poverty, Social Inequality and Health”** by the Robert Koch Institute, an expert assessment of the German government’s second Poverty and Wealth Report [17].

#### Definition

The concept of social stratum is often applied in analyses of the influence of social inequality on health. It is a concept that works on the premise of hierarchical social divisions or strata in society, each linked to given social advantages and disadvantages [12]. A so-called “social class index” is used for empirical examination to determine which social stratum or class a person belongs to. This index is calculated using data on household net income, educational levels and professional status; on the basis of this information a decision is then made as to whether a household belongs to the lower, middle or higher stratum [13]. The social class index is a computational construct and can only give a rather narrow reflection of social reality.



**Figure 2.1.2:** Proportion of men and women in eastern and western Germany who assess their own state of health as poor or very poor. Source: National Health Interview and Examination Survey 1998 and Telephone Health Survey 2003 [17]

Chronic disease or chronic ill-health				
	Men		Women	
	%	OR	%	OR
In employment (at least 15 hours p.w.)	27.7	Ref.	35.0	Ref.
Formerly out of work (last 5 years)	29.7	1.28*	33.9	1.03
Currently out of work (< 12 months)	35.2	1.68*	51.6	2.08**
Currently out of work (≥ 12 months)	59.2	3.68***	48.8	1.58

Functional limitations in everyday life				
	Men		Women	
	%	OR	%	OR
In employment (at least 15 hours p.w.)	24.7	Ref.	26.5	Ref.
Formerly out of work (last 5 years)	31.0	1.52***	28.3	1.17
Currently out of work (< 12 months)	23.1	1.04	51.6	3.08***
Currently out of work (≥ 12 months)	51.9	3.19***	40.2	1.67*

%. Percentage frequency

OR: Odds Ratio, after adjusting for age

Ref.: Reference category

Significance level: \*\*\*  $p < 0,001$ ; \*\*  $p < 0,01$ ; \*  $p < 0,05$

**Table 2.1.3:** Health problems in relation to the length of unemployment among 20 to 59 year old men and women. Source: Telephone Health Survey 2003



### 2.1.2 Unemployment

**Unemployed people face a higher risk of disease and a higher mortality rate.** Since German reunification in 1990 there has been a considerable increase in unemployment in Germany. In August 2005 more than 4.7 million people were registered as unemployed. This corresponds to an unemployment rate of almost 10 percent in western Germany and over 18 percent in eastern Germany. Not only people with low qualifications are affected, but to some extent also those with higher qualifications.

The consequences of unemployment are not only negative in a financial sense; they are quite likely to also have negative psychological effects, such as a lowering of self-esteem and loss of social contacts [24]. The consequences of unemployment on health have been documented in numerous empirical studies which show that physical and mental health is poorer and the risk of premature death is higher among the unemployed, compared to the national average [25–27].

In the 2003 Telephone Health Survey, 48.3 percent of unemployed persons between the ages of 20 and 59 said they were suffering from an illness or health impairment of one kind or another. Almost 40.5 percent reported being restricted in their day-to-day activities by health problems. By contrast, only 30.7 percent of those in employment reported suffering from health impairments and only 25.4 percent mentioned being restricted in their daily life due to health issues.

The longer men are unemployed, the worse their health problems become, whereas women's health can be just as badly affected by a short period of unemployment, although it may even improve the longer they are unemployed (see Table 2.1.3). This difference can perhaps be explained by the fact that many women only register as unemployed for short periods – because they are often employed for shorter periods, so that their periods of employment tend to be more frequently interrupted. Furthermore, a relationship or marriage represents more of a social safety net for women than it does for men. Another possible explanation is that, since men are still regarded by society as the breadwinners, being unemployed may undermine men's self-esteem to a greater extent and affect them more deeply than it does women [28].

**Unemployed people are more frequently healthcare customers.** Because their health is generally poorer, the unemployed make more use of the medical healthcare system. In 2000, the Gmünder Health Insurance Fund (GEK) registered significantly more hospital days for unemployed members than for people with jobs. (Men: per 1000 insured years and taking age structure into account, 2,257 days for the unemployed and 963 days for the employed; the figures for women were: 2,162 for the employed and 1,263 for the unemployed. This corresponds to a ratio of 2.3:1 for men and 1.7:1 for women.)

#### Definition

The Federal Employment Agency defines unemployment according to the German Social Security Code (section 16 SGB III). People under the age of 65 are defined as unemployed if they are contractually employed or self-employed for less than fifteen hours a week or not at all, are in a position to take up work immediately and have personally registered as unemployed. In most observational studies, however, unemployment is only measured by asking whether a person has registered at their employment office or whether a person would describe him/herself as being unemployed.

The difference relating to certain groups of illnesses is even more marked (see Figures 2.1.3 and 2.1.4). Mental and behavioural disorders cause unemployed men to spend almost seven times as many days in hospital as employed men; the ratio among women is 3:1. There are also significant differences between the employed and the unemployed in terms of time spent in hospital because of infections, metabolic diseases, digestive disorders, injuries, poisonings and even pregnancy and childbirth.

Despite the longer average period of hospital confinement compared to the employed, the absolute figure for unemployed persons in need of therapy is very low. For example, in 2002 less than three percent of unemployed people insured with the GEK were treated for mental disorders.

**Men out of work smoke more and are physically less active.** For men in particular, unemployment goes hand-in-hand with more risk-prone behaviour: they smoke more and are physically less active. In addition, many of them are overweight, which might be evidence of an unhealthy diet [27]. Data from the Gmünder Health Insurance Fund point to a higher mortality rate especially among the long-term unemployed (both men and women).

What remains unclear is the extent to which unemployment is indeed the cause of increased health risks. People may lose their jobs for reasons of ill health in the first place, rather than ill health resulting from their loss of work. In the 2003 telephone survey one unemployed man in four attributed his loss of work to ill health; the figure was one in three among long-term unemployed men. Among women the corresponding figures of 15 and 12 percent respectively are considerably lower [28]. A conclusive answer to the question of the role played by unemployment can only be obtained by conducting long-term studies that provide comparative data for the state of health of persons before and after they lose their jobs. Hardly any such studies have been made to date.

► Comprehensive Information on **unemployment and health** can be found in booklet 13 of the Federal Health Reporting's series [27].

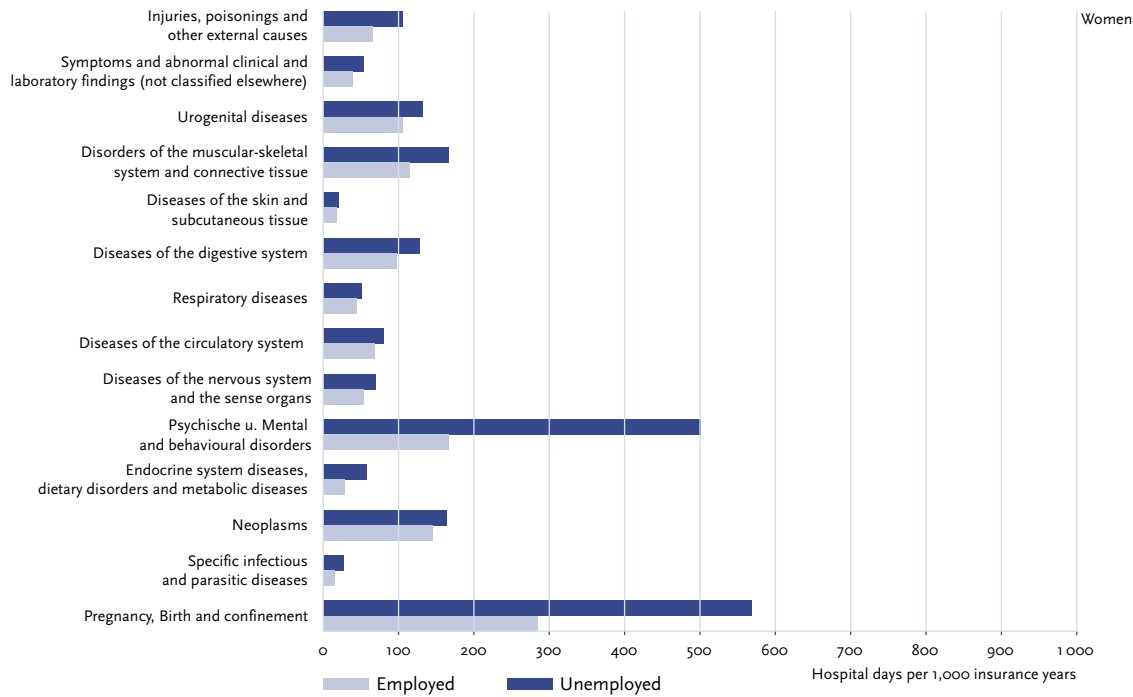
### 2.1.3 Single mothers

**The number of single mothers is rising.** Single fathers are not worse off economically than married fathers, whereas single mothers face numerous disadvantages: worse prospects on the labour market, a lower income and more frequent dependence on social assistance [28–30].

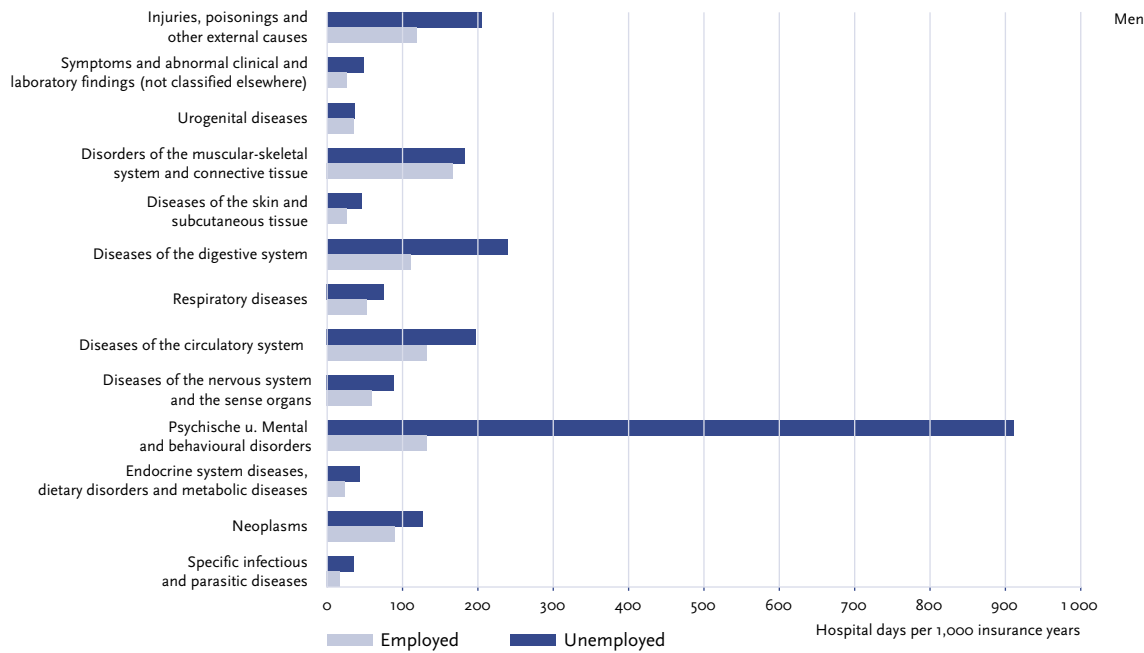
The number of single parents has been rising steadily in recent years. In 2003 there were 1.5 million single parents with children under 18 years of age in Germany. Relative to all families with children under 18, this corresponds to 15.8 percent in western Germany and 22.3 percent in eastern Germany. About 87 percent of single parents are women who are divorced, separated, single or widowed and live in a household with their children and without a partner [3].

**Single mothers are less satisfied.** Single mothers are affected by problems in many areas of life and are much less satisfied with their situation than married mothers (see Figure 2.1.5). There are particularly marked differences in household income, living standards, accommodation and satisfaction with life in general.

**Single mothers are more often ill.** As shown by stress-research studies, stressful life situations can impair long-term health



**Figure 2.1.3:** Hospital days classified according to persons employed and unemployed women according to ICD-10 diagnosis related groups. Source: Gmünder Health Insurance Fund 2000 [27]



**Figure 2.1.4:** Hospital days classified according to employed and unemployed men according to ICD-10 diagnosis related groups. Source: Gmünder Health Insurance Fund 2000 [27]

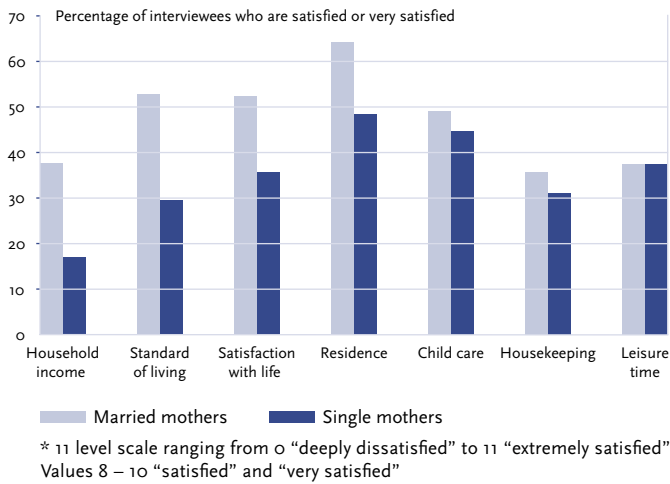


Figure 2.1.5: Satisfaction\* of single and married mothers with various aspects of their lives. Source: Socio-economic Panel 2000 [31]

Selected Illnesses <sup>1</sup>	Single Mothers n = 89	Married Mothers n = 728
Chron. Bronchitis*	9.0%	3.9%
Inflammation of the liver, Hepatitis*	10.2%	4.1%
Pyelitis*	23.6%	14.2%
Kidney Stones, renal colic*	15.7%	5.2%
Migraine	36.0%	26.3%
Mental illnesses*	24.7%	10.9%
Contact allergies	25.0%	34.8%
Other allergies	14.9%	20.4%
Diseases of the womb, ovaries, fallopian tubes	25.3%	17.2%

<sup>1</sup> Only those illnesses are represented showing a group variable of over 5%.  
\* Significance (p < 0,05)

Table 2.1.4: Lifetime prevalence of selected illnesses among single and married mothers. Source: National Health Interview and Examination Survey 1998 [31]

[30] and, according to data taken from the 1998 National Health Interview and Examination Survey (BGS98), single mothers are more likely to suffer from kidney and liver diseases, chronic bronchitis and migraine than married mothers (see Table 2.1.4). 24.7 percent of single mothers suffer from mental disorders, a remarkably high figure which is over twice the rate for married mothers.

In addition, single mothers have a lower so-called health-related quality of life. This was highlighted in the 1998 National Health Interview and Examination Survey using the SF-36 health survey questionnaire which covers a total of eight aspects of physical, emotional, psychological and social states of health [32]. Single mothers reported a lower quality of life in every single category than married mothers. The differences varied from area to area: the difference with regard to physical impairments was not substantial, but when it came to the general feeling of health, vitality and social efficiency the differences were greater and statistically significant. They were the most evident with regard to physical pain, emotional problems and mental well-being.

**Single mothers suffer from a lack of social recognition.** It seems clear that financial support and success in claiming maintenance allowance is not enough to improve the situation of single mothers. It is necessary to offer flexible child-care opportunities which would enable single parents to take up employment. Not only better material conditions would improve the life of single mothers, but first and foremost social recognition and respect for bringing up their children [30].

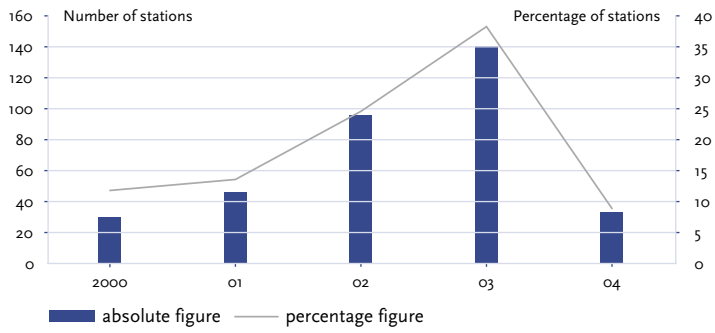
► Comprehensive Information on the **health of single mothers and fathers** can be found in booklet 14 of the Federal Health Reporting's series [31].

**Single fathers have fewer problems than single mothers.**

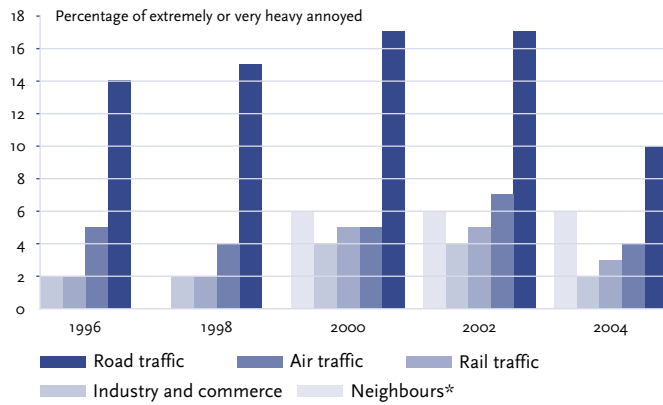
Single fathers do not suffer from the same disadvantages as single mothers. At the end of 2004, 6.5 percent of single fathers in Germany were dependent on social security, compared to 26.1 percent of single mothers. Single fathers are not significantly worse off than married fathers

in terms of job or income prospects. It is, therefore, hardly surprising that they do not suffer from the health impairments observed among single mothers. According to the results based on the Socio-Economic Panel, a representative household survey conducted by the German Institute for Economic Research, in respect to some aspects of their lives single fathers are

less satisfied than married fathers. However, this does not seem to have any affect on their assessment of their own state of health. What remains unclear is whether single fathers really have less stress to cope with than single mothers in terms of health, or whether they have a different perception of the same stress and are able to cope with it in a different way.



**Figure 2.2.1:** Proportion of PM<sub>10</sub> monitoring stations (as an absolute figure and as a percentage of all PM<sub>10</sub> monitoring stations), where the daily mean limit value of 50 µg/m<sup>3</sup> PM<sub>10</sub> concentration, in force since 1.1.2005, was exceeded on more than 35 days. Source: Federal Environmental Agency, 2005



\* Modification of the survey instrument between 1998 and 2000

**Figure 2.2.2:** Noise stress from different sources. Source: German Federal Ministry of the Environment, 2004 [34]

## 2.2 Environmental influences and accidents

### ► Abstract

According to estimates made by the World Health Organization, up to ten percent of health disorders in the highly developed countries of northern and western Europe are caused by environmental influences [33]. This estimate is based on a broad definition of the term “environmental”, which, along with chemical and physical aspects such as the quality of air and water, radiation and noise, also includes living conditions, accidents and climate change.

According to representative surveys in Germany, a quarter of the population think that environmental factors have an extremely harmful affect on health. Two-thirds of those surveyed believe that environmental factors will weigh heavily on coming generations [34]. This being the case, an active information policy is needed to counter the fears and respond to the questions of the population.

Air quality in Germany has been improving over the last two decades, particularly as a result of the application of European standards, although it is true that some areas, most of them conurbations, suffer from dense concentrations of particulate matter, which is a predisposing factor of bronchial and cardiovascular complaints. Poor quality air indoors is also detrimental to health.

The most significant source of noise in Germany is traffic, and one in every ten German finds the level of traffic noise very annoying.

An important reason for the increase in exposure to ultra-violet radiation is in the increase in sun-bathing and the increased use of solariums. About half of exposure to so-called ionising radiation, such as X-rays, stems from medical diagnostic procedures. Chemicals and heavy metals do not currently endanger the health of the great majority of people in Germany.

In 2004 almost 20,000 people in Germany died as a result of accidents that occurred at home, during leisure time, in road traffic or at work.

### 2.2.1 Air quality

#### **Urban agglomerations are still polluted with particulate matter.**

The quality of air in Germany is better now than it was twenty years ago. Emissions of harmful air pollutants have been reduced by the enforcement of European environmental standards, thereby reducing the corresponding health risks; nonetheless, there remains a need for improvement in conurbations and it can be expected that the EU threshold value laid down in 2005 for fine particulates (PM<sub>10</sub>) will continue to be exceeded in numerous German municipalities as it has been in previous years (see Figure 2.2.1).

Clean-air plans which have been drawn up by municipal environmental authorities to reduce fine-particulate air pollution, such as traffic restrictions or traffic-control measures, may not be sufficient to reduce particle pollution to acceptably low levels. Additional options, for example tax incentives for particulate filters, are being considered.

A study commissioned by the Federal Environment Agency has concluded that the systematic use of particulate filters in diesel-powered vehicles can be expected to reduce the overall mortality rate in Germany and prolong the statistical life expectancy of the whole population by one to three months [35, 36]. Such

calculations, based on the results of epidemiological studies and air-pollution dispersion models, provide orientation points as regards the impact of particulate air pollution on health, but they do involve a considerable degree of uncertainty.

#### **Poor indoor air quality air is also detrimental to health.**

Tobacco smoke, natural allergens such as mould spores and the excreta of house dust mites, as well as substances released by building materials or household furnishings, are among the most important indoor pollutants. Children in particular should be protected from indoor passive smoking (see also the section on tobacco and alcohol consumption) [37].

In some regions of Germany indoor air is polluted with radon, a radioactive noble gas that can have very serious effects on health. According to a Europe-wide study, indoor air radon is the second most common cause of lung cancer after cigarette smoking [38].

### 2.2.2 Noise and radiation

#### **One in ten persons in Germany feels adversely affected by traffic noise.**

The most important source of noise in Germany is traffic. Higher levels of noise can lead to sleep disorders, stress and lower levels of concentration.

The subjective assessment of noise pollution is accepted as a reliable indicator of an individual's perceived noise exposure. Around ten percent of the population regard traffic noise as very annoying (see Figure 2.2.2) [34].

Extreme noise levels caused by leisure activities – for example the playing of loud music, privately or in discotheques – are also important. Such leisure noise occasionally reaches levels that can damage people's hearing, and can even lead to deafness [39].

#### **Sun beds and solariums increase exposure to UV radiation.**

The exposure of the population to UV radiation has been constantly rising as a result of increased sunbathing and the growing use of solariums. This has contributed to an increase in the incidence of skin cancer. However, the improved registration of new cases of skin cancer by cancer registries may well be part of the explanation of the statistical increase in the number of cases. The system of UV monitoring implemented in Germany includes the measurement and assessment of daily natural doses of UV radiation. The data for the 2003 reporting period showed that in June and July ultraviolet values reached a maximum of eight on the international UVI (Ultra-Violet Index) scale. It cannot be confirmed from the data available for Ger-

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#### Definition

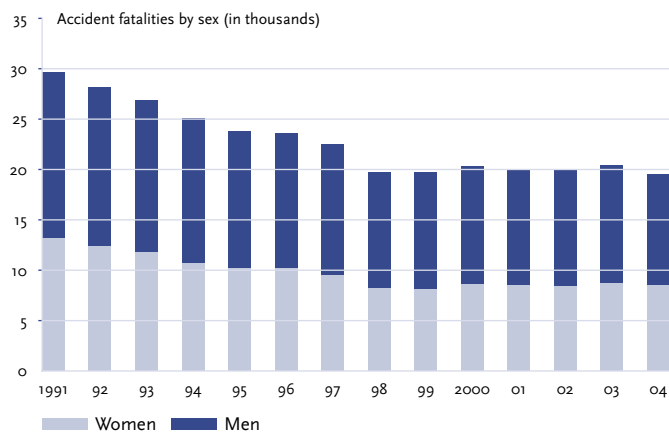
Dust is a mixture of airborne particles that is emitted, for example, by industry and traffic. It is classified according to particle size. The smaller particles, which can be inhaled and have a radius of not more than ten micrometers (PM<sub>10</sub> – Particulate Matter, radius up to 10 µm), reach the bronchia through the trachea, and some of them reach the pulmonary alveoli.

Fine particulate matter can lead to bronchitis and respiratory symptoms such as coughing. According to recent studies, it is above all particulates smaller than 0.1 micrometers – so-called ultra-fine particles – that penetrate as far as the pulmonary alveoli. They can have an adverse affect not only on the respiratory system, but also on the cardiovascular system. The effect of ultra-fine particles, especially on old people and people with respiratory and cardiovascular diseases, can be to cause more health complaints and increase mortality.

		Germany		Old Federal States (Western Germany)		New Federal States (Eastern Germany)	
		n	%	n	%	n	%
Presence of lead in blood (Adults aged 18 to 69)	To HBM-I (150 µg/l)	3353	99.6	2711	99.6	642	99.3
	Between HBM-I and HBM-II (>150 to 250 µg/l)	13	0.4	10	0.4	3	0.5
	Over HBM-II (>250 µg/l)	2	0.1	1	0.03	1	0.2
	Women of childbearing age (18–45)						
	To HBM-I (100 µg/l)	1269	99.3	1040	99.4	229	99.1
	Between HBM-I and HBM-II (>100 to 150 µg/l)	5	0.4	4	0.4	1	0.5
	Over HBM-II (>150 µg/l)	3	0.3	2	0.2	1	0.5
Presence of mercury in blood (Adults aged 18 to 69)	To HBM-I (5 µg/l)	4613	99.3	3739	99.3	874	99.4
	Between HBM-I and HBM-II (>5 to 15 µg/l)	32	0.7	27	0.7	5	0.6
	Over HBM-II (over 15 µg/l)	0	0.0	0	0.0	0	0.0
Presence of cadmium in urine	Adults (aged 18–25)						
	To HBM-I (1 µg/g Crea.)	600	99.5	489	99.4	111	100.0
	Between HBM-I and HBM-II (>1 to 3 µg/g Crea.)	3	0.5	3	0.6	0	0.0
	Over HBM-II (>3 µg/g Crea.)	0	0.0	0	0.0	0	0.0
	Adults (26–69 years old)						
	To HBM-I (2 µg/g Crea.)	4107	99.5	3325	99.5	782	99.6
	Between HBM-I and HBM-II (>2 to 5 µg/g Crea.)	18	0.4	15	0.5	3	0.4
Over HBM-II (>5 µg/g Crea.)	1	0.02	1	0.03	0	0.0	
Presence of pentachlorophenol in urine	Adults (aged 18–69)						
	To HBM-I (20 µg/g Crea.)	691	100	560	100	131	100
	Between HBM-I and HBM-II (>20 to 30 µg/g Crea.)	0	0.0	0	0.0	0	0.0
	Over HBM-II (>30 µg/g Crea.)	0	0.0	0	0.0	0	0.0

Note: Owing to rounding up and down totals are not always exactly 100 %.

**Table 2.2:** Proportion of the German population showing the presence of raised levels of lead, cadmium, mercury or pentachlorophenol in their blood or urine, 1998. Source: Federal Environment Agency, Environment Survey 1998 [41]



**Figure 2.2.3:** Accident fatalities by sex (1991–2004; until 1998 ICD-9, after 1998 ICD-10). Source: Causes-of-death statistics, Federal Statistical Office

many that the increase in UV radiation has been caused by the depletion of the ozone layer [40].

**A large proportion of radiation exposure is caused by medical X-ray procedures.** As a result of both natural radiation (cosmic radiation, radioactive materials in the Earth's surface, such as radon) and man-made radiation (medical and technical uses), everyone is constantly exposed to a given dose of high-level (ionising) radiation. Ionising radiation can cause genetic damage and is potentially carcinogenic. The mean effective dose is given in millisieverts (mSv), and the natural and man-made radiation exposure is about two mSv per year. In 2003 the mean effective dose per person per year was calculated at 4.0 mSv, compared to 4.1 in the previous year.

The change reflects a revised assessment of radiation exposure in medical examinations, for example by X-rays and computer tomography [40]. Radiation exposure due to medical procedures, i.e. X-ray diagnostics (1.8 mSv per year) and nuclear medicine (0.1 mSv per year), constitutes most of the man-made radiation dose; the amount generated by other radiation sources is very small [40].

### 2.2.3 Human exposure to pollutants

**Overall, the exposure of people to pollutants is low in Germany.** A great variety of different chemicals can penetrate the human organism every day through diet, the air or direct contact. However, the health effects of most of the chemical substances in use today have not been subject to extensive research.

The Environmental Survey, which was conducted by the German Federal Environment Agency in close association with the 1998 National Health Interview and Examination Survey carried out by the Robert Koch Institute, has made data available on the exposure of the population between the ages of 18 and 69 to pollutants [41]. Along with the monitoring of interiors and tests of household tap water, the survey applied so-called human biomonitoring methods. The potential hazards of chemicals and heavy metals have been sufficiently assessed; 99 percent of the population are currently not at risk from them, with the exception of carcinogenic substances (see Table 2.2). However, the health effects of a great variety of chemicals are not yet sufficiently known to allow an assessment of the risks they may represent, making further research on them necessary. This is especially the case with substances with hormonal effects (e.g. plasticizers in articles of daily use) and certain carcinogenic substances.

The body burden of contaminants in the population has not remained constant: contamination of the body with lead, cadmium, mercury, pentachlorophenol (PCP) and persistent organic compounds such as PCBs (polychlorinated biphenyls)

#### Definition

The UV index describes the highest level of expected solar UV radiation (which causes sunburn) at the Earth's surface for a certain day. An index value of 0 indicates a low level of exposure, 8 or more a very high level of exposure.

The exposure of organisms to high-level ionising radiation is expressed in millisieverts (mSv). Ionising radiation can lead to genetic damage and is potentially carcinogenic. Dosage in mSv is calculated with due regard to the so-called radiation weighting factor, which takes into account the fact that different forms of radiation (for example corpuscular radiation as opposed to X-rays) affect the human tissue to different degrees.

and DDT has declined significantly over the last ten to twenty years [41]. Moreover, the manufacture, importing, use or application of PCBs and PCP or products containing PCP has been banned in Germany since 1989.

By contrast, chemicals used as biocides such as pyrethroids (an insecticide) and organophosphates (used in pest control) or plasticizers, can be detected in wide sections of the population in the meantime. Conclusions from these findings are included in the national regulations on chemicals and the European chemicals safety assessment.

### 2.2.4 Accidents

**Accidents are the most frequent cause of death among children and young adults.** Accidents are the most frequent cause of death among children and young adults up to the age of 25. Among men up to the age of 35 they are in fact the most frequent cause of death. In 2004 fewer than 20,000 people died in Germany as the result of an accident (see Figure 2.2.3). In 2003, around 8.45 million people were injured in accidents [42].

Accidents are responsible for almost an eighth of all life years lost due to death before reaching the age of 65 [43]. One in ten cases of hospital inpatient treatment in 2003 was for injuries [44].

Disablement and a loss of life quality are among the consequences of accidents. However, there are also significant economic consequences, notably the costs of medical treatment, currently totalling € 8.8 billion a year, and the inability to work. In 2002 injuries and poisonings caused a quarter of all working years lost [45].

**The number of traffic fatalities has been falling for decades.** In 2004 5,842 persons were killed in traffic accidents, the lowest level since the beginning of official statistics on road traffic accidents; in 1970, 21,332 people died in road traffic accidents. 445,968 persons were injured in the 2.26 million accidents recorded by police in 2004, of whom 80,801 were severely injured and 359,325 were slightly injured (see Figure 2.2.4).

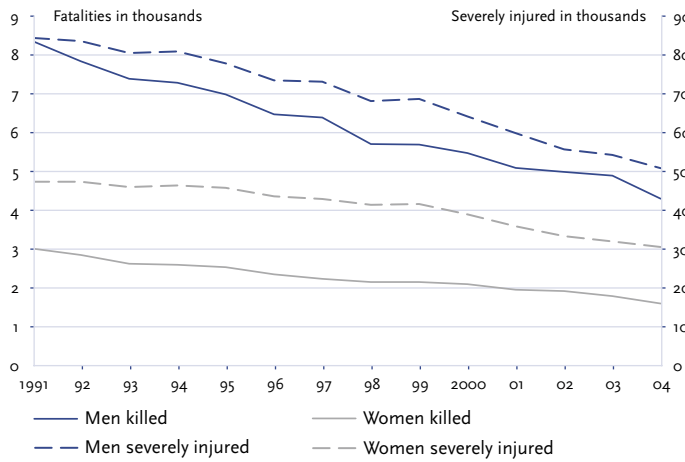
As in the past, most road traffic accidents involving human injury occur within built-up areas (65.8 percent in 2004); these accidents only cause 25.4 percent of fatalities, however. The collisions with the most serious consequences take place on

#### Definition

Human biomonitoring (HBM) is a procedure for measuring the actual quantities of harmful substances that have been absorbed by an organism. It includes – for example – the analysis of blood and urine samples. The influence of a certain exposure level on health is indicated by what is known as the HBM value, which is based on expert assessments.

HBM I represents a level of concentration of a harmful substance at which no adverse effects on health are to be expected according to the current level of knowledge.

HBM II, on the other hand, represents a concentration of a harmful substance above which a potential risk may indeed exist. It is therefore the level above which there is urgent need for medical counter-measures. The HBM II value is, therefore, an “intervention value”, since the measurement range between HBM I and HBM II records a point at which – according to scientific studies – the possibility of detrimental effects on health cannot be ruled out with a sufficient degree of certainty. If the findings are confirmed by control measurements, the cause for the increased exposure level should be examined and, if possible, the level of contamination reduced. The HBM I value is therefore to be regarded as a control value.



**Figure 2.2.4:** Fatalities and fatal injuries (men and women) in road traffic accidents (1991 – 2004). Source: Official Traffic Accident Statistics, 2005

rural roads including main roads but excluding motorways. Accidents on these rural roads cause 27.9 percent of all accidents involving personal injury, but 62.7 percent of all fatalities. Motorways account for 6.3 percent of all accidents and 11.9 percent of all fatalities.

In 2004 the most frequent cause of accidents was again “inappropriate speed”; it was a factor in 17 percent of the cases where vehicle drivers were responsible for the accidents.

**Four times as many young men die in road traffic accidents as young women.** Young adults are more likely to be involved in road traffic accidents than persons in other age groups, and young men are at must greater risk than young women. In 2004 of the 18- to 24-year-olds involved in road traffic accidents, 56.9 percent were men and 43.1 percent were women. Young men are also more liable to suffer more severe accidents: in 2004 77.8 percent of fatalities in the 18–24 age group were men and 22.2 percent women. The statistics show a 3:1 ratio of male to female deaths for the number of fatalities in all age groups – to the disadvantage of males. This ratio has remained practically constant over the last ten years.

Children are a group of road users that are particularly at risk due to their level of physical development, their incomplete awareness of risks and their frequently spontaneous behaviour. In 2004 37,285 children under 15 years of age were injured in road traffic accidents; 6,577 of these suffered serious injuries and 153 were killed.

Comparing results internationally shows that the traffic death rate for Germany is slightly below the EU-15 average (see Figure 2.2.5). However, the lower traffic death rates in the Netherlands and the UK show that the number of road traffic fatalities in Germany could be reduced still further.

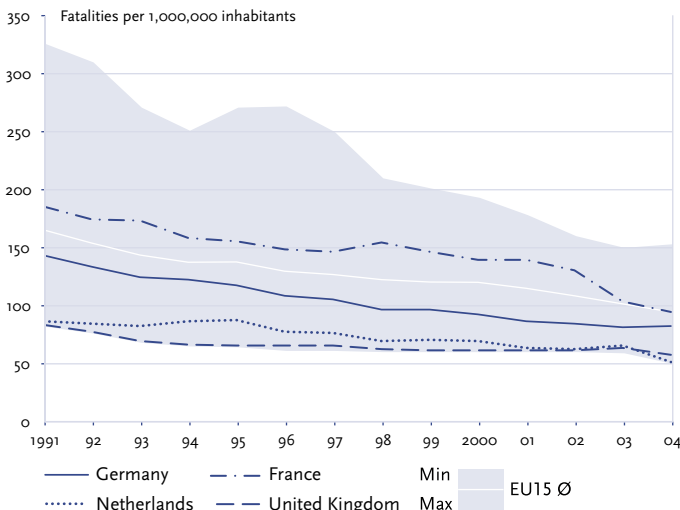
**Domestic and leisure accidents are twice as frequent as road traffic accidents.** The number of domestic and leisure accidents is more than twice as high as that of road traffic accidents, yet there is no legal framework for their registration. The data cited here on domestic and leisure-related accidents are based on a representative survey of households conducted in 2000/2001, with the results extrapolated for Germany.

According to this information, approx. 5.36 million home and leisure accidents occurred in the year 2000: an accident rate of 65 per 1000 inhabitants. This figure is almost identical to that recorded in a comparable study in 1996.

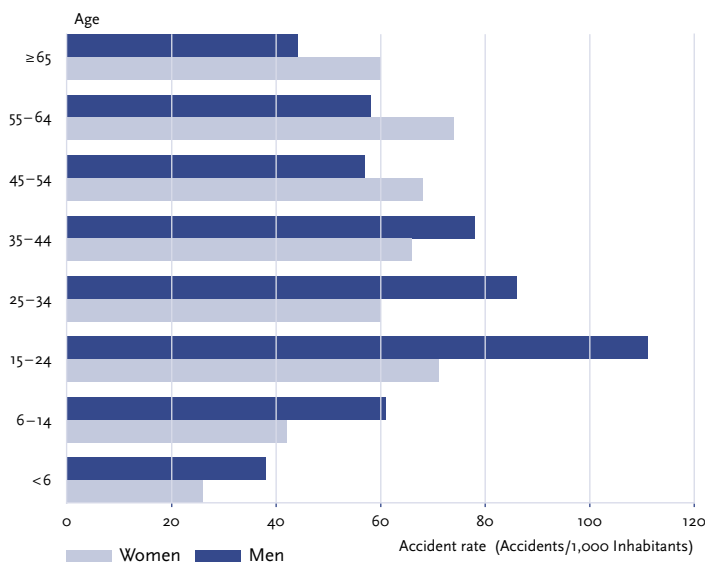
Where accident rates are classified according to age group and sex (see Figure 2.2.6), the risk of accidents is shown to be at its highest among 15- to 24-year-old men and 55- to 64-old women. When both sexes are taken together, the highest risk of accidents is observed in the 15- to 24 age group (91 accidents per 1000 persons) followed by the 25- to 35-year-olds and the 35- to 44-year-olds, who are also at higher risk (74 and 72 per 1000 persons respectively). The risk for age groups under 34 years of age has declined compared to the 1996 rates, but has risen for people over 35.

While the proportion of domestic and leisure accidents for men falls continuously with increasing age, there is a rise among middle-aged women which only stops at 65 and over, so that there are more female than male accident fatalities among persons aged 45 and over [46].

**The number of fatal accidents involving children is falling.** Eleven percent of all domestic and leisure accidents involve children under 14 years of age, the majority of which (61 percent) happen to boys. About half (47 percent) of all domestic and leisure accidents in this age group happen in the home or its immediate vicinity, in other words in the places where chil-

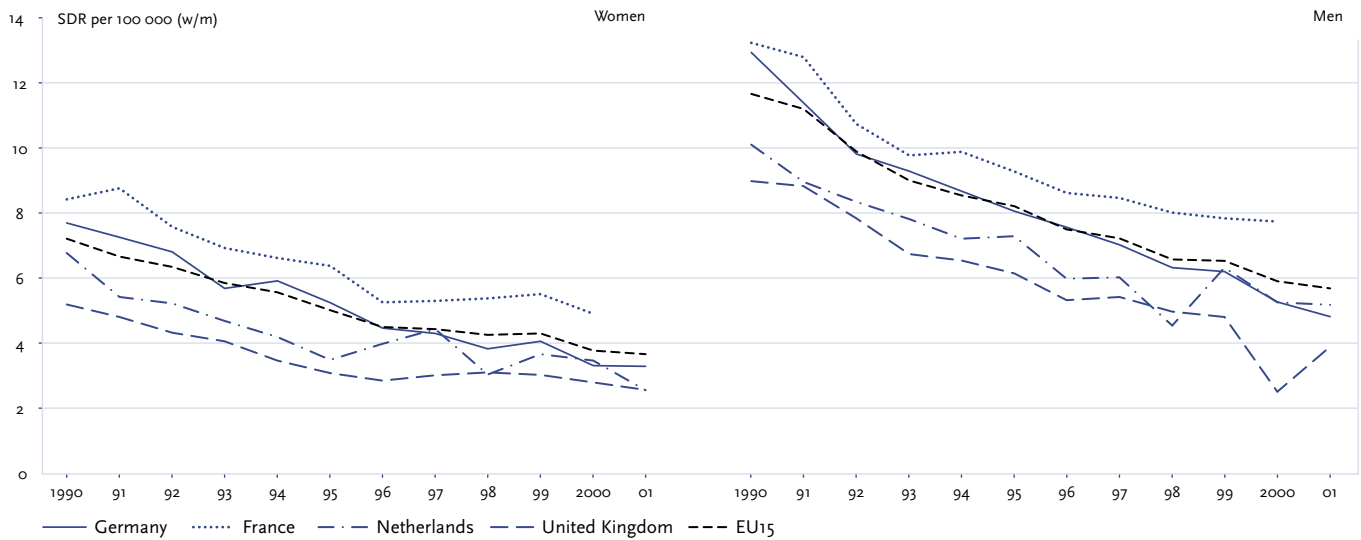


**Figure 2.2.5:** Road fatalities (per 1,000,000 inhabitants); 1991 – 2004; in selected EU member states. Source: CARE data base 2006

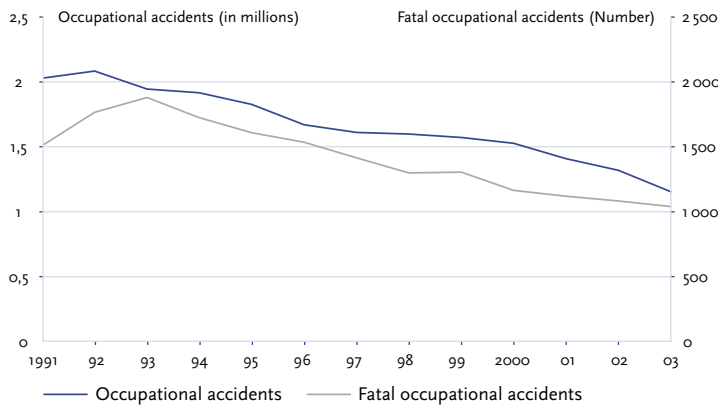


**Figure 2.2.6:** Accident rates by age groups and sex, 2000. Source: Federal Institute for Occupational Safety and Health (BAuA) [46]

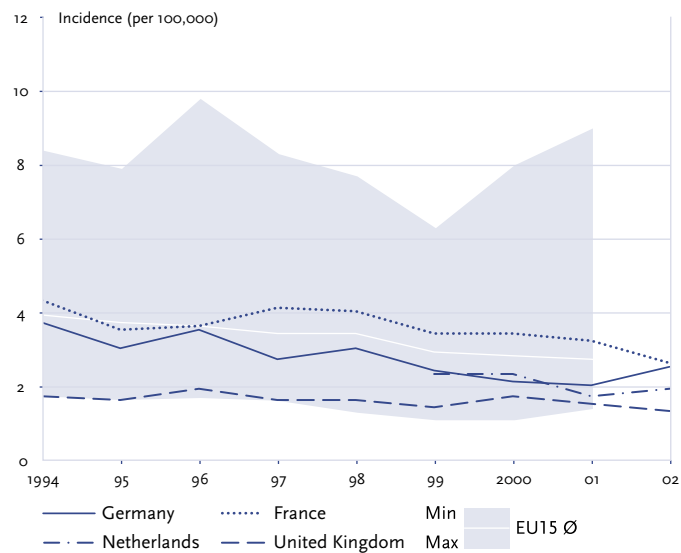




**Figure 2.2.7:** Age standardised accident fatality rates for 0- to 14 years olds, 1990 – 2001, by sex, in comparison with selected EU member states. Source: Health For All data base WHO, 2005



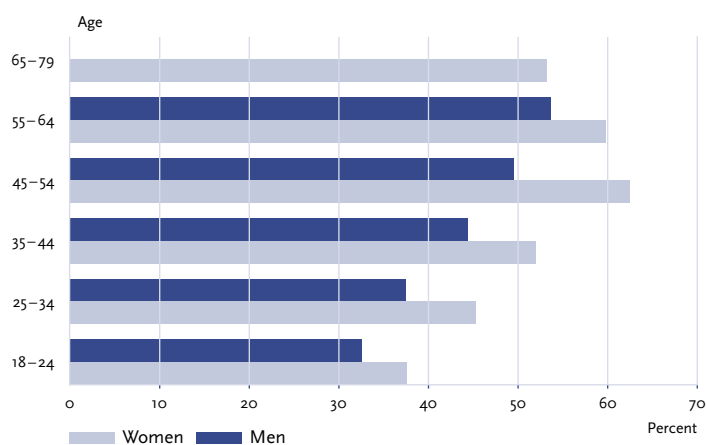
**Figure 2.2.8:** Occupational accidents and fatal accidents, number, 1991 – 2003 (excluding commuting accidents). Source: Federal Institute for Occupational Safety and Health [47]



**Figure 2.2.9:** Standardised incidence rate of fatal occupational accidents, 1994 – 2002, excluding commuting accidents and transport related accidents, Comparison with selected EU member states (Average value EU15 (2002) provisional). Source: Eurostat 2005

	Men		Women	
	Median	Percentile 25–75	Median	Percentile 25–75
<b>Food</b>				
Bread	168	121–224	121	89–160
Cereal/grain	45	23–81	39	21–68
Pastries	28	12–53	23	10–42
Leaf vegetables	26	10–51	29	14–54
Cabbage vegetables	38	21–60	39	23–61
Other vegetables	139	95–204	140	93–207
Potatoes	130	85–181	98	63–136
Fruit	145	71–238	177	107–281
Cakes	20	5–45	21	7–42
Confectionery	38	19–67	31	17–52
Dairy products	229	133–401	219	138–352
Eggs	19	10–31	16	8–26
Meat	102	68–145	69	45–99
Poultry	13	6–26	13	6–22
Sausage & sausage products	54	30–82	27	13–44
Fish	16	7–28	14	5–24
Animal fats	10	5–20	8	4–15
Vegetable fats	15	10–23	12	8–18
<b>Beverages</b>				
Beer	143	18–429	0	0–29
Wine	8	0–56	11	0–41
Coffee	340	121–600	340	150–534
Juices and squashes	54	0–232	61	1–195
Lemonade and pop	161	0–471	146	0–396
Drinking water	500	150–986	595	293–1000

**Table 2.3:** Consumption of selected groups of foods in grams per day by 18 to 79 year olds, median and interquartile range. Source: National Nutrition and Diet Survey 1998



**Figure 2.3.1:** Consumption of fruit and vegetables by 18 to 79 years old members of the German population. Proportion of persons consuming more than 400 grams of fruit and vegetables per day (excluding juices). Source: National Nutrition and Diet Survey 1998

dren spend most of their time. From their first year onwards, accidents are a main cause of damage to children's health.

The number of fatal accidents to children is nevertheless falling (all kinds of accidents, see Figure 2.2.7). Between 1990 and 2001, the age-standardized fatality rate among 0- to 14-year-old girls fell from 7.7 to 3.2 fatalities per 100,000 persons. Among boys the rate fell from 12.9 to 4.8 per 100,000. By international comparison, the fatality rate for 0- to 14-year-olds in Germany in 2001 was under the EU-15 average.

**The number of occupational accidents is also falling.** The number of accidents registered by the statutory health insurers and the number of accident fatalities has been falling constantly since 1993 and in 2003 reached the lowest level since 1960 (see Figure 2.2.8) [47]. An occupational accident is defined as an accident which is suffered by an insured person in the course of his/her insured occupational activity on or outside the workplace.

Of the 1,142,775 notifiable occupational accidents registered in Germany in 2003, 76 percent were registered by the employers' liability insurance associations, 14 percent by the statutory occupational accident insurance, and ten percent by the agricultural employers' liability insurance associations. Of the 1,029 fatal occupational accidents, 76 percent affected members of the employers' liability insurance associations, 20 percent were insured by the agricultural employers' liability insurance associations, and 8 percent by the statutory occupational accident insurance. The expenditure of statutory accident insurers in Germany on treatment and further measures amounted to approx. €10 billion in 2003.

In 2002, the age-standardized rate of fatal occupational accidents in Germany was around the EU-15 average (see Figure 2.2.9). Lower rates were reported from the UK and the Netherlands.

## 2.3 Nutrition

### ► Abstract

Culture and social background play a role in determining dietary behaviour, which has an influence on health and well-being as well as on the occurrence and subsequent progression of numerous illnesses. The 1998 National Health Interview and Examination Survey and the linked Nutrition Survey provide comprehensive data on German dietary behaviour. Trend analyses are possible thanks to older data sources, especially the so-called VERA study of 1987/1988 and the 1990 and 1992 National Health Interview and Examination Surveys.

It can be seen from the results of these surveys that Germans now consume more fresh fruit and vegetables, more fibre and carbohydrate-rich foods and more non-alcoholic drinks compared to the late 1980s. Nonetheless, still only about half of men and women consume the recommended minimum daily intake of 400 grams of fruit and vegetables, the greatest deficits in this respect being recorded among the younger age groups. Meanwhile, the consumption of fast foods and frozen food has risen significantly.

There is a trend towards functional foods and drinks such as ACE drinks, probiotic yoghurt and dietary supplements, although these are not required by much of the population.

The energy intake of the majority of people in Germany is sufficiently covered, with dairy products and bread being the main source of nutritional energy. In general, there is now a higher consumption of sweet products (candies) and animal fat, with corresponding health risks. It cannot be said that there is a definitively more favourable pattern of dietary behaviour in either eastern or western Germany. East-west variations in diet largely disappeared during the 1990s. The overwhelming majority of men and women in Germany are well supplied with most vitamins and mineral nutrients, although the intake of vitamin D and folic acid in particular remains insufficient. This is particularly important for pregnant women, as a folic acid deficiency can lead to malformations of the embryo. Pregnant women face the additional risk of iodine deficiency. However, iodine deficiency – which used to affect large sections of the population in Germany – is very much on the decrease due to the widespread use of iodised table salt, and no longer seems to play a significant role in certain population groups.

### 2.3.1 Dietary behaviour and energy input

**Men eat more, women eat more healthily.** On average, men eat more, and women eat slightly more healthily [48, 49]. Women drink more water, consume more fruit and – as measured by their total energy input – more vegetables. Table 2.3 shows the average daily quantities consumed of selected foodstuffs.

Only about half of men and women consume the minimum daily intake of just over 14 ounces (400 grams) of fruit and vegetables recommended by the D-A-C-H group of associations (German Nutrition Society, Austrian Nutrition Society, Swiss Society for Nutrition Research, Swiss Nutrition Association) [50] (see Figure 2.3.1) [48]. The number of people who eat sufficient quantities of fruit and vegetables is particularly low in the younger age groups.

Fruit and vegetables are key features of a healthy overall diet, which should be varied and low in fats. Vegetable oils and fats

contain a high percentage of unsaturated fatty acids, which can help prevent cardiovascular diseases. This is why they are preferable to animal fats. Such recommendations as these can be put into effect by adopting, for example, a so-called Mediterranean diet, which, in addition to many other advantages, involves a regular fish intake. The favourable health effects of such a diet have been indicated in several studies [51, 52] – apart from which a Mediterranean diet tastes delicious.

The daily intake of water should be 2.6 to 5.2 pints (1.5 to 2 litres), which is what both men and women do drink on the whole. Only people over the age of 65 frequently drink too little. Water and coffee constitute the larger proportion of liquid intake here in Germany.

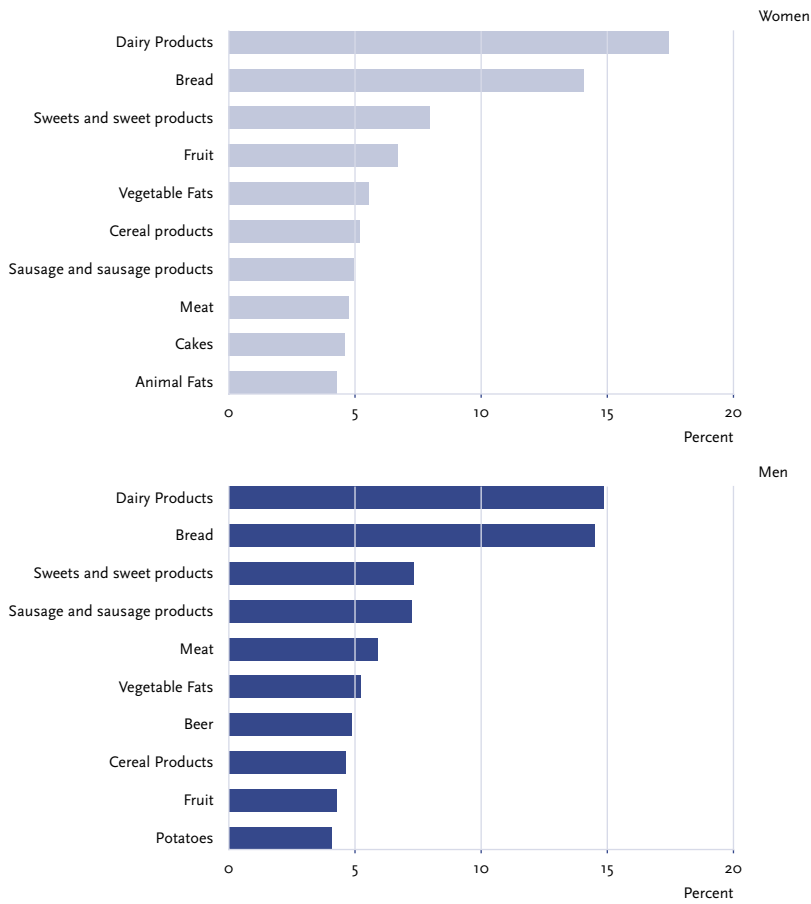
**The main energy input for Germans comes from dairy products, bread and sweets.** The main sources of energy in Germany are milk and dairy products (see Figure 2.3.2), which is desirable in terms of the required intake of calcium and some vitamins. At the same time, full-fat dairy products contribute to a high intake of saturated fatty acids.

While bread is the second most important source of energy for both men and women, other cereal products play a comparatively minor role here. For men, cereal products come after sweets and confectionery, vegetable fat, sausages and sausage products, meat and beer as suppliers of energy; for women they rank behind sweets and confectionery, vegetable fats and fruit. The high consumption of sweets and confectionery is problematic insofar as it scarcely helps to cover the requirements of essential nutrients. The large quantities of sausages, sausage products and meat that men consume are also unfavourable to health, since they involve a high intake of saturated fatty acids and cholesterol.

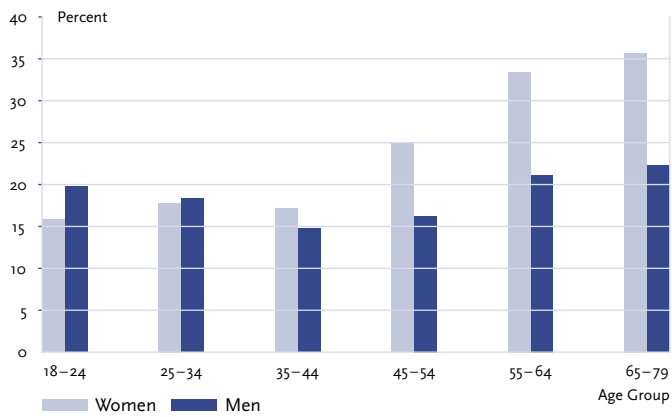
According to data from the 1998 Nutrition Survey, more bread, fruit, fish, sausages and sausage products are consumed in eastern Germany, but fewer cereal products, pasta, confectionery and leaf vegetables than in western Germany. East Germans also drink less tea and water than west Germans. While men in eastern Germany consume more cakes and biscuits, beer and refreshing drinks, but less wine and fewer vegetables than men in western Germany, east German women do not consume as many bakery products, potatoes and animal fats as west German women. However, there is no discernible pattern of healthier eating in western Germany compared to eastern Germany or vice versa [53].

**German diet became healthier in the 1990s.** Dietary behaviour improved in Germany, at least in part, in the period between the so-called VERA study of 1987/88 and the 1998 National Health Interview and Examination Survey. During this period consumption of fruit and vegetables rose significantly; similarly, more fibre- and carbohydrate-rich food and non-alcoholic drinks were consumed [50, 52]. These more favourable dietary habits may have been encouraged in part by improved information about eating and diet in recent years; they are also very possibly the result of changed values and priorities, heightened consumer awareness, and changes in the kinds of foodstuffs that are generally available. For example, more low-fat products are on offer today than in the past.

A comparison of the data from the National Health Surveys of 1990/92 and the Nutrition Survey 1998 shows that in many respects there are no longer any differences in dietary behaviour between western and eastern Germany [51]. Whereas east German men were eating cooked or raw vegetables or meat less frequently than west German men in 1990/92, by 1998 this difference had almost disappeared, although the proportion of



**Figure 2.3.2:** Main sources of nutritional energy in Germany.  
Source: National Nutrition and Diet Survey 1998



**Figure 2.3.3:** Regular consumers of supplements by age and sex.  
Source: National Nutrition and Diet Survey 1998

men who consume bread, cakes, biscuits, fresh fruit, sausages and ham on a daily basis, or almost on a daily basis, remains higher in eastern than in western Germany.

In 1990/92 women in eastern Germany were consuming fewer breakfast cereals, cooked or raw vegetables, yoghurt and cream cheese than women in western Germany. By 1998 this difference no longer existed. In both survey periods, east German women were consuming more bread, fresh fruit, sausages and sausage products.

Comparison of the results of the German nationwide surveys with those of international studies are not easy, mainly due to differences in survey instruments and sampling designs. However, since the earlier surveys were conducted, various programmes have been launched aimed at harmonizing nutritional indicators and survey methods (EFCOSUM [54, 55], DAPHNE project [55]).

**Today, food is expected to be quick, convenient and healthy.** The food industry has reacted to the growing number of people living alone and to changes in job patterns by offering an increasing amount of so-called convenience foods, a trend that has been further encouraged by technical progress in the manufacture of food.

The annual turnover in fast food in Germany rose from €2 billion to almost €6 billion during the 1990s, while the amount spent on meals in restaurants remained constant at €50 billion [56]. Sales of packaged frozen foods rose significantly – by about 103 percent [57] – between 1988 and 1998. In 2001, ready-made meals and side-dishes had risen from 8.2 percent in 1998 to 9.2 percent of the total frozen-food market share (GfK Panel Services Consumer Research GmbH).

Many consumers are paying increasing attention to the health aspects of their purchases when they buy food these days. This is evident from the growing supply and rising sales of functional foodstuffs that are advertised as promoting good health. Functional dairy products have enjoyed especially strong growth rates, with a market volume in the retail food trade of about DM 10 million (€5.1 million) p.a. in 1995, rising to DM 519 million (€265.3 million) p.a. in 1999 [58]. The probiotic yoghurt market share of total yoghurt turnover rose from 9 to 17 percent between 1998 and 2001 (GfK Panel Services Consumer Research GmbH).

Sales of nutritional supplements have developed similarly [59]. According to data from the Nutrition Survey 1998, about 25 percent of women and 18 percent of men in Germany take vitamin or mineral supplements at least once a week, with older women taking the most and men between the ages of 35 and 44 the fewest supplements (see Figure 2.3.3).

Although nutritional supplements can certainly be of benefit in specific situations in life, for example during pregnancy and breast-feeding or in advanced age, a normal diet covers the nutritional requirements of most people most of the time. In

the case of vitamins A, D and E an excessive consumption of supplements, especially when combined with a high intake of fortified food, can actually be detrimental to health.

### 2.3.2 Supply with nutrients

**Germans consume too much animal fat.** On average, and in most age groups, Germans obtain enough energy from their diet. Most cases of low energy intake are to be found among the elderly or young women.

Between 1987/88 (VERA Study) and 1998 (Federal Health Survey) the proportion of fat in nutritional intake fell from about 40 to 33 percent, although some age groups remain in which 10 to 15 percent of the adults obtain over 40 percent of their energy from fats.

The hidden fat content in milk and dairy products is the most significant element in fat intake, followed by spreads, dripping and cooking fat, sausages and sausage products. The nutritional ratio of saturated fatty acids, present especially in animal fats, to unsaturated fatty acids, should be in the region of 1:2, but is currently 1:1.2 in Germany, which means that Germans are consuming too much animal fat.

The consumption of animal products that contain fat involves the intake of cholesterol. Most middle-aged women and most men consume more than the recommended 300 milligrams (0.018 oz.) of cholesterol a day. Men between the ages of 18 to 24 have the highest cholesterol intake at 450 milligrams a day.

The protein intake of the majority of men and women in Germany lies within the recommended limit of 0.8 to 2 grams of protein per kilo of body weight. About a quarter of all men between the ages of 18 and 24 consume more. Women's average protein intake is significantly lower than men's.

Total energy intake should consist of at least 50 percent carbohydrates. This recommendation is complied with by less than half of the population. Fibre intake has been rising in recent years, but the majority of adults still do not reach the recommended target of 30 grams per day.

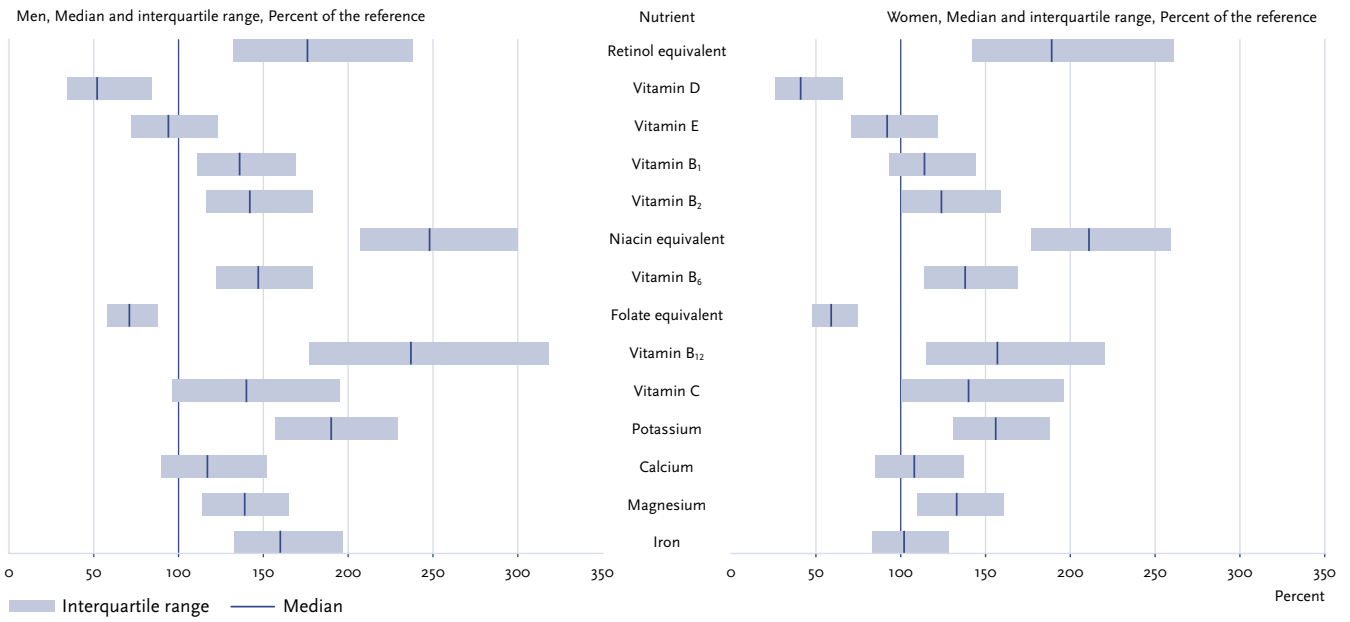
**Folic acid deficiency during pregnancy can lead to the malformation of the embryo.** Germans' dietary intake of vitamins and mineral nutrients can be assessed by comparing the so-called median values and interquartile ranges with the respective recommended reference values (100 percent) (see Figure 2.3.4). If the median value lies on the 100 percent axis, this means that the nutritional intake of half the population is above the current reference value and half below it. The rectangular bars representing the interquartile range give a mean range of dispersion containing the quantities consumed by 50 percent of the population, which means that in each case 25 percent consume more and 25 percent consume less of the given nutrient. However, falling below the reference value does not automatically signify a dietary insufficiency, let alone nutritional deficiency. This is because the reference quantities tend to be set quite high, so that the requirements of almost all healthy persons are covered. In individual cases it is quite possible that the quantity of nutrients is sufficient.

On the whole, it is apparent that people's intake of most vitamins and mineral nutrients is sufficient in Germany. The intake of vitamin D and folate in both men and women is below the recommended levels. Folic acid is important for numerous metabolic processes in the organism, among others for cell division and cell growth. A folate deficiency in an embryo can cause

#### Definition

A convenience product is defined as a foodstuff which is supposed to save time and work. This includes pre-prepared foods such as frozen foods, mixed salads, ready-made meals and preserves, as well as take-away meals and home-delivery services. The increased consumption of fast food is part of the trend to convenience food.

Functional food is defined as food to which nutritional compounds have been added or from which they have been extracted, in order to boost the health value. Examples of this increasingly prolific group of foodstuffs are ACE drinks, wellness beverages, energy drinks, probiotic yoghurts and margarine-type spreads based on plant sterols.



**Figure 2.3.4:** Nutrient intake in comparison to reference values.  
 Source: National Nutrition and Diet Survey 1998

the neural tube to fail to close properly (spina fida – «open spine»). According to the folic acid study carried out in as part of the 1998 National Health Interview and Examination Survey, the folic acid level in 87 percent of women between 18 and 40 years of age was below optimum [60].

Vitamin D intake is also too low in many cases. This is especially the case among 18- to 24-year-olds. Although vitamin D can be created by the body, this can only be guaranteed if sufficient solar radiation has made contact with the skin. The intake of vitamin E among a large section of the population, especially women, is also below the recommended level for appropriate nutritional intake.

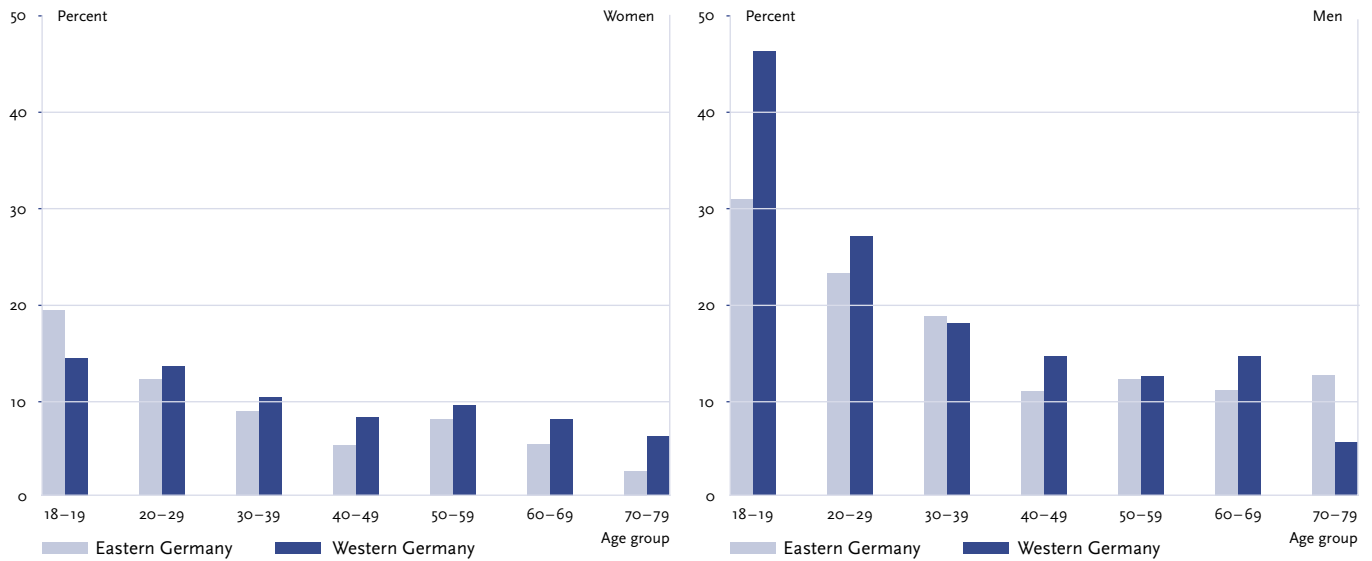
Most adults have sufficient calcium in their diet, but differentiation according to age shows that the intake of calcium and vitamin D, which can prevent bone brittleness, is not sufficient among 65- to 79-year-old women. Iron intake is below the reference value in the diet of more than half of women. Iron requirements are higher during pregnancy and breast feeding and at times of heavy menstrual bleeding.

***Iodine deficiency is becoming less and less of a problem.*** Germany is an iodine-deficient region because the soil contains no (or almost no) iodine, with the result that trace elements are lacking in a normal diet. Persistent iodine deficiency leads to thyroid diseases and is the cause of severe development disorders in children. Changes to the relevant legal framework by the federal government made it possible to introduce iodised salt as a prophylactic on a voluntary basis; the second iodine regulation of 1993 laid the foundation for the widespread use of iodised table salt. Up to the present day, iodised salt has reached levels of 80 percent in private households, 60 to 85 percent in the grocery, meat and confectionery trade, 35 to 40 percent in the food industry and 70 to 80 percent in community catering and gastronomy [61].

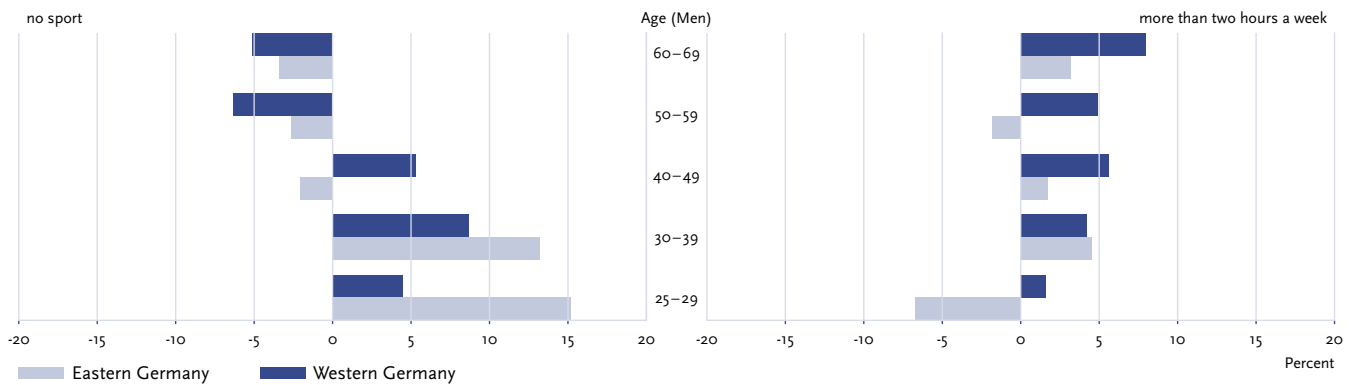
The most recent major study to appraise nutritional iodine intake in Germany, the Iodine Monitoring Study of 1996, revealed a definite improvement in the situation compared to the results of earlier surveys, although it revealed an array of remaining deficits [62]. Nutritional iodine intake in 1996 was shown to be insufficient for 62 percent of young men, 55 percent of mothers who had taken iodine supplements during pregnancy, and 81 percent of mothers who had taken no such supplements. The report also revealed below-optimum values in 75 percent of newborns, 58 percent of elderly men and 51 percent of elderly women.

According to recent studies, iodine deficiency in prepubescent children is no longer a serious problem in some regions of Germany [63–67]. On the other hand, pregnant women and breast-feeding women still constitute a risk group [63]. Up-to-date and representative data on iodine intake in Germany are expected when the Survey on the Health of Children and Adolescents (KiGGS) is completed.

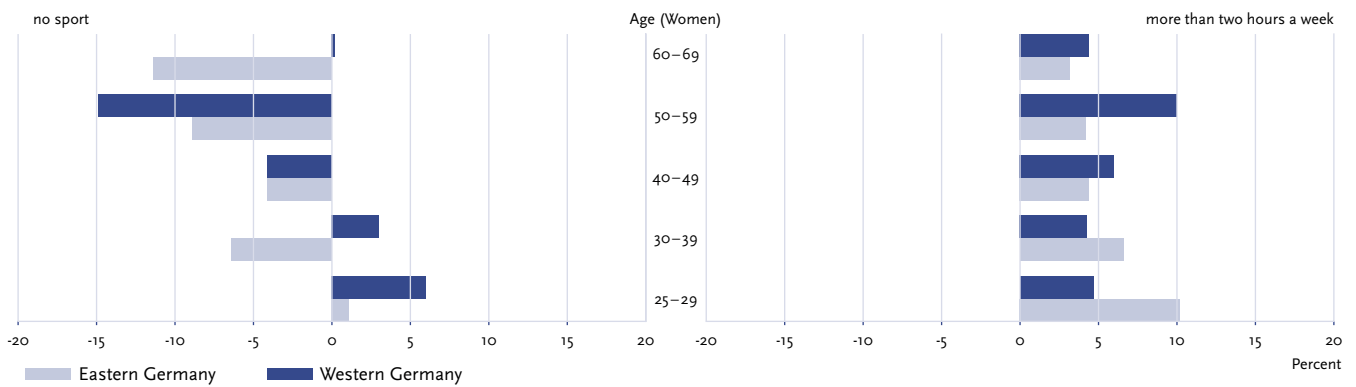
► Comprehensive Information on diet and nutrition is to be found in the contribution for the Federal Health Reporting “What are we eating today?” [49]



**Figure 2.4.1:** Proportion of the population attaining the currently recommended levels of physical activity. Source: National Health Interview and Examination Survey 1998 [68]



**Figure 2.4.2:** Changes in sporting activities among men between 1991 and 1998. Source: National Health Survey 1990/91, National Health Survey (East) 1991/92 and the National Health Interview and Examination Survey 1998 [68]



**Figure 2.4.3:** Changes in sporting activities among women between 1991 and 1998. Source: National Health Survey 1990/91, National Health Survey (East) 1991/92 and the National Health Interview and Examination Survey 1998 [68]



## 2.4 Physical activity

### ► Abstract

Regular physical activity improves people's quality of life, prevents the development of various complaints and promotes therapy and rehabilitation for many diseases. The preventive potential of physical activity is being paid particular attention because there is a perceptible lack of physical activity in general in Germany [68, 69]. In 1998, only 13 percent of adults managed to do some physical activity for at least half an hour 3 times a week, which is the recommended amount of time for promoting health.

On the whole younger people are more physically active than older people.

The age-specific counter-trends in sports practice are interesting. Between 1991 and 1998 there was an increase in the proportion of men and women between 25 and 40 who did not practise any kind of sports at all. By contrast, the proportion of physically inactive people in the 50–70 age group actually declined. This may well be a result of health-information campaigns and improved sports opportunities for the elderly.

According to data from the 2003 Telephone Health Survey, about one third of people over 18 currently practise sports for at least two hours a week, while one third practise no sports at all. Lack of exercise is more marked in socially disadvantaged groups than among the more privileged.

**Exercise increases the quality of life and reduces the risk of ill-health.** Regular physical activity reduces the risk of numerous complaints, such as cardiovascular diseases, type 2 diabetes, bowel cancer, osteoporosis, back pains and overweight [71–74]. Furthermore, physical activity promotes the treatment and rehabilitation process of these and other diseases and reduces accompanying complaints. Finally, people who are physically active on a regular basis are less likely to die prematurely [75].

Physical activity has a positive effect on health at every age. It also plays an important role in the physical, psychological and social development of children and adolescents. In all likelihood, the elements that lead to an active lifestyle are fixed in early years.

The health-promoting effect of physical activity is given even if a person's previous everyday life was characterized by a lack of it. Since most people are sedentary at work, at home and during their leisure time for longer periods than they used to be, and since there are growing indications that children and adolescents are not physically active enough, there is a need for programmes to promote physical exercise among both young and old.

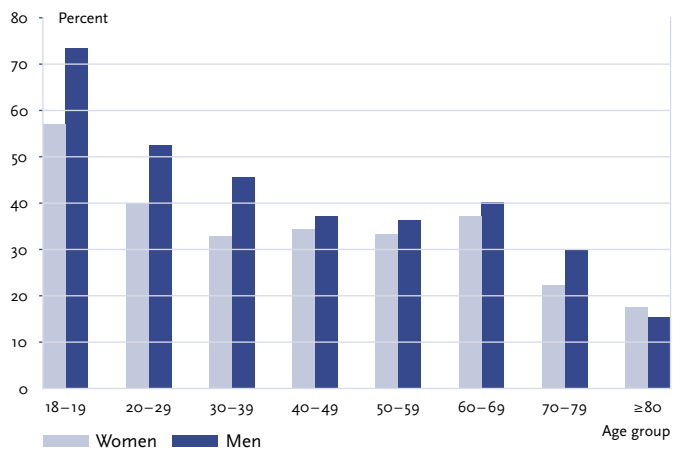
**Only 13 percent of adults devote the recommended minimum amount of time to physical activity.** Almost without exception, Germans are not physically active enough. It is currently recommended that at least three days a week (or better still, every day of the week) should be given over to some physical activity which causes the pulse rate to rise, breathing to become heavier and a light perspiration to break out. This recommendation is not primarily aimed at muscle development or improving sporting stamina, but at the general promotion of health and well-being. Endurance sports such as running, swimming, cycling, rowing and cross-country skiing are regarded as appropriate, but even half an hour's energetic walking every day can achieve positive health results for people who are out of practice [68, 76]. Yet only a small proportion of the population actually manages to do as much as this (see Figure 2.4.1).

According to data from the 1998 National Health Interview and Examination Survey (BGS98), only 13 percent of the adult population are physically active at least three times a week for half an hour at a time, as recommended. Only among young adults, especially young men, is the percentage of people engaging in sufficient physical activity higher. Among older people the percentage drops below 10 percent. Yet physical activity is crucial for health and mobility and thereby for an independent lifestyle, especially in advanced age [77].

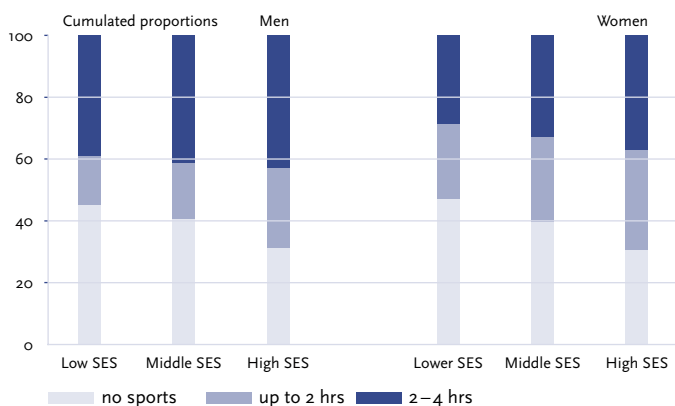
The physical activity level for women in all age groups is lower than that of men, according to their own statements in the BGS98. This can be at least partly explained by the fact that women carry out a greater number of everyday tasks which are wholly compatible with the recommended level of weekly phys-

### Definition

Physical activity is any bodily movement produced by skeletal muscles that substantially increases energy expenditure. The following physical activities can be distinguished according to their effects (increase in strength and stamina) or aims: job-related, transport-related, household-related or leisure-related physical activity. Physical training refers to a planned, structured and regular activity intended to improve or maintain physical fitness. Physical fitness or capability is influenced not only by the nature and extent of physical activity, but also by genetic factors, lifestyle and the prevailing state of health. Sport refers to activities performed within the framework of a competition or game, or which serve the purposes of health promotion and recreation [70, 71].



**Figure 2.4.4:** Proportion of men and women who practise sport for two and more hours a week, by age group. Source: Telephone Health Survey 2003 [78]



**Figure 2.4.5:** Extent of sporting activity by socioeconomic status (SES). Source: Telephone Health Survey 2003 [82]

ical activity, but which they do not recognize or record as such. This would include for instance, shopping, playing with children, housework and gardening.

**Participation in sports is falling among younger and rising among older persons.** The number of 25- to 40-year-old men and women who do not practise any sporting activity rose between 1991 and 1998, but the reverse trend has been observed for 50- to 70-year-olds (see Figures 2.4.2 and 2.4.3).

The reverse trend among older persons can partly be explained by the increase in the availability of sports programmes specially aimed to meet the needs of older people [78]. Information tailored specifically for older people and greater health awareness may have contributed to the higher sports participation rate of the 50–70 age group.

Another remarkable fact is that the percentage of those in almost every age group who practise more than two hours of sports a week rose between 1991 and 1998, the only exception to this trend being east German men between 25 and 29 years of age and between 50 and 59 years of age.

The 2003 Telephone Health Survey provided up-to-date data on sports participation. According to these data, 37.4 percent of men and 38.4 percent of women above the age of 18 practise no sports whatsoever. A further 20.9 percent of men and 28.4 percent of women are active in some kind of sports for less than two hours a week. The remaining 41.7 percent of men and 33.2 percent of women state that they are physically active for two or more hours a week [78]. The proportion of such relatively highly active persons is highest in early adulthood. Only small variations can be observed in middle-aged people. Participation rates in sporting activities fall quite sharply after that, at the latest from the age of 70. (see Figure 2.4.4).

**The Germans are fond of their sports clubs, which doesn't always mean that they are active.** The proportion of people who are members of sports clubs in Germany is considerably higher than the proportion of the population who are sufficiently physically active, which suggests that there is a large number of passive club members. Membership of a sports club is proof of an interest in sports rather than of any sporting activity and, of course, sports clubs' members are only a part of the total population. According to data from the German Sports Federation, it is above all children and young people between 7 and 18 years of age who are in sports clubs. 30 to 40 percent of men and just over 20 percent of women are members [79].

Membership of a sports club in no way guarantees a given level of sporting activity, particularly as far as women are concerned. For one thing, many women practise sports in other ways, for example in gyms or in evening courses. Secondly, women attribute a different importance to sports than men do, in terms of how they see both themselves and their role. This could be reflected in the information they provided themselves on the nature and extent of their participation in sports; not to mention that many survey tools on sporting activities were developed specifically for male study groups [80, 81].

**Socially disadvantaged persons do less sport.** A larger proportion of people from the lower classes, both men and women, do not practise any sports; in turn, middle-class people do less sports than higher-class people (see Figure 2.4.5). One reason for the difference may lie in the fact that people in the higher social stratum spend their working day sitting down and are therefore likely to practise sports with the specific intention of compensating for this. The fact that some kinds of sports involve a considerable financial outlay may play a role, too [68, 79].

All in all, the level of physical activity and participation in sports has risen in recent years among some sections of the population, a fact that can be attributed to health information campaigns and new opportunities to take physical exercise. Yet the message has certainly not reached all sections of the population, which means that much more needs to be done. In addition to sports clubs, places suitable for motivating others to become more active and engage in sports include schools, nursery schools and companies both large and small. No amount of effort to influence personal behaviour will succeed, however, unless it is accompanied by structural measures such as the maintenance, modernization or creation of swimming pools, sports grounds, sports halls and playing fields, as well as parks and green spaces. Equally important are urban measures which allow children as well as adults to move around the city on foot or by bicycle without danger.

► Comprehensive Information on **physical activity** can be found in booklet 26 of the Federal Health Reporting's series [69] and a contribution to the Federal Health Reporting: **Federal Health Survey: Physical Activity** [68].

	Women					Men				
	18–29	30–44	45–64	65+	Gesamt	18–29	30–44	45–64	65+	Gesamt
Regular smoker	33.6	29.3	22.0	5.1	21.9	39.3	36.0	26.1	11.8	29.2
Occasional smoker	11.0	7.4	5.3	2.4	6.1	14.4	8.3	6.9	3.8	8.1
Former smoker	14.6	24.1	25.5	21.2	22.3	14.7	23.9	38.2	52.1	31.8
Never smoked	40.8	39.2	47.2	71.3	49.7	31.5	31.8	28.8	32.4	30.9

**Table 2.5:** Percentage of regular smokers, occasional smokers, former smokers and persons who have never smoked, by gender and age (in %). Source: Telephone Health Survey 2003 [88]

## 2.5 Tobacco and alcohol consumption

### ► Abstract

**One in three adults in Germany smokes and almost one in ten adults is a heavy smoker; between 110,000 and 140,000 deaths a year are linked to the consequences of tobacco consumption. Whilst tobacco consumption among men has declined slightly since the mid-1980s, it has increased among women, so that the gender differences in smoking patterns are decreasing. The proportion of smokers in the 12–25 age group fell between 2001 and 2004 from 37 to 35 percent and the percentage of heavy smokers in this group from 19 to 12 percent. On the other hand, young Germans are the heaviest consumers of tobacco in Europe.**

**In Germany one woman in six and one man in three consumes alcohol in quantities that increase the risk to their health. Alcohol consumption is at least a partial cause of about 40,000 mortalities every year.**

**Total alcohol consumption is falling among adults and 12- to 25-year-olds; but so-called “binge drinking” – deliberate drinking to intoxication on special drink-centred occasions – poses a growing problem. Alcoholic mixed drinks (alcopops) have contributed considerably to alcohol consumption among young people over the last ten years.**

### 2.5.1 Tobacco consumption

**Smoking is the biggest health-risk factor of all.** In the industrialized countries, no single factor causes more damage to health than tobacco consumption. In Germany, between 110,000 and 140,000 people die every year of smoking-related illnesses [83, 84]. These include heart diseases, cerebrovascular diseases, high blood pressure, arteriosclerosis, pneumonia, chronic bronchitis as well as malignant tumours of the lung, bronchia, oral cavity, oesophagus, kidney and pancreas [85, 86]. Smoking can also lead to genetic alterations; it weakens the body's defences and exacerbates existing complaints.

**One in three adults in Germany smoke.** According to data from the RKI's 2003 Telephone Health Survey, about a third of people aged 18 or over in Germany are smokers; 25.4 percent smoke daily and 7.1 percent occasionally. A further 26.9 percent used to smoke, so that almost 60 percent of the German population smoke or used to smoke [88].

Taking the daily and occasional smokers together, 28 percent of women and 37.3 percent of men aged 18 and over currently smoke (see Table 2.5). Half of all the women in the survey have never smoked, a fact that applied to just under a third of the men. The data also showed that the percentage of both female and male smokers falls with age.

Most consumers of tobacco prefer cigarettes. About 92 percent of male smokers and 99 percent of female smokers only or mainly smoke cigarettes. Other tobacco products, such as cigars, cigarillos or pipe tobacco, are also quite popular, but only among middle-aged or older men.

The Epidemiological Survey on Addiction of the Institute for Therapy Research (IFT) provides similar figures according to which 37.1 percent of men aged between 18 and 59 and 30.5 percent of women of the same age are smokers [89]. The micro-census of 2003 recorded lower prevalence rates of 33 percent for men and 22 percent for women over the age of 15. The differences should be seen against the background of different survey methodologies [90].

**Almost every tenth adult is a heavy smoker.** The World Health Organization designates a person as a heavy smoker if he or she smokes 20 or more cigarettes a day. This designation applies to 39.6 percent of daily smokers here in Germany, so that 9.4 percent of the Germany population over 18 years of age are heavy smokers; 27.4 percent of daily smokers (6.6 percent of the adult population) consume 11 to 19 cigarettes a day and are designated medium smokers.

More men than women smoke 20 or more cigarettes a day (31.2 percent of female daily smokers as opposed to 47 percent of male daily smokers). The largest proportion of heavy smokers is to be found in the 50 to 59 age group, namely 66.1 percent of male smokers and 41.0 percent of female smokers [91]. One reason for this is that nicotine dependence increases over time, and an ever stronger intake becomes necessary to achieve the same effect. According to data from the Epidemiological Addiction Survey of 2003, about 40 percent of smokers in the 50–59 age group are addicted to nicotine, while only 22 percent of smokers in the 18- to 20-year-old age group are nicotine addicts [89]. The fact that the proportion of heavy smokers declines when they reach an advanced age is related to the higher morbidity and mortality rates that accompany heavy smoking [88].

**Passive smoking is as prevalent as ever.** Passive smoking can also damage health. The range of illnesses associated with passive and active smoking is much the same. It has been proved, for example, that the incidence of lung cancer, heart disease, strokes and respiratory diseases is increased by passive smoking [85, 86].

The reason for this is to be found in what is known as “side-stream” smoke, which is emitted into the surroundings and contains more carcinogenic substances than “mainstream” smoke, which is inhaled during active smoking. Children and adolescents are particularly at risk when their parents smoke at home, but adults are also at risk when they live or work alongside smokers, for example. New studies have shown that in Germany almost every second child is a passive smoker at home [92, 93]. The protection of non-smokers from tobacco smoke is therefore an important aspect of health protection and tobacco-control policy [94].

In Germany almost one in four non-smokers lives with at least one person who smokes. However, at the same time only every sixth person states that there is a smoker in his or her household. The proportion (around 50 percent) of non-smoking households of the 25 to 69 years of age has hardly changed over the last ten years [95].

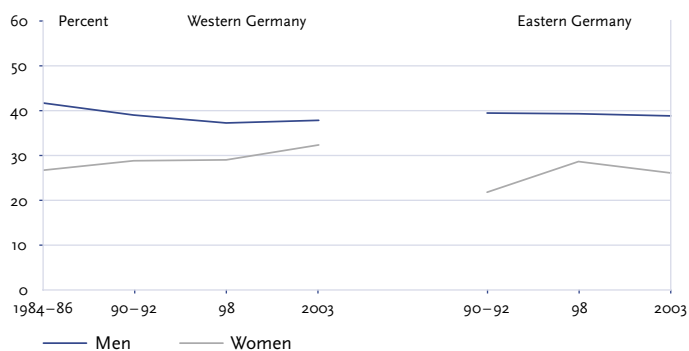
According to the 2003 Epidemiological Survey on Addiction, about a quarter of non-smokers who are in employment or in training are exposed to tobacco smoke on a daily basis at their workplace, and a further 15 percent one to three times a week.

### Detection of carcinogens

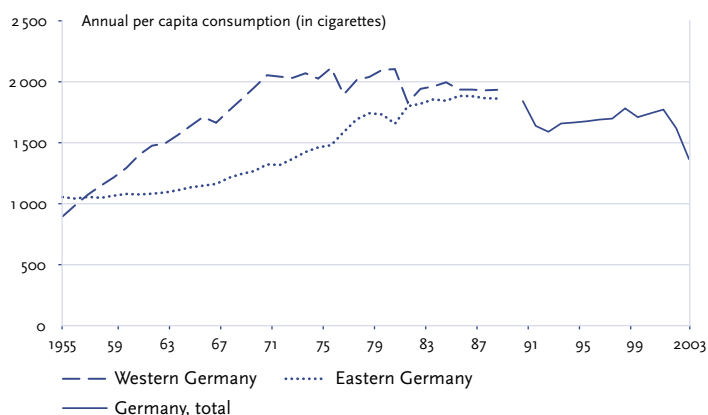
Carcinogenic substances that originate from tobacco smoking or which are contained in tobacco can be detected in urine. On average, concentrations of polycyclic aromatic hydrocar-

bons (PAHs) detected in the urine of smokers are twice those found in non-smokers' urine [41]. Smoking five cigarettes increases contamination by 85 percent compared to non-smoking [87]. Benzene contamination of indoor air

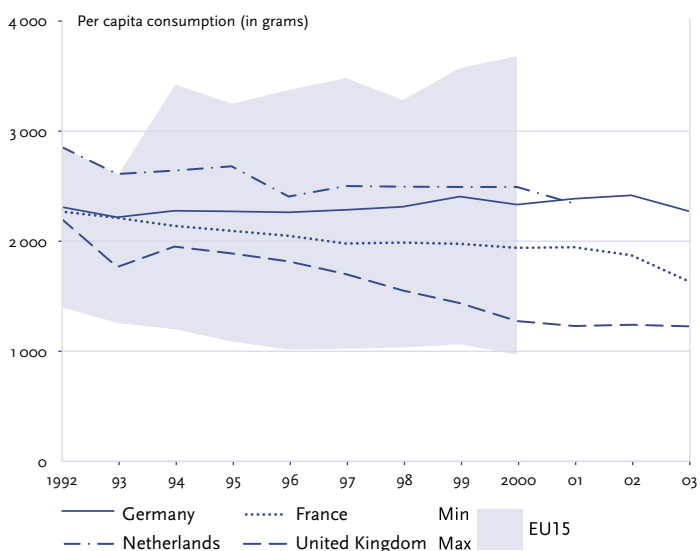
is markedly higher in the households of smokers than in non-smoking households. The EU toxicological limit of 5 µg/l for benzene in ambient air was significantly exceeded in individual cases.



**Figure 2.5.1:** Trend of smoking prevalence in the German population among 25 to 69 years olds between 1984 and 2003 (in percent). Source: Telephone Health Survey 2003 and previous health surveys carried out by the Robert Koch Institute [88]



**Figure 2.5.2:** Annual per capita cigarette consumption in Germany 1955 – 2004. Source: Federal Statistical Office: Theme series 14: Finances and Taxation, Sub-series 9.1.1 Turnover from tobacco products [98]



**Figure 2.5.3:** Tobacco consumption in the population (15 years and older) in selected OECD member states 1992 – 2003. Source: OECD Health Data October 2005

Almost two-thirds of non-smokers are very disturbed by other people smoking in their presence. More than three quarters of non-smokers try to avoid places where many people smoke [89]. Section 5 of the new workplace regulations dated 12 August 2004 deals with the protection of non-smokers and obliges the employer to take such measures as may be necessary to effectively protect non-smokers from the health dangers of tobacco smoke at the workplace.

**The smoking habits of men and women are becoming increasingly similar.** The proportion of men who smoke has decreased slowly since the mid-1980s. The proportion of smokers among women, however, has risen (according to data from the RKI Health Survey [91]) or has hardly changed (according to data from the 2003 Epidemiological Addiction Survey [89]). These are the factors leading to an increasing similarity in smoking habits between the two sexes.

According to the data supplied by the RKI Health Surveys, the national average number of female tobacco consumers declined slightly in the early 1990s, a fact explained by the initially lower proportion of female smokers in eastern Germany (see Figure 2.5.1). In view of the growing proportion of women in employment and the increasingly similar lifestyles of men and women, it can be expected that the differences between men and women with regard to smoking will continue to narrow [88, 91]. As has been made clear by the Drug Affinity Study produced by the Federal Centre for Health Education, there are hardly any discernible differences in the smoking habits of adolescents and young adults [96, 97].

More information about trends in tobacco consumption is provided by the annual tobacco products statistics. 111.8 billion cigarettes were smoked in Germany in 2004. The figure was about 16.3 billion lower in 1993. Whereas annual cigarette consumption had risen between 1999 and 2003, it has been falling since 2003, a development that is also reflected in the trend for per capita consumption (see Figure 2.5.2), which was 1,355 cigarettes in 2004 [98]. It is likely that the per capita consumption was actually higher than that, since smuggled cigarettes do not appear in these statistics. According to a study commissioned by the cigarette industry and carried out by the T.Ü.V. (Technical Control Board), 10 percent of cigarettes smoked nationwide were imported into the country illegally [99].

**The smoking rate among German adults is close to the EU average.** By comparison to other European countries, tobacco consumption in Germany is near the EU average, as indicated by data from the OECD on annual per capita consumption levels (in grams). The figure for Germany has shown little change over the last ten years and currently stands at about 2000 grams. Considerably higher levels have been recorded, notably in Greece, but more tobacco is consumed in Germany than in most of the neighbouring states according to the statistics. The UK is especially noteworthy in this respect – per capita consumption there fell from about 2,200 to 1,200 grams between 1992 and 2003 (see Figure 2.5.3).

**The smoking rate among young Germans is one of the highest in Europe.** Tobacco consumption rates among young people in Germany do not present such a favourable picture by international comparison. According to data from the Drug Affinity Study, the percentage of smokers in the 12- to 17-year-old group fell from 27 to 21 for boys and from 29 to 19 for girls between 1997 and 2005, bringing the figures down to 1993 levels [96]. According to the international study “Health Behaviour in School-age Children” (HBSC), which supplied data on 35 European countries and regions, the percentage of 13- to 15-year-olds

smoking in Germany is still higher than in any other country covered by the study [100].

Data from the European School Survey Project on Alcohol and other Drugs (ESPAD) conducted in 2003, which studied pupils in their ninth and tenth years at school, show that 44.9 percent of the youths and 48.4 percent of the girls had smoked during the 30 days prior to their interview. More than three quarters stated that they had smoked a cigarette at least once in their lives. The figures differed according to the type of school attended. The proportion of smokers (prevalence within 30 days) was noticeably lower among grammar-school children (36.5 percent) than among those attending a secondary school (50 percent) or lower secondary school (56.6 percent) [101].

These data underline the need for a long-term prevention and control policy, beginning in the children's early years and aimed at preventing young people from starting to smoke in the first place. In cases where young people have started to smoke, the aim should be to support them in their attempts to give it up and also offer them better protection from passive smoking. Important points of departure in this respect are the projects of the Federal Centre for Health Education aimed at improving social competence and preventing addiction [102, 103].

## 2.5.2 Alcohol consumption

**About 40,000 mortalities a year are associated with risky consumption of alcohol.** Along with tobacco consumption, alcohol abuse poses a serious addiction problem in Germany. Excessive alcohol consumption is a predisposing factor in various disorders such as cirrhosis of the liver, heart-muscle diseases, brain damage and damage to the peripheral nervous system, as well as inflammations and pancreatic cancers. Alcohol is also often revealed be a contributory factor in accidents, acts of violence and suicides. Alcohol abuse can disrupt or destroy social relationships and lead to the loss of a person's job and home [104].

In 1995, almost 42,000 deaths in Germany were estimated to have been at least partly linked to alcohol consumption. In about 17,000 of these cases alcohol was the decisive factor [105]. As regards mortalities where alcohol definitely played a role, the age-standardized annual mortality rates for women are 8.3 per 100,000 persons in western Germany and 16.7 per 100,000 persons in eastern Germany. For men, the corresponding rates are 26.5 in western Germany and 65.1 in the east [105]. It is estimated that there are 1.6 million adult alcoholics in Germany [106].

The healthcare system for alcoholics in Germany is by and large well developed with both inpatient and outpatient services available, but more could be done to integrate addiction treatment into primary medical care.

Primary and secondary prevention of alcoholism are among the key duties of the Federal Centre for Health Education and the German Centre on Addiction Issues, which for many years now have been organizing and coordinating sustainable prevention measures for specific target groups aimed at combating alcohol abuse.

The suggestion first made in the 1970s that moderate alcohol consumption might have a protective value against cardiovascular diseases is now generally accepted, but the extent of protection varies from one person to another (depending, for example, on age, lifestyle and genetic factors) and is altogether of fairly limited significance. It should also be borne in mind that, despite any possible protection against cardiovascular disease, even moderate consumption of alcohol is always accompanied by other health risks [107].

**Alcohol consumption has fallen slightly since the early 1990s.** Information on the per capita consumption of alcoholic drinks is provided by the consumption statistics. These are an important indicator of the alcohol-related health problems to be expected in a given population. When making international comparisons, it should be borne in mind that the varying degree of smuggling, illegal distilling and exports of alcohol by tourists, among other aspects, in different countries means that the statistics from different countries are not directly comparable.

In 2003, the alcohol consumption rate in Germany was 14.7 litres or 10.2 litres of pure alcohol, more than half of which was consumed in the form of beer. Wine and spirits each made up a fifth of total consumption [107]. Per capita consumption (calculated in terms of pure alcohol consumption) almost quadrupled between the 1950s and the early 1990s. The per cap-

### Data basis

In Germany informative data on tobacco consumption and passive smoking is provided by the following organizations: the Institute for Therapy Research (IFT), the microcensus of the

Federal Statistical Office (Destatis), the Drug Affinity Study of the Federal Centre for Health Education, the nationwide health surveys conducted by the Robert Koch Institute (RKI), the nationwide environmental surveys of the Fed-

eral Environment Agency, and the European School Survey Project on Alcohol and other Drugs (ESPAD).

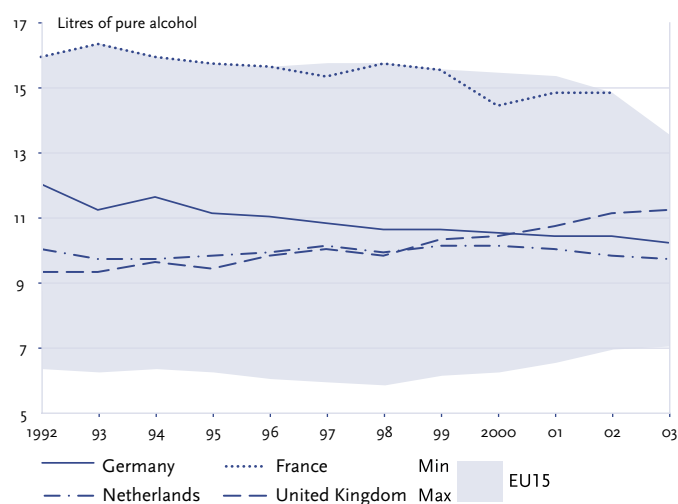


Figure 2.5.4: Alcohol consumption: a European comparison. Source: OECD Health data October 2005

ita consumption rate peaked in 1991 at 12.4 litres, since which time the consumption rate has fallen slightly.

Compared to other countries, Germany has ranked for years as one of the countries with the highest alcohol consumption. Germany ranked eighth among the 58 countries included in the survey conducted by the Dutch Product Board for Distilled Drinks («Productschap Voor Gedistilleerde Dranken») [108]. According to OECD statistics, the consumption rate here in Germany is close to the European average and is not very different from the consumption rate of many neighbouring states (see Figure 2.5.4). A significantly higher per capita consumption rate was recorded for France and Luxembourg and a comparatively low consumption rate for Sweden.

**One woman in six and one man in three drinks amounts that are over the risk threshold.** According to data from the 1998 National Health Interview and Examination Survey, the alcohol quantities consumed by 16 percent of women and 31 percent of men exceed the tolerable upper alcohol intake levels (TUALs) [103, 104]. The German government's Drug and Drug Addiction Report states that 12.3 percent of the population between the ages of 19 and 59 definitely exceed the alcohol-intake threshold, with 1.7 million women in this age group consuming over 20 grams of alcohol a day and 3.8 million men more than 30 grams [103]. This estimate is based on information on interviewees' alcohol consumption during the thirty days before the survey was conducted. Extrapolating the 12-month prevalence rates reported in the Substance Abuse Survey of 2000 gives a total of 10.4 million men and women in Germany between the ages of 18 and 69 who are consuming quantities of alcohol above the risk threshold [109].

The proportion of men and women who consume amounts of alcohol above the TUALs is highest in middle age. However, 11 percent of women and 24 percent of men between the ages of 18 and 24 also exceed the limit [103, 104].

Alcohol consumption among women rises with social position: 9 percent of women in the lower social strata exceed the TUALs, 14 percent of the middle classes and 30 percent of the higher classes. There is not such a distinct correlation between social position and above-TUAL alcohol consumption among men: 35 percent of men in the higher social classes exceed the TUALs, 29 percent in the middle classes and 32 percent in the lower classes [103, 104].

It should be borne in mind when interpreting these figures that the 1998 Nutritional Survey did not contain any data about

#### Definition

Tolerable upper alcohol intake levels (TUALs) are threshold levels of alcohol consumption above which the general risk of ill-health increases for the majority of healthy adults. These levels already take into account the favourable effect on cardiovascular complaints of moderate alcohol consumption. The TUALs in Germany for women are 10 to 12 and for men 20 to 24 grams of pure alcohol a day [104] [110]. The lower of each of these values (10 and 20 grams respectively) was used as the TUAL in the 1998 National Health Interview and Examination Survey. The following amounts of certain beverages contain the indicated quantities of alcohol (10 grams = 0.352 oz., 0.3 litres = 0.527 pints):

0.2	litres of beer	approx.	8 grams of alcohol
0.33	litres of beer	approx.	13 grams of alcohol
0.125	litres of wine	approx.	11 grams of alcohol
0.1	litres of sparkling wine	approx.	9 grams of alcohol
4	centilitres –	approx.	11 grams of alcohol
	(a double measure) of spirits (32% vol.)		

Source: German Centre against the Dangers of Addiction [111] and RKI [104]



the alcohol consumption of the homeless or persons in institutions such as nursing homes, prisons and barracks, and that all the information collected consisted of self-assessments made by the interviewees.

The percentage of women in western Germany whose alcohol consumption is above the TUALs is somewhat higher than in eastern Germany (16 vs. 13 percent). On the other hand, the corresponding ratio for men is higher in the east than in the west (35 to 30 percent).

**Young men drink more frequently than young women.** Drinking habits become ingrained in the course of time and can eventually damage a person's social and mental development, which means that children and adolescents in particular are put at risk by alcohol consumption. Representative data from the 2003 Drug Affinity Study show that 34 percent of the 12- to 25-year-olds drink alcohol regularly – i.e. at least once a week. There are marked gender differences: for example, 35 percent of male adolescents drink beer and 20 percent alcoholic mixed drinks regularly. 8 percent of girls and young women consume beer and 11 percent alcoholic mixed drinks at least once a week. On average, young men drink 96.5 grams of pure alcohol a week, about a quarter of them more than 120 grams. Young women consume an average of 39.2 grams of pure alcohol a week, 8 percent drink more than 120 grams [112].

Data on alcohol consumption among school children have been published in the studies «Health Behaviour in School-aged Children (HBSC)» [113] and the «European Schools Project on Alcohol and other Drugs» (ESPAD)» [101].

**Alcopops have become a favourite among young people in recent years.** First introduced to the European market in 1993, alcopops became an increasingly important part of young persons' drinking patterns during the 1990s [103, 108, 114]. In 2003 in Germany they were being bought by twelve percent of people over 14 years of age. According to the 2004 Drug Affinity Study, which was carried out before the special tax on alcopops was introduced, 39 percent of girls and young women and 45 percent of youths and young men had drunk this alcoholic mixed drink at least once during the month prior to the survey. Seven percent of female and 14 percent of male interviewees between the ages of 12 and 25 were drinking alcopops regularly – that is to say at least once a week [115]. Most consumers of alcopops were aged 16 to 19 years, with 16 percent drinking them at least once a week. No alcoholic beverage was consumed as frequently by young women as alcoholic mixed drinks of all kinds – including alcopops [115].

Alcopops are suspected of setting people on the road to permanent alcohol consumption. In Germany a special tax of 84 cents per 0.275 litre bottle was imposed on alcoholic mixed drinks to try to stem the increasing consumption of alcopops. It also became mandatory to indicate clearly on every bottle that, under the terms of the Youth Protection Act, it is illegal to sell the alcoholic beverage contained in the bottle to any person under the age of 18. The legal obligation to carry warning labelling came into effect on 10th September 2004; the spe-

cial tax was levied on all alcopops manufactured from 2 August 2004 [116].

According to the report from the German government on the results of the special alcopops tax on alcohol consumption patterns, the percentage of young people between the ages of 12 and 17 who drank alcopops containing spirits at least once a month fell from 28 percent in 2004 to 16 percent in 2005 [117]. The percentage of young people who drank alcopops containing wine and beer at least one a month fell from 23 to 21 percent. The consumption of alcopops in powder form is of virtually no statistical significance. Since other forms of alcoholic beverage are drunk in the same quantities as before, the overall amount of alcohol consumed by young people between the ages of 12 and 17 fell from 43.9 grams a week in 2004 to 35.7 grams a week in 2005 [118].

**Half of the 16- to 19-year-olds get drunk at least once a month.** Although the regular consumption of alcohol among the 12- to 25-year-olds has on the whole been declining since the 1970s [115], a significant number of young people are now indulging in what is known as binge drinking: a particularly hazardous form of alcohol consumption.

In the 2004 Drug Affinity Study, 25 percent of the women and 43 percent of the men between the ages of 12 and 25 interviewed confirmed that they had drunk five or more glasses of alcohol in a row at least once in the month before the time they were questioned. In the case of six percent of girls and young women and 14 percent of young males this had happened three to five times in the previous month [115].

Most male and female binge drinkers are 16 to 19 years old: 46 percent drink five or more glasses of alcohol on one occasion at least once a month. Within the framework of the European Schools Survey Project on Alcohol and other Drugs (ESPAD), almost 60 percent of pupils in the ninth and tenth years of school reported that they had consumed five or more glasses of alcohol in a row at least once in the previous 30 days [103].

Binge drinking is prevalent among adults, too. According to results from the 2003 Epidemiological Survey on Addiction, 44.6 percent of the men and 16.1 percent of the women who had consumed alcohol in the previous 30 days had on at least one occasion drunk so much that their drinking could be said to amount to binge drinking. The percentage rates have fallen, however: in 1995 they were 53.7 for men and 25.6 for women [119].

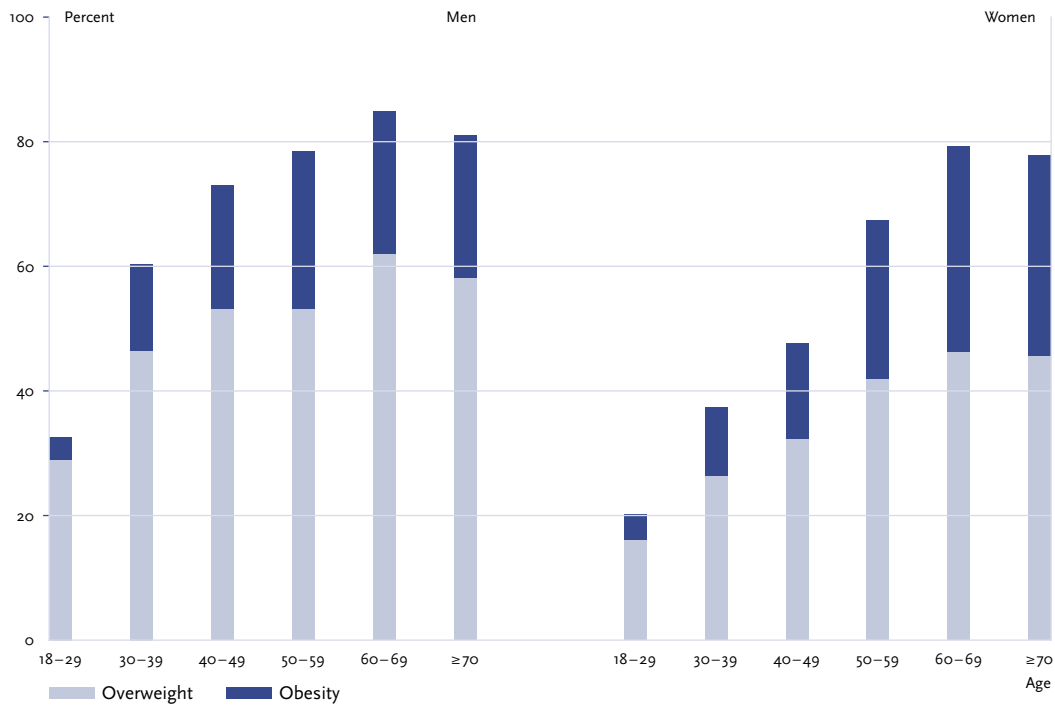
► Comprehensive Information on alcoholism can be found in a contribution to the Federal Health Reporting: **Federal Health Survey – Alcohol** [104].

#### Definition

Alcopops are defined by the German Alcopops Act as ready-mixed sweet drinks containing distilled or spirituous liquor. Their sweet and aromatic quality disguises the typical taste of alcohol, which young people often find disagreeable. They target a youth market in the way they are presented and sold [114]. The expression "alcopop" has subsequently also been used to refer to other ready-made sweet drinks containing wine, beer or fruit wine.

#### Definition

Binge drinking is defined as heavy episodic consumption of alcohol during given drinking sessions. Binge drinking is regarded as a hazardous pattern of drinking, leading in the long-term to a heightened risk of alcohol dependency, while in the short term it may lead to accidents and acts of violence. Episodic bingeing is liable to lead to social problems, and recently it has been hypothesized that binge drinking is a predisposing factor in cardiovascular complaints and increases the likelihood of dying from cardiovascular disease [3].



**Figure 2.6.1:** Prevalence of overweight and adiposity, by age and sex.  
 Source: Telephone Health Survey 2003 [124]

## 2.6 Obesity, high blood pressure and hypercholesterolemia

### ► Abstract

**Overweight, high blood pressure and hypercholesterolemia are among the most important risk factors in the development of cardiovascular diseases and a range of other complaints. In particular, the presence of several risk factors at the same time multiplies the risk of developing an illness many times. Overweight, high blood pressure and hypercholesterolemia originate both in genetic disposition and as a result of individual behaviour.**

**In Germany, about half of men and a third of women over the age of 18 are overweight, not counting a further 17 percent of men and 20 percent of women suffering from obesity, a severe form of overweight. The risk of diabetes and other health risks increase with body weight. The proportion of overweight persons is higher in socially disadvantaged groups. The number of overweight and obese people has risen in Germany since the mid-1980s; there is still no reliable data available on the prevalence of overweight and obesity among children and young persons.**

**High blood pressure (hypertension) is a common illness in Germany, too. About a third of adults in Germany show clear evidence of hypertension, and blood pressure values for many others are marginally raised. One in four people with hypertension is on medication.**

**One man in three and one woman in three in Germany shows clear evidence of high cholesterol levels (hypercholesterolemia). The most frequently affected are women between the ages of 60 and 69. It tends to occur earlier in men, already affecting around 25 percent of the 30- to 39-year-olds.**

### 2.6.1 Overweight and obesity

**Overweight increases the risk of becoming ill.** People with a high body weight are more likely to develop various illnesses. For example, overweight people run a greater risk of cardiac infarction, all the more so if the person in question is physically inactive, smokes and/or suffers from high blood pressure. It has also been confirmed that being even slightly overweight can be a predisposing factor in type 2 diabetes. According to the Nurses' Health Study, very overweight women (BMI > 30) run a 30 times greater risk of developing diabetes than very slim women (BMI < 22) [120]. In addition, being overweight is connected to lipometabolism disorders, gout, back complaints, gallbladder diseases, strokes and certain types of cancer [121].

Overweight and obesity can heighten the risk of disease among adolescents, too. For example, they can increase the likelihood of developing high blood pressure, diabetes or diseases of the joints; and weight problems are liable to continue into adulthood [121]. Reliable statements as to the frequency of overweight and obesity among children in Germany are expected following the completion of the nationwide German Health Interview and Examination Survey for Children and Adolescents currently being conducted by the Robert Koch Institute.

**Only a third of men and half the women in Germany have normal weight.** Overweight and obesity are widespread. This was shown by the results of the 1998 National Health Interview and Examination Survey, the 2003 microcensus and the current data from the 2003 Telephone Health Survey [123, 124]. About half of men and a third of women aged 18 and over are overweight; 17 percent of men and 20 percent of women are obese. Based on this calculation, only a third of adult males and just under half of adult women can be said to be of normal weight.

Overweight and obesity increase with age. Four out of five men and women aged 60 and over in Germany are overweight or obese (see Figure 2.6.1).

There is little difference between men from western and eastern Germany as regards the prevalence of overweight and obesity. By contrast, there is a clear east-west variation among women over 30. In the population aged 65 and over, 48.8 percent of east German women are obese, as opposed to 28.3 percent of west German women in the same age group.

By European standards the proportion of people who are overweight or obese is markedly higher in Germany and the UK than in other EU countries [125]. It is worth noting, however, that the results in both countries were based on objectively measured heights and weights, whereas the data in the other countries were based on self-estimated heights and weights. If

### Definition

Overweight is defined as a body weight that is increased relative to the norm in the form of a higher proportion of body fat. Overweight is not an illness per se but a risk factor in the development of various illnesses. The term "overweight" is often used professionally meaning minor surplus body weight. On the other hand, obesity is understood as a pronounced form of overweight. It is commonly divided into three degrees of severity: grades I – III.

The distribution of fat also influences the potential secondary and concomitant diseases of an overweight condition. This distribution is primarily genetically determined. Most overweight men, for example, have a surplus of fatty tissue on their stomach and torso ("apple-type"), which is classified as android distribution. Surplus fatty tissue in women is more often on the hips and thighs ("pear-type"), and is known as the gynoid type. Various studies have stressed the increased health risk associated with android distribution, for instance that of cardiovascular disease [121].

### Definition

Body mass index (BMI) is an indicator commonly used for determining whether a person is underweight, of normal weight or overweight. There is a close correlation between BMI and total body fat tissue and it is easy to measure. BMI is defined as body weight in kilograms divided by the square of height in meters.

$$\text{BMI} = \frac{\text{weight (kg)}}{\text{height (m)}^2}$$

If the body weight is 80 kilograms and the height is 1.80 meters, then the BMI is 24.7.

According to a classification of the World Health Organization, underweight is classified as BMI < 18.5, normal weight as 18.5–24.9, overweight as 25.0–29.9, and obesity grades as follows: grade I = 30.0–34.9, grade II = 35.0–39.9, grade III ≥ 40 [122]. The standards are the same for men and women.

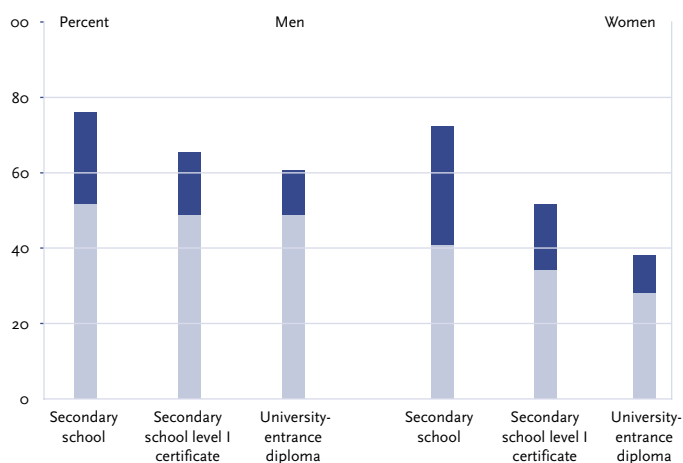


Figure 2.6.2: Prevalence of overweight and adiposity, by school education and sex. Source: Telephone Health Survey 2003 [124]

	Period of observation					
	1984–86	1987/88	1990–92	1998	2003	Variation 1984–2003
<b>Men</b>						
BMI 25 to <30	50.1	50.1	49.3	49.8	52.9	+2.8
BMI ≥30	16.2	15.0	18.0	21.5	22.5	+6.3
<b>Women</b>						
BMI 25 to <30	32.0	32.1	32.1	31.5	35.6	+3.6
BMI ≥30	16.2	17.5	21.2	22.4	23.3	+7.1

Table 2.6.1: Extent of overweight and adipositas from 1984 to 2003 (as a percent). Source: Nationwide Health Survey of the RKI 1984–86 to 1998 and Bertelsmann Health Monitor 2003 [21]

Blood Pressure Classification	Women			Men		
	Total	Old Federal States (Western Germany)	New Federal States (Eastern Germany)	Total	Old Federal States (Western Germany)	New Federal States (Eastern Germany)
Normal	57.9%	59.1%	53.3%	49.7%	51.5%	42.6%
Borderline	9.3%	9.3%	9.1%	15.8%	15.5%	16.8%
Hypertension	26.9%	26.1%	30.1%	29.7%	28.5%	34.5%
Controlled hypertension	5.9%	5.5%	7.5%	4.8%	4.5%	6.1%

normal: Systole < 140 mm Hg and Diastole < 90 mm Hg; borderline: bordering on hypertension: Systole ≥ 140 bis ≥ 149 mm Hg and/or Diastole ≥ 90 bis ≥ 94 mm Hg; hypertension: Systole > 149 mm Hg and/or Diastole > 94 mm Hg; controlled hypertension: Anti-hypertensive medication Systole ≥ 149 mm Hg and Diastole ≥ 94 mm Hg.

Table 2.6.2: Hypertension prevalence according to the WHO classification, 1998 (in percent), modified. Source: National Health Interview and Examination Survey 1998, RKI

Country	Prevalence Rate			Anti-hypertensive therapy
	Total	Women	Men	
North America	27.6%	24.8%	30.4%	44.4%
USA	27.8%	25.8%	29.8%	52.2%
Canada	27.4%	23.8%	31.0%	36.3%
Europe	44.2%	38.6%	49.7%	26.8%
Italy	37.7%	30.6%	44.8%	32.0%
Sweden	38.4%	32.0%	44.8%	26.2%
England	41.7%	36.5%	46.9%	24.8%
Spain	46.8%	44.6%	49.0%	26.8%
Finland	48.7%	41.6%	55.7%	25.0%
Germany	55.3%	50.3%	60.2%	26.0%

Hypertension: ≥ 140/90 mm Hg or anti-hypertensive therapy

Table 2.6.3: International comparison: occurrence rate of hypertension and anti-hypertension therapy among men and women aged 35–64, age adjusted. Source: [130]

data from subjective surveys carried out in the population were included, there would be no substantial difference between Germany and most of the other countries in Europe [126].

**The socially disadvantaged are more often overweight.** In Germany, as in many other countries, overweight and obesity are more frequent in socially disadvantaged population groups. Usually the socio-economic status in empirical studies is defined on the basis of household income, professional status and level of education. The data from the 2003 Telephone Health Survey show that overweight and obesity occur significantly more frequently among men and women with a lower secondary-school leaving qualification than among those with the higher education entrance qualification (the German "Abitur") (see Figure 2.6.2). The educational factor plays a slightly more important role for women than it does for men.

**The number of overweight adults has risen since the 1980s.** The prevalence of overweight and especially obesity has risen in Germany over the last two decades, at least according to data from the health surveys that have been conducted since the mid-1980s and the 2003 Bertelsmann Health Policy Monitor (see Table 2.6.1). These show that the percentage of overweight men (BMI 25 to <30) rose by 2.8 to a total of 52.9 percent; the percentage of obese (BMI >30) men rose by 6.3 to a total of 22.5 percent. The percentage of overweight women rose by 3.6 to 35.6 percent and that of obese women by 7.1 percent to a total of 23.3 percent [21].

This trend, which can be observed in all OECD member states, underlines the need for policy action on this aspect of health. Intervention to prevent or reduce overweight and obesity is necessary at many levels. A permanent change in eating habits is almost always essential. An optimum diet is rich in variety and contains a high proportion of fruit, vegetables and cereal products, while fat, salt and sugar should be taken sparingly [127].

A low-calorie diet is only recommended when the need to lose weight is a matter of urgency, for example before an operation. Along with a change in eating habits, increased physical activity and the resultant energy consumption play a key role. Endurance sports – such as power walking, endurance running, cycling and swimming – are especially suitable. Even an increase in physical activity in everyday life, for example by using stairs more often or walking, often has a positive effect.

In severe cases of overweight, medical measures can be viable or in some cases necessary. Along with behavioural therapies and prescribed medication, surgical treatment is indicated in extreme cases of obesity.

In all events, priority needs to be given to the prevention of overweight and obesity, a process that must begin at an early age, in childhood or adolescence, since healthy nutritional habits and a physically active lifestyle have to be learned [121].

► Comprehensive Information on **overweight and obesity** can be found in booklet 16 of the Federal Health Reporting's series [121].

## 2.6.2 High blood pressure

**About a third of adults in Germany evidently have high blood pressure.** High blood pressure (hypertension) fosters cardiovascular complaints by exerting a linear effect on cardiovascular risk. Hypertension is diagnosed according to certain blood-pressure values. Blood pressure is measured in millimetres of mercury, an old unit of pressure. According to the definition most commonly in use, hypertension is said to exist when the systolic (upper) blood-pressure value has a reading of  $\geq 140$  mm Hg and/or the diastolic (lower) value a reading of  $\geq 90$  mm Hg [128].

According to data from the 1998 National Health Interview and Examination Survey (BGS98), the percentage of men and women between the ages of 18 and 79 with hypertension ( $\geq 140/90$  mm Hg) is 50.3 percent and 42.1 percent respectively [129]. About two-thirds of the cases were of definite hypertension, with readings of a systolic value of more than 149 mm Hg or a diastolic value of more than 94 mm Hg (see Table 2.6.2).

The higher incidence of high blood pressure among men can be seen in both western and eastern Germany. The prevalence of (definite) hypertension is especially high in eastern Germany.

**Therapy only works properly for some patients.** 26 percent of people with hypertension ( $\geq 140/90$  mm Hg) between the ages of 35 and 64 are treated with medication [130].

The 2001 HYDRA study (Hypertension and Diabetes Screening and Awareness) showed that controlled hypertension ( $< 140/90$  mm Hg, i.e. when existing blood pressure is brought down to normal or near-normal levels by medication) was achieved in less than 30 percent of patients treated for high blood pressure [131]. On the whole, women were treated more often than men and more often successfully, although they suffer from high blood pressure less often than men. Furthermore, there is room for improvement in the detection of hypertension by general practitioners. High blood pressure often goes undetected, especially in young men.

Since the early 1990s the prevalence of definite hypertension has increased among women by 3.9 percent to a total of 27 percent and in men by 1.7 percent to a total of 30.1 percent (data source: East-West Health Examination Survey 1990/2). At the same time, the prevalence rates of high blood pressure in western and eastern Germany have converged. In western Germany high blood pressure among both men and women increased in the 1990s, while rates for men in east Germany declined over the same period [129].

**High blood pressure is more frequent in Germany than in many other countries.** High blood pressure is more prevalent in Germany than in most other industrialized countries (see Table 2.6.3 [130]). Only half as many people suffer from high blood pressure in the USA and in Canada as here in Germany, and a higher proportion of sufferers there undergo treatment.

Gender/ Age (years)	Total cholesterol level (mg/100 ml)					
	≥ 200		≥ 250		≥ 300	
Women						
18–19	26.4		5.4			
20–29	53.4	0.3*	12.0		0.7	
30–39	61.5	0.1*	15.2	0.1*	3.4	
40–49	74.0	0.9*	26.0	0.5*	4.5	
50–59	89.9	3.3*	50.9	2.3*	13.3	1.0*
60–69	94.2	11.5*	64.4	7.0*	21.4	2.6*
70–79	90.9	9.6*	56.5	5.8*	17.6	3.3*
Total	74.9	3.7*	34.9	2.3*	9.2	1.0*
Men						
18–19	16.0		0.8			
20–29	41.5		9.3		1.7	
30–39	70.1	1.4*	25.1	1.0*	5.2	0.3*
40–49	83.7	2.7*	40.9	1.7*	11.5	0.6*
50–59	85.7	5.8*	43.0	2.7*	9.8	0.6*
60–69	86.9	9.3*	44.3	4.5*	12.8	0.9*
70–79	80.8	8.1*	44.6	3.4*	14.8	1.4*
Total	72.6	3.8*	32.2	1.9*	8.3	0.5*

\* Proportion of persons (as a percentage), treated with anti-cholesterol medication

**Table 2.6.4:** Frequency of raised cholesterol levels among men and women by age (as a percent). Source: National Health Interview and Examination Survey 1998, RKI

### 2.6.3 Hypercholesterolemia

**The cholesterol levels of a third of adults are too high.** Informative and accurate data on cholesterol levels among Germans was provided at the beginning of the 1990s by the 1990/91 National Health Interview and Examination Survey and the Health Survey East 1991/92 [132]. According to these data, 74 percent of the 25- to 69-year-olds have a total cholesterol level of  $\geq 200$  mg/100 ml. Values of 250 mg/100 ml and above (hypercholesterolemia) were found in 35.6 percent of women and 31.4 percent of men, while values of 300 mg/100 ml and over were found in 10.5 percent of women and 7.4 percent of men.

The results for both sexes showed that the total cholesterol value rises with age. The data do not provide a more differentiated approach with regard to illnesses or medical treatment, although it seems that fewer than five percent of the participants in the surveys had taken cholesterol-lowering medication [134].

Fresh data came from the 1998 National Health Interview and Examination Survey (see Table 2.6.4) [135]: 15.2 percent of women and 25.1 percent of men in the 30–39 age group had a cholesterol value of  $\geq 250$  mg/100 ml. Hypercholesterolemia ( $\geq 250$  mg/100 ml and  $\geq 300$  mg/100 ml) occurs most frequently among women aged between 60 and 69. It becomes increasingly frequent among men up to the age of 80.

The cholesterol value is regarded as unfavourable when the total cholesterol value exceeds 250 mg/100 ml, while at the same time the ratio of total cholesterol to HDL cholesterol is more than 5:1. Such a combination can be found in 10.7 percent of women and 20.9 percent of men on average. It generally occurs earlier in men's lives and affects an average of 28.1 percent of 40- to 49-year-olds. The percentage of 50- to 79-year-old women with this constellation of risk factors varies between 17.4 and 21.4 percent.

What is really dangerous is the combination of several different risk factors. Hypercholesterolemia is more likely to involve a cardiovascular risk if accompanied by smoking, high blood pressure, diabetes or a genetic predisposition. In certain cases when various risk factors combine at the same time, the patient

is said to have “metabolic syndrome”. According to various prospective studies the risk that a person with metabolic syndrome will develop – and even die from – cardiovascular disease is 2 to 4 times greater [138–140] than someone without. The prevalence of metabolic syndrome in the USA among the general adult population is estimated at over 20 percent. There are several reasons why the syndrome develops, but overweight, insufficient physical activity, a detrimental diet and eating habits, and genetic factors, which have not all been clearly identified, certainly contribute to the danger [139, 141]. The early detection, therapy and prevention of metabolic syndrome currently constitute one of the greatest challenges facing the healthcare system.

#### Definition

Hypercholesterolemia refers to a clearly elevated level of cholesterol in the blood. The cholesterol level is frequently recorded in milligrams (mg) of cholesterol per 100 millilitres (ml) of blood serum. Excessive values are an indication of a lipometabolism disorder and play a leading role in cardiovascular disease. Drawing from the recommendations of the European Arteriosclerosis Society (EAS) of 1986, high cholesterol values can be classified in three groups (200–<250 mg/100 ml; 250–<300 mg/100 ml;  $\geq 300$  mg/100 ml). As a rule, hypercholesterolemia is said to apply when there is a value of 250 mg/100 ml or over [132].

Cholesterol is transported in the blood by linking up to special proteins known under the abbreviations LDL and HDL, which are responsible for different cholesterol transport routes in the organism. In the case of a hardening of the arteries, LDL cholesterol and HDL cholesterol possess contrary tendencies (damaging and protective): the first is popularly known as “bad cholesterol” and the second as “good cholesterol”. Following the current European guidelines on cardiovascular diseases drawn up by the European Society of Cardiology in 2003, the total cholesterol level should be under 190 mg/100 ml and the LDL cholesterol level under 115 mg/100 ml [133]. What is also important is the ratio of the total cholesterol level to the HDL cholesterol level. A ratio higher than 5:1 is considered unfavourable.

#### Definition

Metabolic syndrome is characterized by a combination of overweight, high blood pressure, lipometabolism disorders and insulin resistance. The latter is marked by low insulin efficiency in the organism and plays a significant role in the development of type 2 diabetes. The various risk factors interact, leading to a greatly increased risk of cardiovascular diseases [136, 137].

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**Key statements**

- ▶ Book V of the German Social Security Code stipulates that disease prevention and health promotion are among the obligations of statutory compulsory health insurance funds (gesetzliche Krankenkassen) (page 127)
- ▶ Physical exercise, nutrition and stress are the most common themes of prevention courses run by compulsory health insurance funds. Four-fifths of the course participants are women (page 131)
- ▶ Around 20 million people in Germany are vaccinated against influenza every year (page 133)
- ▶ About half of all women and a fifth of men undergo cancer screening (page 133)
- ▶ In western Germany about 40 percent of those entitled to do so use prophylactic dental treatment (page 135)
- ▶ Over 90 percent of children undergo the standard preventive examinations in the first two years of their life (page 136)
- ▶ Men are less well informed about health-related matters than women (page 139)
- ▶ The demand for available disease-prevention programmes is less pronounced among the socially disadvantaged (page 141)

### 3 What forms of prevention and health promotion are provided by the healthcare system?

► *Abstract*

According to the German government's November 2005 coalition agreement, disease prevention and health promotion are to become an autonomous pillar of the health service, including a law on prevention. The aim is to prevent disease, increase the population's life expectancy and improve its quality of life. The range of preventive measures laid down in Book V of the German Social Security Code and financed by the statutory health insurers include vaccinations, health check-ups, cancer screening, preventive dental care, health promotion at the workplace, and making primary prevention availability to insured people.

Since the 1990s more and more people in Germany have been taking advantage of the preventive-care measures on offer, with rising participation rates in protective and influenza vaccinations, check-ups and cancer screening. The number of people undergoing individual preventive dental care has also risen considerably since it was added to the schedule of statutory health insurance (SHI) benefits in 1991.

That said, these services are still only reaching a fraction of the population. In general, men are less interested in prevention and health promotion than women. Men tend to agree to preventive

healthcare measures only if they do not involve additional effort on their part, for example when the measures can take place where they work or are included in a visit to the doctor that was already planned.

Furthermore, the demand for disease-prevention programmes is less pronounced among the socially disadvantaged than among people from higher social strata, a fact that could have something to do with social barriers to access or a lack of information. Structural improvements in the health system are needed, along with a greater awareness of health matters among the population at large. The numerous prevention schemes on offer must reach all social strata of the population and be better coordinated and interconnected by the organizers. There are also deficits in prevention research. For instance, the effectiveness or economic benefits of certain prevention measures need to be clarified in detail.

This chapter focuses on the opportunities of disease prevention that are regulated by Book V of the German Social Security Code – Statutory Health Insurance – (SGB V). Preventive services are also provided by the national pension scheme and accident insurance companies.

### 3.1 The range of available preventive-care strategies

► *Abstract*

Prevention and health promotion can avert disease and at the same time improve the population's quality of life. The idea of disease prevention has a long tradition. Until the end of the 1970s, paternalistic concepts of prevention predominated in both the former GDR (East Germany) and the Federal Republic (West Germany). Such concepts consisted mainly of measures of social hygiene, such as mass vaccinations and mass screening in schools, and providing the population with health education. Since the 1980s, however, growing attention has been paid to the influence of social circumstances on health, leading, for example, to the subsequent emphasis on promoting health at the workplace.

Section 20 (subsections 1 and 2) of Book V of the German Social Security Code (SGB V), obliges the statutory health insurers to earmark a specific percentage of their expenditure to measures of primary disease prevention and health promotion: e.g. prevention courses, schemes to promote health at work, and support for self-help groups pursuant to section 20 subsection 4 of the SGB V.

The public remains insufficiently informed about the many available prevention schemes; furthermore, these schemes are not sufficiently interconnected. There are also deficits in prevention research. For instance, the effectiveness or economic benefits of certain prevention measures need to be clarified in detail.

### 3.1.1 The aim and significance of prevention and health promotion

**The purpose of disease prevention is to improve the population's quality of life.** The aim of prevention and health promotion is to avert diseases and their consequences, improve people's quality of life and sense of well-being, and extend healthy life expectancy. Moreover, preventive and health-promoting measures can help reduce socially determined disadvantages in the field of health by including and indeed targeting socially disadvantaged groups [1, 2].

In health policy, greater priority has been given to developing concepts for providing preventive care since 2000. Factors contributing to this change of approach include the demographic shift – accompanied by a growing number of people who are chronically ill and in need of care – and a lack of financial resources throughout the health system. At the same time, recent findings of public health research show that both social circumstances and individual behavioural patterns have a decisive influence on individual health levels.

The concept of salutogenesis plays a highly significant role here [3, 4]. As a counter-model to pathogenesis (the origin and development of disease), the theory of salutogenesis describes why people stay healthy – and what qualities and abilities will help them do so. The salutogenesis model dispenses with a strict division between disease and health as two opposing conditions. Rather, health is understood as a process in an overall

#### Definition [6]

Health promotion (or increasing health-related resources) is defined as measures aimed at discouraging behaviour that is detrimental to good health, promoting people's ability to make informed decisions about their health, and improving living conditions that are relevant to health. This includes, for example, the protection of non-smokers and making sure that people are properly educated or informed about healthy nutritional habits. Health promotion is regarded as an important and relevant part of every aspect of a modern healthcare system [7]. By contrast, prevention is defined as deliberate protection against certain diseases and their consequences.

Primary prevention (prophylaxis, protection against risk) covers measures designed to prevent or delay the first appearance of a disease. Primary prevention focuses on people who are (still) healthy. It concentrates on risk factors or co-factors of diseases; it may relate to the behaviour of individuals or groups (behaviour prevention) or to the biological, technical or social environment (condition prevention). Primary prevention includes measures which serve to provide protection from risk, such as vaccinations or Vitamin D prophylaxis. Secondary prevention (screening) serves to detect and provide therapy as early as possible for a disease that is already present. The intention is to halt the progress of the disease in its initial stages. One example of this is cancer screening. Tertiary prevention (rehabilitation) is aimed at preventing the onset of functional disorders and secondary illnesses which might otherwise be expected to result from a disease, and to restore the patient to the highest quality of life possible. An example is participation in a special sports group after a heart attack.

Interventions in the field of prevention and health promotion can take place at various levels. The "individual approach" is primarily geared to specific people and their behaviour. An example is specific opportunities for counselling. The "setting approach" covers measures in all areas of human life where people usually spend a major part of their time: e.g. at work, at school or at home. This form of health promotion is generally regarded as very promising. Interventions at the level of the population means activities related to the entire population of a specific group. They can include laws, regulations and information campaigns (e.g. anti-smoking campaigns) [8].

health-disease continuum, influenced by social, physical, emotional and mental factors. Salutogenesis first entered the international debate on health policy with the Ottawa Charter [5].

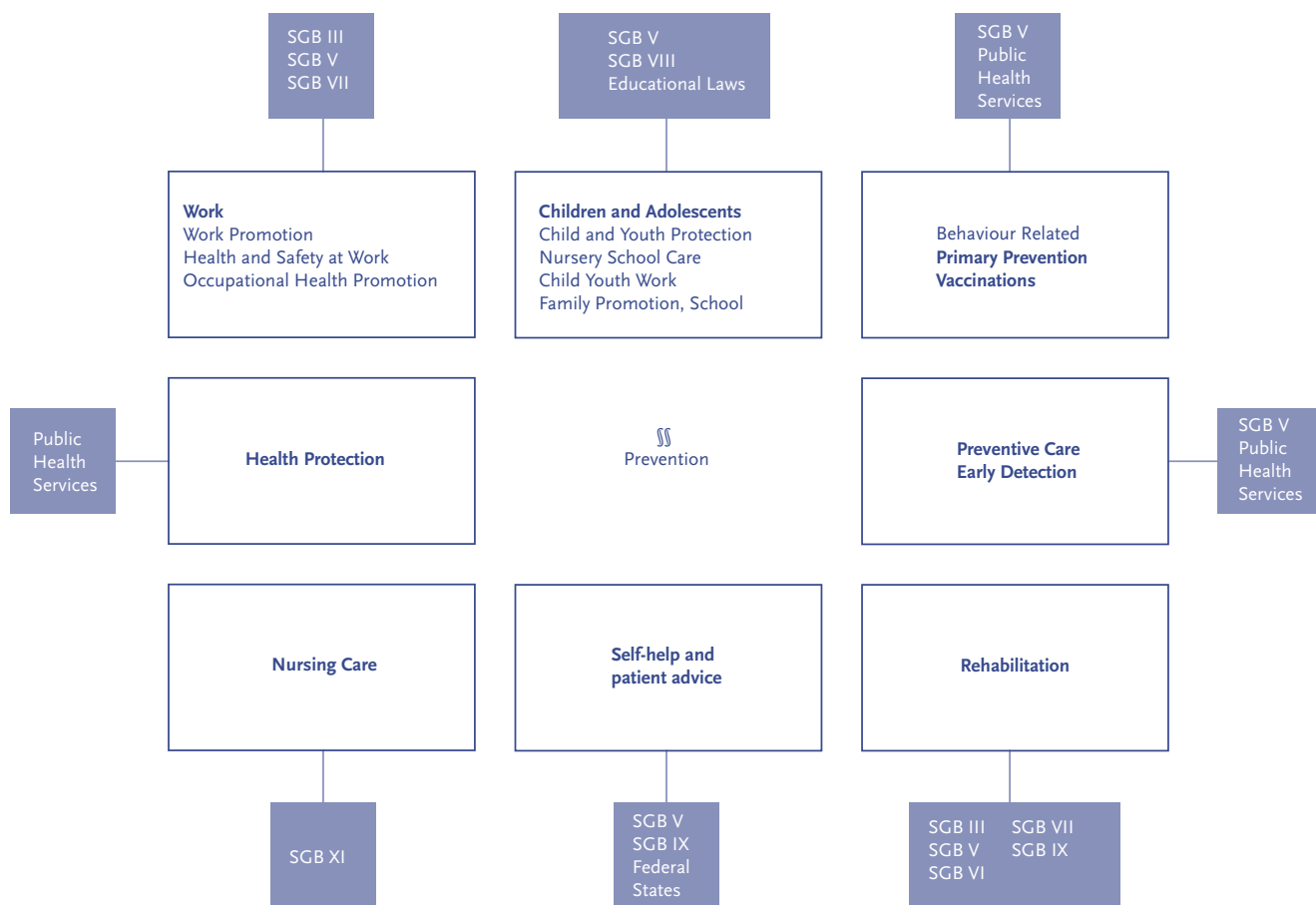
**Prevention can reduce treatment costs.** Specifically, prevention aims at a whole range of effects: it can prevent diseases and reduce the risk of disease; avert premature mortality; help save money on health-treatment costs; ensure that treatment is given at the right time; avert disabilities; maintain a person's ability to work; prevent or delay early retirement; postpone the onset of chronic diseases to a more advanced age or indeed preclude them completely; raise the quality of life; and improve the population's general state of health [9].

The extent to which prevention serves to save costs in the health system is a matter of controversy. On the one hand, preventive measures reduce the direct costs of healthcare treatment; prevention also saves money indirectly by reducing the costs that arise in the wake of ill-health, such as inability to work or early retirement. On the other hand, prevention measures themselves cost money, and delaying the onset of ill-health to later years will arguably lead to a rise in therapy costs in the future [9].

### 3.1.2 The historical development of the prevention approach in the German healthcare system

**Paternalistic concepts of prevention were predominant until the late 1970s.** In the former West Germany the government set up the «Federal Committee of National Health Instruction» (now known as the Federal Association of Health) in 1954 and the Federal Centre for Health Education in 1967 – primarily to promote the health education of the individual (behaviour prevention). This was in sharp contrast to the health policy of the then GDR, which was based on centralist state control, stressing the state's responsibility for general prophylaxis [10]. In the former GDR health promotion and healthcare were regarded as a general socio-political responsibility, leading for example to mass vaccinations and mass medical examinations in schools and places of work. This social-hygienic approach in the healthcare system was reflected in the founding of various institutions [11], for instance the Institute for Health Education at the German Hygiene Museum in Dresden in 1967. A paternalistic attitude to health education which ignored social influences on a person's state of health was predominant in both parts of Germany up to the late 1970s [12].

**The notion that social circumstances are important to health came to the fore in the 1980s.** From the early 1980s on, more attention was paid to the social factors that determine health and illness, both among scientists and in health policy. Condition prevention (i.e. the promotion of conditions conducive to better health) gained in importance as a result. The so-called Ottawa Charter of the World Health Organization strengthened the notion of condition prevention at the international level. The German Cardiovascular Prevention Study (DHP) was the first comprehensive German municipality-based research project on cardiological prevention [13]. There was also a lot of research on health promotion at the workplace [7, 14–19], as well as various projects funded by compulsory health insurance funds, e.g. the BKK (company health insurance) study entitled «Illness and Work-related Stress» [20]. In 1989 prevention and health promotion were enshrined in law with the addition of section 20 to Book V of the German Social Security Code (SGB V).



**Figure 3.1:** The major health-related areas with preventive legal regulations in the German Social Security Code and at federal state level. Source: [22, 23]



These changes included making the statutory compulsory health insurance funds responsible for a blanket prevention programme. Although this statutory responsibility was subsequently revoked in 1996 with its removal from Book V of the German Social Security Code (section 20 of the SGB V), responsibility for workplace health promotion remained unchanged. This interrupted the further development of primary prevention in the German health system. However, the revision of section 20 of the SGB V in 2000 gave the compulsory health insurance funds greater scope to act in the fields of primary prevention and workplace health promotion.

### 3.1.3 The German healthcare system's current approach to prevention

**Neither providers nor beneficiaries are properly informed about prevention possibilities.** The German Forum for Disease Prevention and Health Promotion (DFPG), which brings together 70 key players in the healthcare sector, was founded in 2002 on the initiative of the German Health Minister to stress the importance of disease prevention as the responsibility of society as a whole. They work on the development and implementation of far-reaching, holistic prevention concepts – and on bringing together the various prevention activities and strategies taking place at the national, state and municipal level ([www.forumpraevention.de](http://www.forumpraevention.de)). A «Health Goals» initiative has formulated primary targets in two areas: «Reducing Tobacco Consumption» and «Growing Up Healthy: Nutrition, Physical Exercise, Coping with Stress» ([www.gesundheitsziele.de](http://www.gesundheitsziele.de)).

Even so, the resources currently available in Germany are insufficient to introduce the full, potential range of preventive measures. The continuing lack of transparency, networking and coordination means that there have been no synergies in prevention, despite a large number of positive initiatives and the involvement of many committed people. Neither the organizations offering prevention and health-promotion programmes in Germany nor the potential users of such programmes are properly informed about prevention, health promotion, self-help, rehabilitation and health protection as laid down in many laws and regulations [21].

Procedures on prevention are to be found in the many laws and implementation regulations of the German Social Security Code (SGB, see Figure 3.1). Health protection, primary protection, prophylaxis, early detection and tertiary prevention, as well as health promotion at the workplace, in school and in municipalities, are regulated in Germany in numerous laws at both federal and state level [22, 23].

There are also relevant regulations in laws on the environment, transport, agriculture, food protection and consumer protection – and well as laws on public health at the state level (ÖGD).

There are many state-run institutions, public-service corporations and private welfare agencies working in the field of prevention and health promotion at the central, state and municipal level. At the municipal level, for example, these include the public health service, doctors' surgeries, the branch offices of compulsory health insurance funds and self-help centres, as well as schools and private players such as companies. The regional health associations, consumer-protection centres and state health laboratories are active at the state level. At the federal level, the ministries and authorities concerned with health education, food safety, risk assessment and the prevention of

infections play a leading role. More transparency is needed here, too, in addition to better networking between the various activities [22].

#### 3.1.3.1 The responsibilities of the statutory health insurers in the fields of prevention and health promotion

**The compulsory health insurance funds in Germany are responsible for prevention and health promotion.** The fundamental responsibility of German compulsory health insurance funds for disease prevention and health promotion is enshrined in section 1 («Solidarity and Self-Responsibility») of Book V of the German Social Security Code (SGB V) in the following words: «On the basis of the principle of shared risk, the task of health insurance is to maintain, restore or improve the health of the people insured.» Measures named in this context include providing not only health education and advice, but also services.

Examples of preventive-care services include vaccinations, prenatal care, medical examinations of children and screening (sections 23, 25, 26 of the SGB V, sections 195, 196 of the RVO). This range of services has been modified and extended many times over the last decades. There are also other regulations that make it possible to finance preventive-care measures. These include the promotion of primary disease prevention, including workplace health promotion pursuant to section 20 subsections 1 and 2 of the SGB V, preventive dental care (sections 21, 22), support for self-help groups and organizations (section 20 subsection 4), courses for patients (section 43 no. 2), the promotion of patient counselling (section 65 b), and bonus schemes for behaviour reflecting active health awareness (section 65 a subsection 1).

**Compulsory health insurance funds are obliged to spend a certain amount on prevention.** Section 20 of the SGB V places special emphasis on health promotion and disease prevention. It lays down the direction to be taken by compulsory health insurance funds in prevention and health promotion. First, health insurers are to provide a primary-prevention service aimed at helping to minimize socially created inequalities in health. Second, health insurers can supplement health and safety standards at work with health-promotion measures of their own. A variable annual sum per member (€2.70 in 2004) is to be invested in prevention and workplace health promotion. Third, health insurers are to support self-help groups, organizations and advice centres.

The National Confederation of Compulsory Health Insurance Funds has laid down common, uniform areas of responsibility and criteria for fulfilling their legal obligations in preventive care. These focus on two areas: the «individual approach» – i.e. concentrating on specific people and their health-related behaviour – and the «setting approach», which covers preventive-care and health-promotion measures in given social environments, such as nurseries and schools.

**Priority is given to the socially disadvantaged.** In particular, these health-related measures target people whose health prospects are poor owing to social circumstances. Various gender-specific needs are also to be taken into account. A working group formed by the National Confederation of Compulsory Health Insurance Funds [24] lays down common and uniform action priorities and performance criteria. The compulsory health insurance funds are backed up in their work by an advisory commission with representatives of the Advisory Council on the Assessment of Developments in the Healthcare System, the Federal Centre for Health Education, the Federal Association of Health, the Federal Institute for Occupational Safety and

Health, and the Federation of Institutions for Statutory Accident Insurance and Prevention.

Self-help groups constitute an important part of health promotion. By providing recognition and help they strengthen the participants' individual resources [25]. The legal requirement that statutory health insurance must promote self-help was laid down in section 20 of the SGB V early in 2000. At the same time, «Common and Uniform Guidelines of the National Confederation of Compulsory Health Insurance Funds for the Promotion of Self-Help» (March 2000) were drawn up. Since then, self-help groups and advice centres have been receiving financial support from the compulsory health insurance funds. The amount involved is subject to annual review and is either a flat rate or linked to a specific project. The cost in 2004 was 54 euro cents per insured person.

In order to be able to properly appraise the diverse approaches to prevention and health promotion, there are growing demands in both scientific and political circles for research into the quality of the implemented measures and quality-assurance procedures. Appraising and reviewing the performance of each approach is an essential requirement of process optimization and quality management (see also chapter 4). The statutory compulsory health insurance funds meet this requirement with regard to preventive and health-promotion measures (as required by section 20 of the SGB V) with an annual documentary report submitted by the Medical Review Board of the National Confederation of Compulsory Health Insurance Funds. Furthermore, surveys of course participants are conducted, and company health-promotion measures are backed by research projects.

### 3.1.3.2 Prevention in the doctor's surgery and by medical services

**Doctors need to act preventively.** Doctors' preventive responsibilities include not only such prophylactic measures as inoculations and screening, but also counselling individual patients on healthy ways of living. At the moment early-detection measures (secondary prevention) include cancer screening, regular examinations of children, health check-ups for adolescents and medical examinations of adults (e.g. for cardiovascular complaints, kidney diseases, diabetes mellitus, etc.). Prenatal care as part of maternity benefit entitlement has been part and parcel of medical prevention in Germany for decades.

**There is room for improvement in rehabilitation and nursing care.** Tertiary prevention, i.e. protection from the results of disease and the onset of functional disorders, is the classic task of rehabilitation care. This area has been developing in recent years with a greater orientation towards quality. However, the slow pace of expansion in outpatient rehabilitation and the financial pressure on the providers of rehabilitation services remain problematic issues [22].

The chronically sick should be more actively encouraged – through patient education and participation in disease-management programmes – to implement preventive-care measures themselves. Prevention can help avert the need for nursing care and, in the case of those already in nursing care, promote self-reliance and stop the further loss of functional abilities.

### 3.1.3.3 Health-oriented research

**Disease prevention and health promotion need to be conducted on a scientific basis.** To date it has not been possible to provide evidence on the effectiveness of many of the preventive measures in operation. It is the role of prevention research to find ways of placing prevention and health promotion on a sounder scientific footing (providing evidence of the effectiveness and benefits of programmes, e.g. by controlled comparisons). Such research projects require the networking of relevant people in the fields of science, active health promotion and politics, and greater recognition of this branch of research in society. In its latest enquiry, the «Health and Work» initiative has presented its first results on health promotion: «The Health-Related and Economic Benefits of Workplace Health Promotion and Prevention» [26]. Health surveys in the population, like the ones carried out by the Robert Koch Institute, can be used to examine the links between an individual's personal circumstances and his/her state of health, and between a person's subjective assessment of his/her well-being and the degree to which he/she makes use of prevention measures. Studies in which the same group of people is observed over a long-enough period of time (longitudinal or cohort studies) are a useful way to monitor the sustainability of promising approaches to prevention and health promotion.

### 3.2 Participation in prevention programmes

► *Abstract*

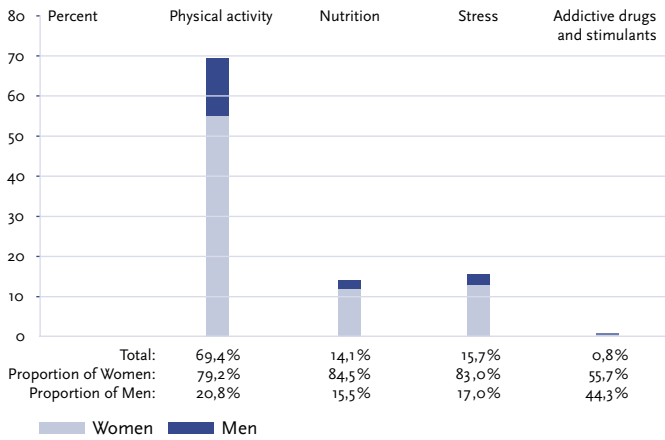
A growing number of people in Germany take part in prevention measures. Even so, the various programmes on offer are still only being taken up by a minority of the population.

The statutory health insurers are among those most actively involved in primary prevention (averting disease). Their work in this field includes courses on prevention for insured people and health-promotion measures in schools and at the workplace. Primarily, prevention courses focus on the health-related behaviour of individuals. The most common subjects are physical exercise, diet and coping with stress. Four-fifths of the approximately 800,000 course participants were women in 2004. Men and the socially disadvantaged are appreciably less inclined to take advantage of prevention programmes.

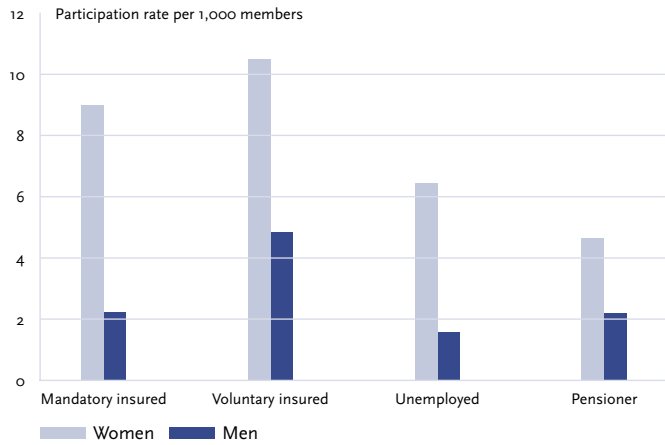
Workplace health-promotion measures, which focus on reducing physical strain at work, reached 670,000 people in 2004. In the same year, around 1.9 million people, largely children and adolescents, took part in health-promotion measures in non-workplace settings, such as schools, vocational colleges or kindergartens. Here attention was focused on physical exercise, stress reduction and relaxation.

Vaccinations, which are considered among the most effective of primary preventive measures, have increased in number considerably. The rates of child vaccinations and influenza shots increased during the 1990s, although the rates for measles vaccinations are still below the levels recommended by the World Health Organization.

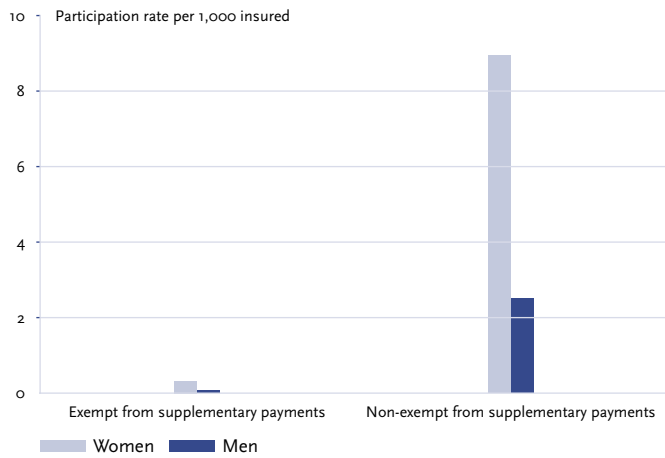
Similarly, forms of secondary prevention (early detection of disease) are still far from being exploited to their fullest possible extent, although they are being taken up by more and more people. For example, only 17 percent of those entitled to do so take advantage of the medical examinations financed by the compulsory health insurance funds, which are aimed at the early detection of cardiovascular and kidney disorders and diabetes. Just under half of women and a fifth of men take part in cancer screenings. By contrast, preventive examinations of children are widely accepted. More than 90 percent of children undergo the standard preventive examinations during the first two years of their lives.



**Figure 3.2.1:** Proportion of those availing themselves of primary preventive courses offered by the health insurance funds – Participation according to theme (in percent) in 2004. Source: MDK 2006



**Figure 3.2.2:** Participation in individual primary prevention courses as per § 20 SGB V by insured status and sex (2003). Source: Federal Association of Company Health Insurance Funds; N = 44 718



**Figure 3.2.3:** Participation in individual primary prevention courses as per § 20 SGB V by status regarding exemption from supplementary payments and sex (2003). Source: Federal Association of Company Health Insurance Funds; N = 55 698

### 3.2.1 Primary prevention

**Four fifths of participants in prevention courses are women.** Primary prevention measures (averting disease) are carried out by the compulsory health insurance funds, for example at the workplace or on an individual basis. Primary prevention in particular aims at promoting sufficient physical exercise and a healthy diet, overcoming stress or reducing the consumption of illegal drugs, alcohol and tobacco. The results of the various measures taken in this direction are documented annually by the compulsory health insurance funds [27].

More than 800,000 people, or 1.1 percent of people covered by statutory health insurance, took part in primary prevention courses in 2004. Four-fifths of them were women. Only in courses aimed at reducing the consumption of drugs, alcohol and tobacco was the male participation rate as high as 44 percent (see Figure 3.2.1).

**The socially disadvantaged do not attend preventive courses as often as others.** According to section 20 of Book V of the German Social Security Code, preventive-care measures should specifically target the socially disadvantaged groups of the population. However, according to studies conducted by the Federal Association of Company Health-Insurance Funds, which collects data from its funds on the members' age, gender and profession, the unemployed and pensioners are much less likely to take advantage of individual private prevention schemes than other insured people (see Figure 3.2.2).

The course-participation rate in 2003 was 1.6 per 1000 insured people among unemployed men and 6.5 among unemployed women. The rate among women in voluntary insurance schemes was 11 per 1000, and in statutory insurance schemes 9 per 1000.

Men were considerably less keen on participating in preventive-care courses than women. The participation rate was 4.9 participants per 1000 members among voluntarily insured men, an appreciably higher rate than among men in SHI schemes (2.2).

Exemption from patient contributions (for medicines, etc.) is an indication of a person's social circumstances. Data from the company health-insurance funds show that only a small proportion of members who have been exempted from co-payments («hard core») take part in primary healthcare prevention courses: fewer than 0.06 men per 1000 and 0.3 women per 1000 members (see Figure 3.2.3). This result also underlines the need to involve the socially disadvantaged more in disease prevention.

**Primary and other schools are popular venues for disease-prevention programmes.** In addition to prevention courses which are open to individual insured people, the compulsory health insurance funds offer primary preventive programmes in a range of settings. Outside the working environment, in 2004 such programmes were principally carried out in primary schools, vocational colleges and other academic environments,

kindergartens, nursery schools, specific city areas and families (see Figure 3.2.4).

In such settings one can expect to reach a relatively high proportion of people from underprivileged backgrounds. Furthermore, a broader range of people is reached with the help of multipliers such as teachers, educators and parents, and this can help ensure the sustainability of health promotion.

In 2004 over a million people, mostly children and adolescents, were directly informed about measures in non-occupational settings; a further 890,000 were informed indirectly, e.g. via health circles by people passing on information to them.

The main issues covered by preventive programmes in non-occupational settings in 2004 were diet and physical exercise (60 percent), followed by stress reduction, health awareness in interpersonal contact, consumption of drugs, alcohol and tobacco, a healthy environment, sex education and road safety. 50.6 percent of activities included interventions relating to both the personal situation (behaviour-related) and the respective environment (condition-related). 47.1 percent of programmes were exclusively behaviour-related, 1.4 percent exclusively condition-related.

**The focus of workplace prevention is the reduction of physical strain and stress.** According to the Luxembourg Declaration on Workplace Health Promotion, workplace health promotion in the EU encompasses all the efforts undertaken by employers, employees and society as a whole to improve people's health and well-being at the workplace. This can be done, for example, by optimizing work organization, creating more agreeable working conditions and promoting employees' involvement.

The compulsory health insurance funds and the statutory accident-insurance companies work together on ways to avert work-related health hazards. In 2000 the German Health Reform Act extended the discretionary powers of the compulsory health insurance funds by enabling them to complement industrial-safety measures with measures for promoting health at the workplace: e.g. avoiding work-related physical strain, ensuring a healthy company meal programme, coping with psychosocial stress and the consumption of drugs, alcohol and tobacco.

670,000 people took part in workplace health-promotion programmes in Germany in 2004. Over 40 percent of these were in the manufacturing field. In nearly 70 percent of the cases company health promotion focused on the need to reduce physical strain and stress (see Figure 3.2.5).

Up to a quarter of the workforce reached in most of the companies were women. Women made up over 75 percent of the workforce in less than 13 percent of the businesses in question. Just under half of the programmes were long-term initiatives lasting more than a year. Half of the interventions were a combination of behaviour- and condition-related activities; over a third focused on behavioural activities. Exclusively condition-related activities constituted just under twelve percent.

#### Available data

The amount of information available about the number of people making use of prevention programmes in Germany is limited. The data provided here relates to the preventive and health-promotion measures pursuant to Book V of the German Social Security Code. The information comes from the Central Research Institute of Outpatient Healthcare in Germany

(data on cancer screening and medical examinations), the Association of SHI-Accredited Physicians (data on group and individual dental prophylaxis) and the study group of the National Confederation of Compulsory Health Insurance Funds (data on measures taken by statutory compulsory health insurance funds under section 20 of the SGB V). These results are complemented by analyses based on the health

surveys conducted by the Robert Koch Institute, which also deal with the relation between people's social position and the extent to which they use prevention programmes. Figures on the number of people in the population who have been vaccinated can be derived from the statistics on school-entry health examinations, health survey data, and approval and sales statistics for vaccines.

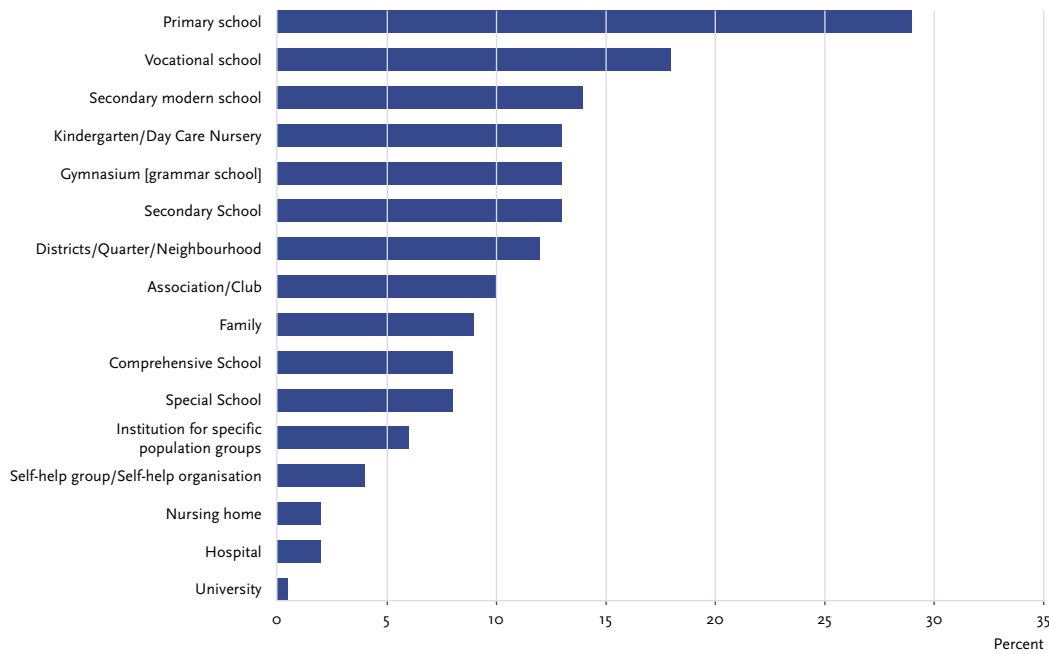


Figure 3.2.4: Non-occupation setting approach: Settings (Naming more than one possible). Source: MDK 2006 [27]

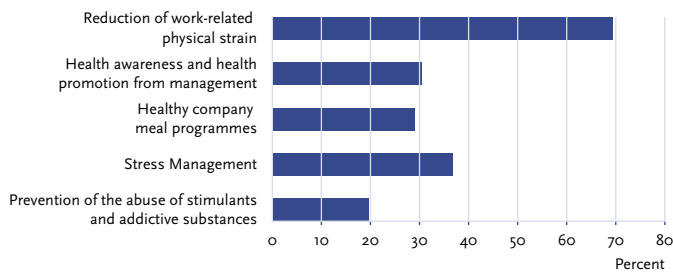


Figure 3.2.5: The content of occupational health-promoting activities. Source: MDK 2006 [27]

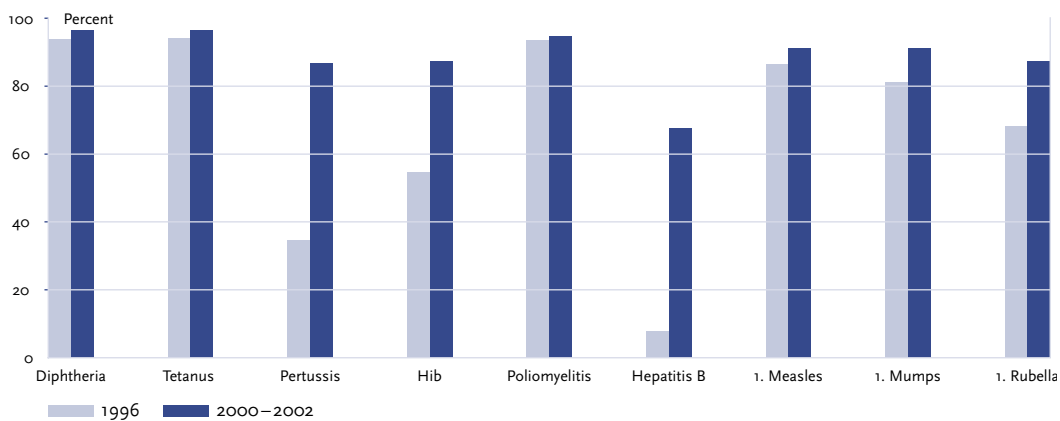


Figure 3.2.6: Vaccination rates at school entry health examinations in Germany (1996/2000 – 2002). Source: [28]

In 2004 about 3.4 million people out of a total of 70 million covered by statutory health insurance were reached by workplace-based and other prevention and health-promotion programmes.

**Germans are taking an increasingly positive attitude to vaccinations.** An increase in the rate of vaccinations exemplifies a greater acceptance of primary prevention. Data on school-entry health examinations in 1996 and 2000–2002 show that rates of vaccinations against diphtheria, tetanus and polio have risen and reached a satisfactory level. Acceptance in the population has also increased for the first measles, mumps and rubella vaccination. There has been a particularly sharp rise in inoculations against hepatitis B, *Haemophilus influenzae* type b (Hib disease) and whooping cough (pertussis). The increase can be attributed to the fact that inoculation has been recommended by the Permanent Vaccination Commission of the Robert Koch Institute and included in the schedule of services provided by the statutory health insurers.

Vaccinations against influenza, which are recommended by the Permanent Vaccination Commission for everyone over the age of 60, were carried out on 41.5 percent of men and 41.8 percent of women over 65 in the 2002/2003 influenza season [29]. According to information from the Influenza Working Group the number of vaccines used rose from about three million in the winter of 1992/3 to around 20 million in the 2003/2004 influenza season [30].

A higher proportion of people take part in vaccination programmes in eastern than in western Germany, as illustrated by the statistics for the second round of vaccination against measles, mumps and rubella. Whereas 57 percent of school beginners in eastern Germany were given the second anti-measles vaccination, the percentage in western Germany was just over 30 percent. Even the 57 percent figure is below the level recommended by the World Health Organization, which is 95 percent for the first vaccination and 80 percent for the second [32].

► Comprehensive Information on **vaccinations** can be found in booklet 1 of the Federal Health Reporting's series [28].

### 3.2.2 Secondary prevention (early detection of diseases)

**The participation rate in screening is rising.** The aim of secondary prevention is to ensure the earliest possible detection and treatment of diseases. Secondary prevention includes medical check-ups and screening. The aim is to reduce the incidence of disease, reduce mortality and improve the quality of life.

Between 1992 and 2004 the participation rate in medical examinations rose from 9.7 percent to 16.8 percent of those legally entitled to them [32]. 7.4 million medical examinations were carried out nationwide in 2004 [33].

Cancer screening rates reveal a similar pattern. The participation rate among women rose appreciably between 1991 and 1997, among men only very slightly. The procedure for recording participation rates was changed in 2000, making it impossible to compare rates for the periods 1991 and 1997 with those of 2000 and 2004.

In 2004, 46.8 percent of entitled women and 18.3 percent of entitled men underwent cancer screening, in both cases a decline on 2003 [32]. A total of 19.1 million cancer screening tests were carried out nationwide in Germany in 2004: 16.0 million on women and 3.1 million on men [33].

Since 1991 there has been an increase in the number of people availing themselves of disease-prevention measures. However, this development began at a relatively low level, so that renewed efforts are needed to promote secondary prevention measures. Not all sections of the population take advantage of the available measures to the same extent. There are marked variations related to gender, age and social status (see section 3.3).

► Comprehensive Information on **breast cancer** can be found in booklet 25 of the Federal Health Reporting's series [35].

#### Definition

The primary aim of medical check-ups is the early detection of cardiovascular diseases, diabetes mellitus and kidney diseases – and the risk factors associated with these diseases, such as cigarette consumption, high blood pressure and overweight. The doctor recommends appropriate modifications in the patient's lifestyle and, if necessary, initiates subsequent diagnostic and therapeutic steps.

Medical check-ups were added to the services provided by SHI-accredited physicians in Germany in 1989 and are now one of the benefits available from the SHI pursuant to section 25 of Book V of the German Social Security Code (SGB V). Men and women over 35 are eligible for a check-up once every two years. This includes an examination of the patient's case history (anamnesis), a physical examination, and laboratory checks on cholesterol, blood glucose, uric acid and creatinine levels.

#### **Vaccinations are among the most effective and economical preventive measures.**

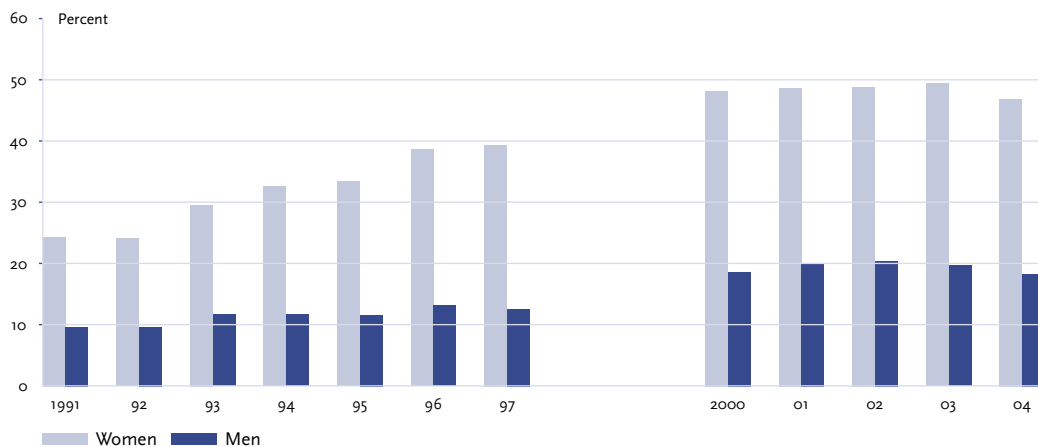
Infections cause 15 million mortalities every year, making this one of the most frequent causes of death in the world. In the industrial nations general improvements in socio-economic and hygienic conditions since the early 20th century have led to a dramatic decline in numerous infectious diseases, largely due to immunization and the increased availability of antibiotics.

Immunization is among the most effective and economical of all preventive measures. Vac-

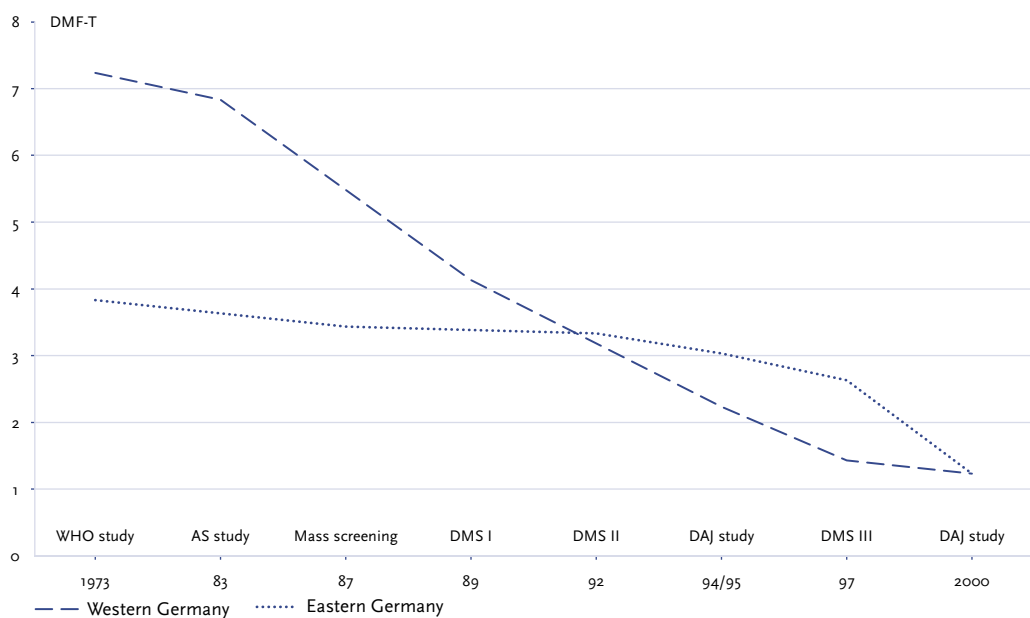
ination activates the body's immune system against certain pathogens and protects the person against the disease in question. It is particularly important in protecting against serious infections for which there are no or only limited treatments. Furthermore, vaccinations prevent complications and severe disease developments in high-risk patients, as well as preventing pregnant women from passing on their infection to their baby. In addition to individual protection, many vaccines offer collective protection (also known as herd immunity) once a certain immunization rate has been reached in

the population, thereby preventing the escalation of epidemics.

There is no compulsory vaccination in Germany. Vaccinations of particular importance are advised by the highest health authorities of the federal states on the basis of recommendations which are constantly being updated by the German Permanent Vaccination Committee (STIKO) at the Robert Koch Institute. General vaccinations recommended by STIKO for children, adolescents and adults are paid for by the majority of statutory health insurers.



**Figure 3.2.7:** Cancer screening participation rates since 1991. Source: Central Research Institute of Ambulatory Health Care in the Germany



**Figure 3.2.8:** Decline of caries prevalence in permanent dentition (DMF-T\*) among 12 year olds in Germany \* DMF-T = Total of decayed, missing and filled teeth caused by caries. Source: WHO 1973; AS study 1983; IDZ surveys 1989, 1992, 1997; DAJ studies 1994, 2000



### 3.2.3 Dental disease prevention

**Caries prophylaxis for children is one of the biggest success stories in preventive medicine.** The aim of dental prevention is to keep teeth healthy. In turn it seeks to reduce the need for restorative treatment, especially in early and middle years, improve the quality of life and have a positive impact on the interaction between oral and general health. Preventive-care measures can reduce caries and periodontitis, although not prevent them altogether.

Oral health in Germany has improved appreciably over the last 20 years. This is shown for instance in the caries rates among 12-year-olds (see Figure 3.2.8).

Around 15 years ago 12-year-olds had an average of four carious teeth (DMF-T score: 4.1 for western Germany). By 2000 the nationwide average had fallen to 1.21 [36]. These figures put Germany below the DMF-T threshold value of 2.0 issued by the World Health Organization in 2000 [37] and internationally among the leading group of nations in oral health (see Table 3.2.1).

**Fluoride salt, cleaning teeth and prophylactic dental measures are the key to this success.** The positive trend in Germany can be traced back to prophylactic measures at the national, group and individual levels and to improved oral health behaviour, including the use of toothpastes containing fluoride.

One example of an effective national prophylactic measure has been the fluoridation of table salt (retailing as iodized salt with fluoride). Its market share reached 60 percent in 2003.

Following changes to German social security legislation in 1989 (financing of group-prophylactic activities by statutory health insurance, section 21 of the SGB V), children and adolescents benefited from information campaigns (e.g. on the right way to brush their teeth) and fluoridation measures (see Table 3.2.2). Cooperation between public health-service dentists, stat-

utory compulsory health insurance funds, public bodies and dentists in private practice has improved over the last decade.

The positive development of oral health among children and adolescents was reinforced in 1991 (section 22 of the SGB V) when statutory health insurers incorporated individual dental prophylaxis (IP) into the services they offer. The range of state-financed prophylactic measures was extended further in 1993. Individual prophylactic measures now include fluoridation measures and preventive fissure sealing of the back molars (IP 5). This made a major contribution towards reducing caries rates [36, 39] (see Figure 3.2.9).

Since being included in the schedule of services provided by the statutory health insurers, many more people have taken the opportunity to have individual prophylactic treatment (see Figure 3.2.10). In western Germany only 8.7 percent of those entitled took the opportunity to have individual prophylactic treatment in the first six months of 1991 (2.3 percent in eastern Germany, no chart); by the first half of 2003, the rate had risen to 39.7 percent (48.7 percent in eastern Germany) (see also Chapter 4: ambulatory dental treatment).

**Up to now, the elderly and socially disadvantaged have not benefited enough from prophylactic treatment.** People who are over 35 years old today are not yet benefiting from the prophylactic activities that were launched in the 1980s. There is even more potential for therapy and prevention among senior citizens; people who require nursing care or are generally restricted in their independence are frequently unable to keep their teeth in a functional condition.

Furthermore, the quality of oral health and dental healthcare is evidently subject to a significant gradient that is dependent on social class, so that an unequal prevalence of caries (and periodontitis) must be assumed in principle across all age groups. Indeed, the high-risk groups most seriously affected by dental diseases, who constitute 20 to 25 percent of any age group, are largely to be found among the poorly educated and low-income groups of the population.

In the future, therefore, prophylactic strategies should concentrate more on the elderly and socially disadvantaged sections of the population, both in terms of condition prevention (e.g. population and group prophylaxis) and behaviour prevention (e.g. diet and oral hygiene). The preventive measures must be backed up by individual prophylactic care from a dentist.

#### Definition

In accordance with the regulations laid down in Book V of the German Social Security Code (SGB V), cancer-screening programmes by statutory health insurers target the forms of cancer that can be reliably detected by diagnostic tools in their precancerous or early stages – and effectively treated. Furthermore, enough doctors and facilities must be available for diagnosis and therapy. Health check-ups and cancer screenings should be offered together wherever possible [34].

Women over 20 and men over 45 who are covered by German statutory health insurance are entitled to regular cancer screenings. These screenings are available for examinations of the genitalia to women over 20, for additional examinations of the breasts and skin to women over 30, and for rectum and colon examinations to women over 50. Women between the ages of 50 and 69 are also entitled to mammography screening if they wish. Men over 45 can have their prostate, external genitalia and skin examined; examinations of the rectum and colon are also available to men over 50.

Following extensive discussion, the revised guidelines for cancer screening in Germany now form the basis for the establishment of nationwide and quality-assured mammography screening – the kind of system that has been in place in other European countries for a long time. Until now Germany's X-ray Ordinance stipulated that a mammography was only to be approved in cases where cancer was already suspected. Mammographies were nevertheless carried out in no small numbers for the purpose of early cancer detection, but were often criticized for their poor quality. With the phased introduction of a nationwide mammography programme for women between the ages of 50 and 70, Germany is also implementing European guidelines.

Country	Year	DMF-T
Austria	2002	1.0
Belgium	2001	1.1
Denmark	2003	0.9
Finland	2000	1.2
France	1998	1.9
Germany	2000	1.2
Greece	2000	2.2 (Attica)
Italy	1996	2.1
Republic of Ireland	2002	1.1–1.3
The Netherlands	2002	0.8
Portugal	1999	1.5
Sweden	2002	1.1
Spain	2000	1.1
United Kingdom	2000/01	0.9

**Table 3.2.1:** Dental caries occurrence among young persons (12 year olds) in Europe. Source : WHO Country Area Profile Programme (CAPP), 2004

Institution	Percentage Rate of Care Provision
Nursery School	68.0%
Primary School	67.1%
5./6 Form	33.3%
Special Schools	41.9%

**Table 3.2.2:** The rate of group prophylactic treatment 2002/2003. Source: German Association for the Dental Hygiene of the Young DAJ [38]

### 3.2.4 Screening children and adolescents

**Ten medical examinations are paid for between a child's birth and his/her 15th year.** The early detection of development and health disorders in children is a crucial aspect of secondary prevention and can help avert permanent damage. A preventive examination programme for infants, babies and pre-school children has been part of the statutory schedule of services provided by German compulsory health insurance funds since 1971 (section 26 of the SGB V). The range covered by the examinations, and the intervals between them, are laid down by the guidelines of the Federal Committee of Physicians and Compulsory Health Insurance Funds (the current version came into effect on 1 April 2005).

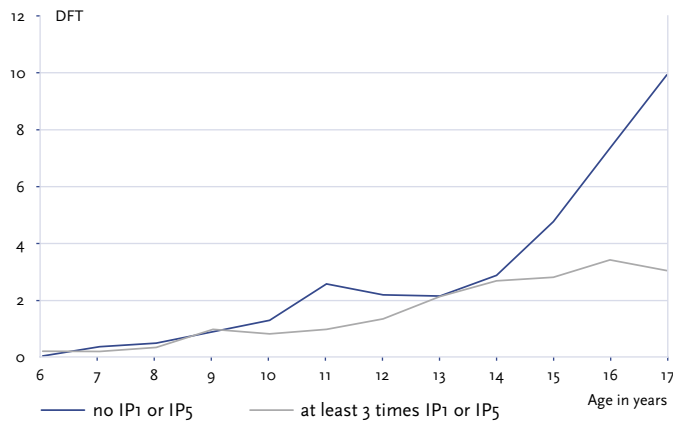
The programme comprises nine examinations of children up to the age of six (U1 to U9) and, since 1 July 1997, a preventive-care examination for 11- to 15-year-olds (J1). The results of the examinations up to the children's sixth year are documented in the preventive-care booklet which is kept by parents and must be submitted before each examination. The intervals between examinations correspond to important development stages in the child's life. U1, the first examination, takes place immediately after birth; U2 between then and the tenth day; U3 to U6 are carried out during the first year at three-monthly intervals. U7 is conducted at the end of the second year, U8 at the end of the fourth year; U9 targets 5-year-olds. Participation is voluntary.

**Preventive examinations are popular, but participation rates are lower among older children.** Data on the participation rates in the screening examinations U3 to U9 are recorded and processed by the National Confederation of Compulsory Health Insurance Funds and the Association of SHI-Accredited Physicians. Since the first two screening examinations (U1 and U2) are chiefly carried out in hospitals, there is no reliable data on participation.

The screening programme for children is widely accepted in the population. However, participation in individual examinations declines as the children grow older. Whereas over 90 per cent of children take part in the examinations in the first two years of their lives (U3–U7), participation rates in subsequent examinations are lower (see Figure 3.3.2).

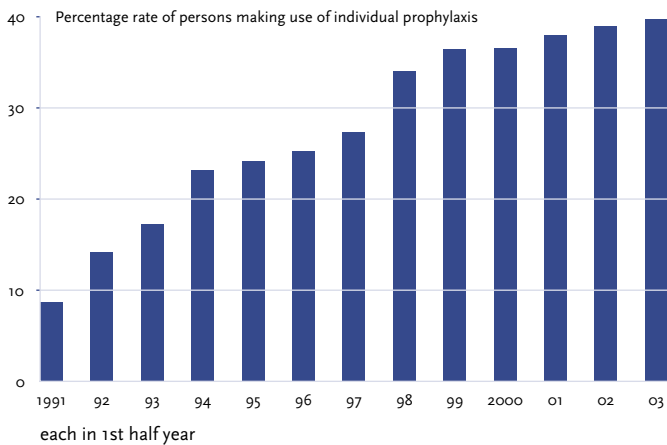
Examination	Time	Availment rate
1 <sup>st</sup> Year of Life		
U 3	4.–6. Week of life	92.6%
U 4	3.–4. Month of Life	93.2%
U 5	6.–7. Month of Life	93.3%
U 6	10.–12. Month of Life	94.7%
2 <sup>nd</sup> Year of Life		
U 7	21.–24. Month of Life	91.2%
4 <sup>th</sup> Year of Life		
U 8	43.–48. Month of Life	82.6%
5 <sup>th</sup> Year of Life		
U 9	60.–64. Month of Life	79.1%

**Table 3.2.3:** Participation rate in preventive care examinations in childhood per examination level. Estimated participation rate for 2001. Source: Central Research Institute of Ambulatory Health Care 2002; Institute's own survey, preliminary result.



DFT = Number of decayed or filled teeth  
 IP1 = Assessment of status of oral hygiene  
 IP5 = Fissure sealing of permanent molars

**Figure 3.2.9:** Caries development as a function of the level of intensity of individual prophylaxes. Source: [40]



**Figure 3.2.10:** Rate entitled persons making use of individual prophylaxis (IP) 1991 – 2003 (Eastern Germany). Source: [41]

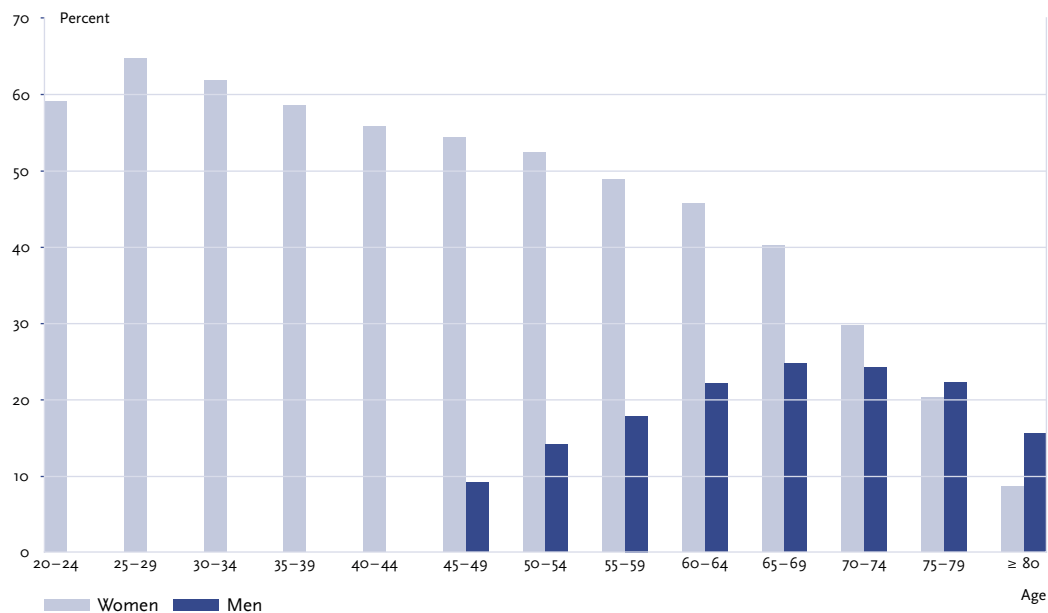
According to some studies the participation rate is also dependent on social position. Socially disadvantaged families and those of foreign origin make significantly less use of the examinations [42, 43].

**The rate of medically problematic findings has been falling for a long time.** According to data for western Germany, the rate of problematic findings in screening programmes has been falling markedly over the last 20 years; in other words, the proportion of children with no medical problems has increased. However, this trend may be partly the result of a change in the way doctors document findings, who perhaps note the mere suspicion of a problem less frequently than in the past. In 1996 95 percent of examinations (U3–U9) produced no problematic findings [44].

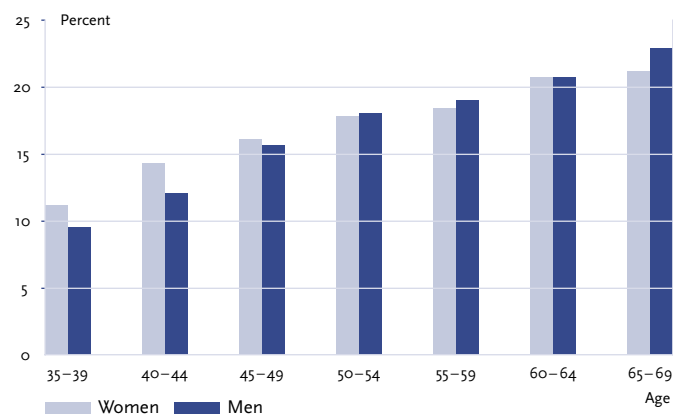
Among the most serious medical problems in a child's first year are organic dysplasias (for example coronary dysplasia and urinary tract anomalies), hip dysplasias, and cerebrally determined movement disorders.

Developmental disorders or retardations become apparent later. The most common defects among U9 children in 1997 were language and speech disorders, detected in 100 of every 10,000 children. This was followed by functional development disorders (43.6 cases per 10,000 children examined), strabismus (squint) (25.3), cerebrally determined movement disorders (24.2) and intellectual underdevelopment (23.3) [45]. The risk of language and speech development disorders is a quarter to a third higher in boys than in girls. U9 results have not been analysed since 1997.

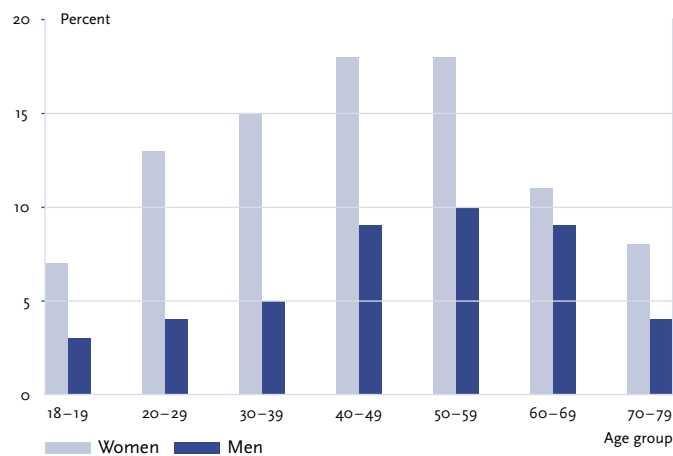
► Comprehensive Information on **children's and adolescents' health** can be found in the special report in the Federal Health Reporting's series [46].



**Figure 3.3.1:** Persons participating in cancer early detection examinations as a percentage of the respective age group, 2004. Source: Central Research Institute of Ambulatory Health Care in Germany



**Figure 3.3.2:** Persons making use of health examinations as a percentage of the respective age group, 2004. Source: Central Research of Ambulatory Health Care in Germany



**Figure 3.3.3:** Participation in health promotion measures as a percentage of the respective age group. Source: RKI; BGSg8 [48]

### 3.3 Use of prevention by specific groups

#### ► Abstract

The German population's rate of participation in disease-prevention and health-promotion measures is quite low on the whole. However, there are variations related to gender, age and social position.

More than 50 percent of women under 50 take the opportunity to undergo cancer screening, with participation sometimes reaching almost 65 percent. The fact that so many women in this age group use the service is probably related to the frequency of their visits to the gynaecologist. Fewer women participate in cancer screening when they are older, i.e. when most cancers actually develop.

More than 20 percent of men do not take up the offer of cancer screening until the age of 60. Men also take advantage of health-promotion measures (e.g. prevention courses offered by the compulsory health insurance funds) less frequently than women. They are less well informed on health matters than women. In general, men are more likely to agree to take part in preventive-care measures if this does not involve any additional effort on their part and can be done, for example, at work or as part of an already planned visit to the doctor.

Socially disadvantaged men and women are less likely than others to take part in health-promotion measures or cancer screening. This suggests a higher inhibition threshold in the lower social strata. Another contributory reason for the lack of demand for available prevention programmes could be insufficient information.

**Young women take part in cancer screening more than any other group.** On the whole women take part in cancer screening more than men. However, the participation rate of women falls below 50 percent among the over-55s (see Figure 3.3.1). This is precisely the age when, for example, the likelihood of developing breast cancer rises significantly.

The percentage of men who undergo cancer screening rises from the age of 45 and begins to fall again above the age of 70.

The relatively high participation rate among young women is probably related to the frequency of visits to the gynaecologist in this age group. Women evidently consult their gynaecologist less frequently after childbearing age. According to the 1998 National Health Interview and Examination Survey, the figure for women visiting a medical practitioner peaks at the age of 40 and falls quite sharply thereafter [47].

Men seeking cancer screening have to specifically choose a specialist in general medicine, internal medicine or urology, a fact that may well raise the inhibition threshold. The number of men consulting urologists increases from the age of 60 [47].

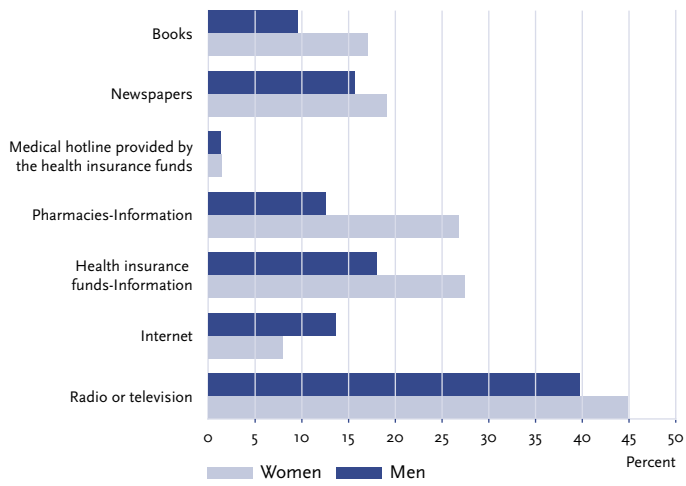
**Check-ups are not especially popular among either men or women.** Even though cancer screening should be carried out together with a check-up for cardiovascular disease, kidney diseases and diabetes (section 25 of the SGB V), there is no certainty that this principle will be implemented. The rate of combined examinations is comparatively high among men: according to data from the Central Healthcare Institute, in 2002 44 percent of all cancer screening for men was carried out together with a medical check-up (paid for every two years by the compulsory health insurance funds). Among women, however, the corresponding rate was only 0.4 percent.

Women up to the 45–49 age group have medical check-ups more frequently than men. Thereafter the proportion of men who have check-ups is slightly higher (see Figure 3.3.2). As a rule the examinations are carried out by general practitioners or specialists in internal medicine. Evaluations based on the Telephone Survey show that, in the younger and middle age groups, women undergo outpatient treatment more often than men (based on the three-month period before the survey). Among the over-65s, men consult a doctor more often than women. The 1998 National Health Interview and Examination Survey [47] yielded similar results, classified according to the physicians' field of practice.

Rates of participation in health-promotion measures are quite low on the whole. Certain specific offers, such as health-related training courses from the compulsory health insurance funds, are more likely to be taken up by women than by men. According to data from the 1998 National Health Interview and Examination Survey, an average of 13.8 percent of women and seven percent of men took part in health-promotion programmes [48] (see also section 3.2.1, Primary prevention).

The highest participation rate is to be found among the 40–59 age group (see Figure 3.3.3). It is worth noting that 45 percent of the women questioned and 38 percent of the men claimed they were willing in principle to bear the individual costs of health-promotion programmes.

**Women are more active than men in obtaining information on health issues.** Analyses of the results of the 2003 Telephone Survey show that women are, on the whole, more active than men when it comes to obtaining information on health issues. They also tend to draw from a broader range of information sources (see Figure 3.3.4). Both sexes make more use of health-related information as they grow older [49].



**Figure 3.3.4:** Frequent use of health information according to different sources (Multiple answer were permitted). Source: Telephone Health Survey 2003 [49]

In general women are prepared to make more use of prevention and health-promotion programmes than men. This should not detract from the fact that there are also various areas in which participation rates should also be increased among women. Among the more elderly especially, reduced mobility and health restrictions can make access to available preventive-care courses more difficult.

**Men want prevention without effort.** Women are often interested in health-promotion courses because of their communicative aspects, whereas men are more likely to take part in preventive measures if they are offered in specific settings (for instance at work) or in conjunction with some form of treatment which is going to take place in any case. It is clear that men are much less willing than women to actively seek out prevention programmes and sign up for them.

For this reason it would be a good idea to find out the kinds of settings in which men could be most effectively encouraged to take part in prevention measures – and medical treatments they might be combined with. Further prevention measures might be offered to men by way of occupational health promotion, which reaches men at work [50]. At the same time workplace prevention measures should be intensified in small and medium-sized businesses with a high proportion of female employees.

**Demand for prevention measures is less widespread among the socially disadvantaged.** According to data from company health-insurance funds, it is above all women in voluntary health insurance schemes who take part in primary prevention courses. By contrast, people living in precarious circumstances are inadequately reached by the opportunities that are available. The results of the 1998 National Health Interview and Examination Survey also indicate a distinct social gradient relating to participation in health-promotion programmes, especially among women [48]. Furthermore, people in lower social classes tend to have poorer oral health and receive a poorer standard of dental care.

The picture is a varied one when it comes to the early detection of disease (secondary prevention). According to data from the 1998 National Health Interview and Examination Survey, men and women from socially privileged groups go for medical examinations less frequently than men and women from socially disadvantaged groups. The reverse is true in the case of cancer screening [48]. These results suggest that a specific desire to undergo cancer screening or to see a particular specialist is less widespread among people from socially disadvantaged groups, although they might have fewer inhibitions about having a check-up if it takes place during a visit to the doctor that is already arranged.

Knowledge of health-related topics is dependent on educational opportunities and access to information; this could certainly also exert an influence on the likelihood of people taking advantage of screening measures. Data from the Telephone Health Survey confirm that well informed people are more likely to make a screening appointment than badly informed people.

**People in eastern and western Germany have different views of the importance of prevention.** There are also differences between eastern and western Germany. 8.6 percent of east German women take part in health-promotion projects, compared to 15.1 percent of west German women. The corresponding figures for men are 4 percent and 7.7 percent respectively. Patients in western Germany are more willing to pay for their own health-promotion measures than in eastern Germany.

When it comes to screening, however, the picture is less clear-cut. While men in western Germany take part in screening programmes more frequently than men in eastern Germany, east German women seem to set greater store by screening than west German women [48].

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**Key statements**

- ▶ There are about 133,000 registered office-based doctors in private practice in Germany, about 118,000 hospital doctors and nearly 65,000 dentists. (Pages 147, 161 and 153)
- ▶ The number of office-based specialists increased between 1990 and 2002 by at least 40 percent. (Page 148)
- ▶ The psychotherapist-to-population ratio is five times higher in western Germany than in eastern Germany. (Page 150)
- ▶ The turnover of pharmaceutical products has risen continually over the last ten years and is now approximately €25 billion per annum. (Page 150)
- ▶ Expenditure by the statutory health insurance funds (SHI) on services in medical gymnastics and physiotherapy approximately doubled during the 1990s. (Page 155)
- ▶ There are now around 10,000 ambulatory nursing-care services in Germany and almost 10,000 nursing homes. (Pages 156 and 167)
- ▶ one hospital bed in seven has been dispensed with since the early 1990s. (Page 159)
- ▶ The average duration of stays in hospital fell from 12.5 to 8.9 days between 1993 and 2003. (Page 161)
- ▶ Since 2005 German clinics and hospitals have been obliged to publish a quality report at two-yearly intervals. (Page 181)

## 4 How has the availability and use of healthcare provision been changing?

### ► Abstract

The health system in Germany has undergone considerable structural changes since the early 1990s. The driving forces behind this development have been the ageing of society, changes in the field of diagnostics, therapy and medical technology, and economic pressures on the entire social insurance structure.

The social security system is determined in part by governmental health policy and in part by economic conditions. Traditionally, the system is torn between what is expected from a free market economy and what is expected from a welfare state [1]. Almost the entire population of Germany is insured against illness, the great majority of the population being in the statutory health insurance system [2].

Ambulatory healthcare was affected by numerous changes in the law between 1992 and 2004. Debate in the last few years has centred on a standing charge for visits to a doctor, the gatekeeper model, increased co-payments, and medication and budget allocations for doctors. The transfer to a case-based lump sum reimbursement system (classification according to diagnostic related groups – DRGs) for inpatient clinic and hospital services has been at the centre of the debate on the financing of inpatient care for the last five years.

On the whole, specialist ambulatory treatment has increased, while the number of general practitioners (GPs) has remained constant. The quarterly flat-rate charge to SHI patients for ambulatory treatment introduced in 2004 has led to a reduction in the number of patients consulting a specialist directly and an increase in those referred to a specialist by their doctor. It remains to be seen whether this trend will continue.

The number of medical and non-medical psychotherapists has also increased, especially in western Germany. This is related to the law on psychotherapy, which has been in force since 1999 and included non-medical psychotherapists in the public medical-care service.

The turnover of medication increased continually between 1992 and 2003. The increase was predominantly a consequence of changes in the type and price of medicines prescribed. In terms of recommended daily doses, however, the number of prescribed packets or the volume of prescriptions calculated has not changed much at all.

In the field of prescription-free medication there has been an observable trend towards self-medication.

The number of office-based dentists in private practice has also increased over the last ten years by an average of 1.5 percent per annum. On the other hand, there are now fewer dental practitioners working in the public health service. The number of fill-

ings and extractions is declining, a sign of improved oral health among Germans.

Among non-medical professions there has been an appreciable rise in the number of male and female geriatric nurses. The reason for this is the introduction of a nursing-care insurance in 1995 and the more intensive care of geriatric patients connected with it.

The picture in inpatient healthcare is marked by various trends. The number of both hospitals and hospital beds has fallen since the early 1990s, while the number of nursing homes and nursing-home places has risen appreciably over the same period.

Hospitals closing and not being replaced and hospital mergers are the two causes of the decline in the number of hospitals in Germany. The main reason for the merger process are modifications in the general legal framework to create a performance-oriented system of hospital financing. In the same period, the number of cases treated and the proportion of elderly patients in hospital clinics have risen, while the lengths of hospital stay have been reduced. This places great demands on hospitals and hospital staff.

Not all branches of medicine have been equally affected by the reduction in the number of hospital beds over the last ten years. In paediatrics and psychiatry, for instance, the demand for beds has fallen appreciably. Some hospital wards were closed in order to maintain performance capacity, while the number of available treatments on offer in plastic, neurosurgery and psychotherapeutic medicine have increased. The number of beds per capita in Germany is still higher than in other western industrialized countries. The strict distinction between inpatient and ambulatory treatment which used to apply is gradually disappearing. Since the Health Structure Act became law in 1993, hospitals have been permitted to perform outpatient surgery. The fact that the majority of rehabilitation measures take place in hospital has historical roots in Germany and is partly enshrined in social law. However, ambulant and semi-inpatient rehabilitation are now available within reach of home.

Systematically developed guiding principles for treatment are playing an increasing role in quality assurance. They define clinical pathways when decisions on therapy have to be made, and are intended to improve the results of treatment.

For the time being there are still no reliable figures on the frequency of medical malpractice, but a growing number of clinics and hospitals have their own critical-incident reporting systems. These are intended to identify situations in day-to-day care where errors occur and in this way help prevent incorrect treatment from occurring in the first place.



## 4.1 Availability and use of ambulatory services

### ► Abstract

The number of doctors in Germany who perform ambulatory treatment rose constantly throughout the 1990s; by 2004 the figure had reached 133,400. The increase stems principally from the larger number of specialists in private practice. In order to ensure the future of the general practitioner, especially in eastern Germany, measures are currently being discussed to help cope with problems of succession in certain areas of the country.

The number of cases of ambulatory treatment rose continually during the 1990s. According to the first analyses, there has been a subsequent decline since the introduction, in 2004, of the quarterly flat-rate charge to SHI patients for ambulatory treatment. The number of certified psychotherapists rose sharply following the passing of the Psychotherapy Act of 1999, which included non-medical psychotherapists in the system of statutory health insurance benefits. The psychotherapist-to-population ratio is five times higher in western than in eastern Germany.

During the last decade the annual turnover in pharmaceutical products has risen to €25 billion, whereas the prescription volume calculated by the DDD (Defined Daily Dose) has remained almost unchanged. The increase in turnover stems mainly from the prescription of newer and more costly medication. As a result of the 2002 Act on the Stabilizing of Contributions to Statutory Health Insurers, which provides for higher reimbursements to be paid to the statutory health insurers for medication, there has been a slow-down in statutory health insurance (GKV) expenditure on medication.

As a rule, prescription-free medication has not been covered by statutory health insurance since 2004; since that time the people insured have had to bear the costs themselves. A trend towards self-medication by the patient had already developed in previous years. In 2004 the sale of self-medication accounted for a sixth of the turnover in Germany's pharmacies (over 21,000).

There were a total of 64,609 practising dentists in Germany at the end of 2003. The number has risen constantly since the 1990s and may be expected to continue to rise in the future, particularly the number of female dentists.

The trend in the number of both extractions and fillings suggests a long-term decrease, which can be considered an indication of the population's improved oral health. The number of newly completed total prostheses is also decreasing; periodontal treatment, on the other hand, is on the increase.

Physiotherapy is visibly gaining in importance. There were 60,000 physiotherapists, masseurs and balneologists active in ambulatory care in 2003. Expenditure on physiotherapeutic services by the statutory health insurance funds almost doubled between 1993 and 1999, rising from €924 million to €1.8 billion.

The independent midwife is also in greater demand, a fact that can be explained by the increasing popularity of home births, birth centres and various forms of ambulatory and inpatient obstetrics. In Germany there are around 10,000 registered ambulatory nursing services as defined in Book XI of the Social Code; they provide the insured individuals with a service not only in cases where nursing care is necessary, but also in cases of illness. The greater part of home care in cases of illness is devoted to so-called safeguarding home care (1.8 million cases p.a.). It serves directly as a back-up to ambulatory treatment by a doctor.

### 4.1.1 Ambulatory medical healthcare

*The doctor's surgery is a hub of healthcare.* Doctors' surgeries play a leading role in ambulatory healthcare. They perform – or cause to be performed (by referral or prescription) – a major part of the medical services of the health system.

The overwhelming majority of office-based doctors in their role as SHI-accredited doctors provide care for those in the statutory health system. The German Social Security Code (sections 70 to 75 of the SGB V) guarantees the provision of care and regulates coordination between doctors, statutory health insurance funds, associations of statutory health doctors and national associations of statutory health doctors.

In 2004 133,400 doctors were working in ambulatory healthcare; of these 117,900 were working in the statutory health system, 7,500 in private medical practice and 8,000 were medical employees. The number of doctors who work in a purely private capacity is still extremely low but it has risen appreciably since 2001 (from 5,700 to 7,500). Female doctors make up 35 percent of doctors working in the ambulatory sector.

A total of 653,000 persons were working in doctors' surgeries in Germany in 2003, 79 percent of them women. The largest group of non-medical employees are the 277,000 doctors' assistants. In addition, there are nursing-care staff, medical-technical staff, social workers and members of other professions who are employed in doctors' surgeries.

*A generation changeover is on the way in the field of ambulatory healthcare.* The average age of an SHI-accredited doctor rose from 46.6 to 50.6 between 1993 and 2004 [3], so many doctors will shortly be looking forward to retirement. A shortage of doctors is expected to ensue, especially in the field of GP care and in eastern Germany where about a third of all GPs will be retiring soon [3]. According to planning in the state of Mecklenburg-Western Pomerania there will be 147 general practitioners in 2010, too few to maintain elementary health care [4].

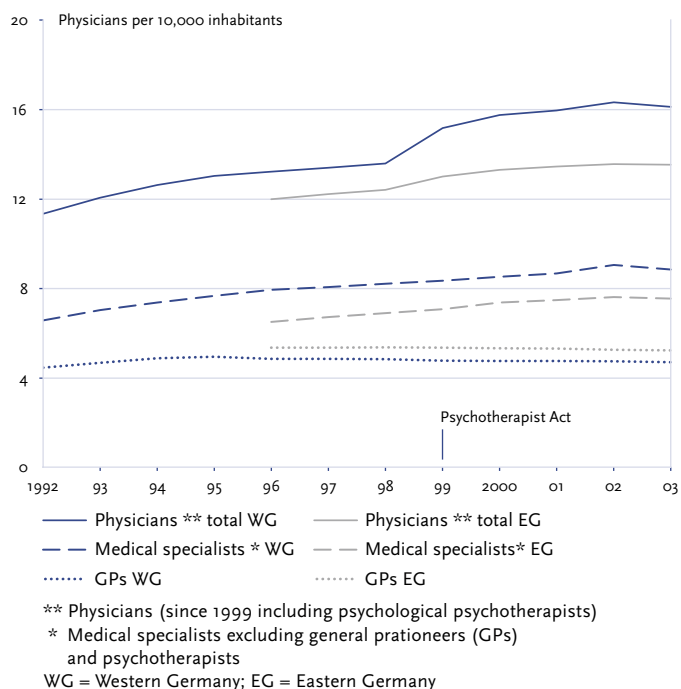
In 2003 around five percent of all SHI-accredited doctors were entitled to treat patients in hospital. The doctors who have special rights of admission are for the most part ear, nose and

### Data basis and notes on method

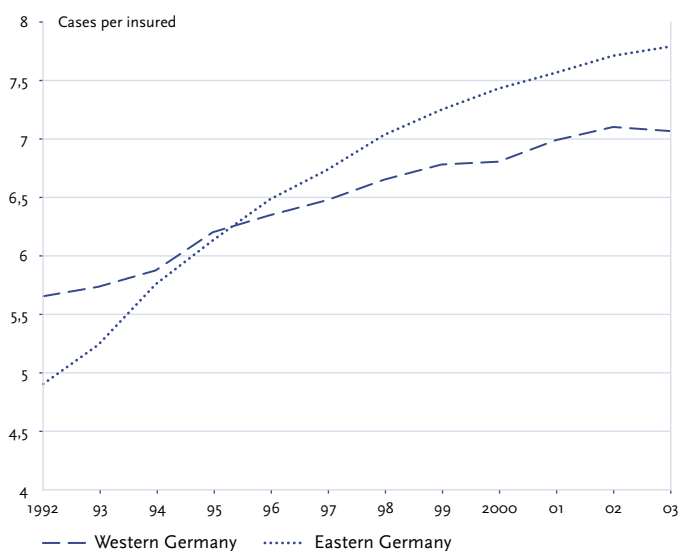
Data currently available on the supply and use of ambulatory care services come from various service providers. Up to now it has not been possible to integrate such data, which means that only certain specific global aspects of healthcare procedure can be analysed. New legal requirements (Statutory Health Insurance Modernization Act, section 303 a-f) regulating the use of data have been agreed to enable the presentation of a coherent and detailed picture in the future. Under the terms of the

Act, data giving details of medical fees and medical performance are to be interconnected/colated through the explicit relation to the given patients and service providers, the anonymity of the insured persons being maintained by using a pseudonym or by separating the data. Data coordinated in such a way would then be made available, for example, to the health insurers, the medical profession, health-monitoring institutions at national and state level and to scientific establishments.

The following analysis covers the period from 1992 to 2003/2004. 1992 was chosen as the starting date to exclude, as far as possible, distortions created by the upheavals that came in the wake of German reunification. The simplistic breakdown of the available data only allows for a regional comparison between western and eastern Germany. Convergent tendencies between east and west can be shown using this comparison.



**Figure 4.1.1:** Physicians and medical specialists in private practice per 100,000 inhabitants by specialist field and region. Source: KBV



**Figure 4.1.2:** Ambulatory medical treatment cases per insured. Source: KBV

throat specialists, gynaecologists, ophthalmologists, orthopaedic surgeons, surgeons and urologists. Conversely, about eight percent of all hospital doctors are entitled to undertake ambulatory work, for example at times when doctors' surgeries are usually closed [5].

**The number of specialists per 10,000 inhabitants has risen constantly since the 1990s.** The total number of office-based doctors (including psychological psychotherapists) per 10,000 inhabitants has risen constantly since 1992 (see Figure 4.1.1). This trend also applies to eastern Germany, where the number of doctors per 10,000 is generally lower.

The increase in the number of doctors per 10,000 inhabitants is largely a result of the increase in the number of specialist services available. The total number of registered doctors in private practice rose by 31 percent from 1990 to 2002, the increase amounting to 14 percent for general practitioners and 43 percent for specialists [5]. The Psychotherapy Act, in force since 1999, which included non-medical psychotherapists in health care offered by statutory health insurance (see Figure 4.1.2), has contributed significantly to the increase in the number of doctors. There are more general practitioners per 10,000 inhabitants in eastern Germany than in western Germany, whereby general practitioners in eastern Germany provide a larger part of general healthcare than do GPs in the west.

The number of general practitioners and practising doctors – contained in the total figure of registered doctors in the public health service – fell from 41.8 percent to 36.7 percent between 1992 and 2003. These figures do not reveal the true extent of family doctors' services, however, since not only general practitioners but also paediatricians and some internists take part in the provision of family-doctor healthcare. In accordance with section 73 of the SGB V, the focus is specifically on the provision of general patient care, taking into consideration the patient's personal and family situation. It includes the coordination of diagnostic, therapeutic and nursing-care measures, and the collection and conflation of treatment data. In 2004 about half of the SHI-accredited doctors were family doctors, the other half were specialists [3].

#### 4.1.1.1 GP-centred healthcare

**The statutory health insurance funds are obliged to offer a GP-centred model of care.** Since the introduction in Germany of the Act for the Modernization of the Social Health Insurance System in 2004, the statutory health insurance funds have been obliged to offer so-called gatekeeper models (section 73b of the SGB V). Insured persons taking part in this system first have to consult their general practitioner when they have a health problem. Their GP then decides on the course of examination and treatment and whether to issue a referral to a specialist. The patients are committed to the model for at least a year, in return for which the insurance fund can offer a bonus or waive the fixed quarterly charge for surgery visits (section 65a of the SGB V).

In order to ensure the maintenance of GP-centred healthcare, the statutory health insurance funds enter into contracts with especially highly qualified doctors or medical-care centres. The quality requirements are defined in such a way as to guarantee a good and comprehensive GP-centred healthcare service.

**In around half of the cases, patients go directly to a specialist.** In a survey carried out in 1997/1998, over 90 percent of the adults questioned stated that they had a general practitioner whom they would, as a rule, go to see first if they had a health problem [6]. The number of cases recorded in the statistics of the Scientific Institute of the AOK for 1998, however, showed

that insured persons in western Germany consulted a specialist directly in 48 percent of cases. In 15 percent of cases the patient went to the specialist with a referral, and in nearly 37 percent of cases a general practitioner completed the treatment [7, 8].

Although patients seem to accord the GP a prominent role in primary care, they often decide to consult a specialist directly without being referred by their GP. When considering the figures, however, it needs to be borne in mind that some specialists whose area of competence is very clearly demarcated (for example gynaecologist or oculist) obviously do not require a doctor's referral. Furthermore, a number of qualified internists offer GP care.

#### 4.1.1.2. Use of ambulatory treatment

**The number of cases of treatment has risen faster in the east than in the west.** The number of cases of treatment in ambulatory care rose appreciably during the 1990s (see Figure 4.1.2). The number of cases can be calculated directly from accounting data, not forgetting, however, that long-term patients will be counted as a new case in each quarter of the year, and that the involvement of a specialist in the treatment is regarded as a separate case in each instance. An increase in the number of cases may therefore be the result of a higher demand on the part of patients for ambulatory medical services, but it may also be due to the fact that there are more referrals by GPs, or because there has been more renewals of individual cases. The number of doctors or specialists per square mile in a given area may also influence the statistics showing the number of cases of treatment in that area.

The marked increase in the number of cases in eastern Germany cannot be fully explained by the relatively rapid increase (compared to western Germany) in the number of specialists. Much of the increase was probably caused by a higher demand for care. The development of the figures for cases of treatment corresponds in part to the development of the number of working days lost through sick leave in eastern and in western Germany (see section 1.3.1: since the mid-1990s more days have been lost through sick leave in eastern than in western Germany). What the invoice data available cannot show is the extent to which ambulatory treatment is influenced by the state of health and social circumstances of particular sections of the population.

According to data from the 1998 National Health Interview and Examination Survey, the level of physician-patient contact in eastern Germany is somewhat higher than in western Germany. Physician-patient contact is understood here to include the use of a physician's services on a given day. For example, picking up a prescription or advice given over the telephone would be included as a contact. There is a particularly large east-west difference in the level of physician-patient contacts for general practitioners [9].

**The number of cases of treatment fell after the introduction of the quarterly flat-rate charge.** Since the beginning of 2004, insured persons over the age of 18 are obliged to pay a quarterly flat-rate charge for the first consultation of a doctor, unless they are referred (section 28 of the SGB V). The charge has a steering function and is intended to help cut costs in the healthcare system.

How the quarterly flat-rate charge worked in practice in 2004 is shown by a random sample survey carried out by the Central Research Institute of Ambulatory Healthcare.

According to the survey the average number of cases of treatment was 8.7 percent lower in 2004 than in 2003, although the

number of doctor-patient contacts actually fell by only 2.9 percent over the same period and the number of GP-patient contacts actually rose by 1.3 percent.

The falling number of cases of treatment particularly affected so-called primary medical specialists. Before the introduction of the charge, it had been quite normal for patients to consult them without a referral. The number of referrals has now risen; visits to a doctor with a referral are not subject to a standing charge. An age-specific analysis shows that doctor-patient contact among middle-aged patients has fallen sharply, while no change has been noted among elderly patients in this respect [10].

Data from the Bertelsmann Health Policy Monitor point to the same conclusion. According to these data, the average number of specialist-patient contacts without a referral fell by approximately half between 2002 and 2004, whereas the average number of specialist-patient contacts with a referral practically doubled.

Altogether those questioned in 2004 indicated an average of 6.1 visits to a doctor over the previous 12 months [11], 4.89 doctor-patient contacts for men and 6.95 for women, which can be seen as a slight decrease compared to both previous years (2003: 6.60 contacts; 2002: 6.61 contacts; men 5.45 and 5.49, women 7.49 and 7.50 respectively).

In 2004 the number of doctor-patient contacts evidently continued to decrease. In the seventh wave of the Bertelsmann Health Monitor conducted in the autumn of 2004, those taking part gave an average of practically one contact less than in the spring (wave 6), although it is too early to tell whether this signifies a permanent trend.

**In the case of illness, Germans are less inclined to go to see doctor than they used to be.** In the microcensuses of 1995, 1999 and 2003, persons who were ill were asked whether they had been to see a registered doctor about their illness in the last four weeks [12]. In 1995 72.6 percent said yes. In 1999 it was 68.2 percent and in 2003 only 66.2 percent.

This trend towards lower numbers in ambulatory treatment can be seen to affect both men and women of all age groups, yet the number of doctor-patient contacts in Germany is still higher than the EU average [13]. It cannot be determined from the available microcensus data whether the trend is a result of the fact that patients no longer consult a doctor for minor ailments, or whether it points to a shift from ambulatory to inpatient treatment [12].

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#### Definition

Doctor-patient contacts are defined here as the number of times an insured person makes contact with a doctor in a given period of time (financial quarter or year). Contact here includes home visits and visits to the surgery or consulting room for the purpose of obtaining advice, diagnosis, therapy, prescriptions, and also advice given over the telephone. Doctor-patient contacts are not necessarily direct personal contacts between the insured person and a doctor; they can also be contacts with given establishments. Here, a case of treatment is understood to refer to the use of medical treatment services (at least one doctor-patient contact) in a health-system establishment in one financial quarter.

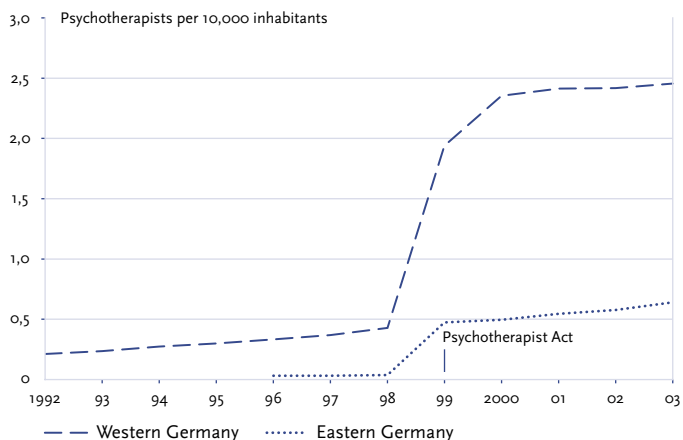


Figure 4.1.3: Psychotherapists per 10,000 inhabitants. Source: KBV

#### 4.1.2 Ambulatory psychotherapeutic care

**The number of SHI-accredited psychotherapists has soared.** The Psychotherapy Act, which became law on 1 January 1999, considerably changed the status of ambulatory psychotherapeutic care. The Act made provision for two independent healthcare professions, the psychological psychotherapist and the child and adolescent psychotherapist. Like “medical psychotherapist”, an official designation since 1967, these are officially protected titles with standardized levels of training and qualifications specific to them.

In addition, the Psychotherapy Act regulates the integration of the two new professions into the existing system of ambulatory care provided by office-based doctors. Psychological therapists and child and adolescent psychotherapists (who are not doctors but psychologists or educationalists) were thus included in the statutory health system as equal partners with SHI-accredited doctors.

In 2003 there were 12,249 psychological psychotherapists registered in the statutory health system (8,160 women and 4,089 men), and 2,464 child and adolescent psychotherapists (1,773 women and 691 men) were active in ambulatory psychotherapeutic healthcare [15].

In addition, there were 2,290 female office-based doctors and 1,316 male office-based doctors practising exclusively in the field of psychotherapy. This group includes specialists in psychotherapeutic medicine, psychiatry, child and adolescent psychiatry and child and adolescent psychotherapy, as well as office-based doctors with an additional qualification in psychotherapy or psychoanalysis.

An additional 6,581 office-based specialists were active in psychotherapy part of the time, including neurologists and consultants for psychiatry and psychotherapy who also carry out somatic-medical work. The exact extent of the psychotherapeutic aspect of the work of this group of doctors is not known [15].

The number of registered psychotherapists has risen considerably since 1999 (see Figure 4.1.3.) as a result of the integration into the statutory healthcare system of psychological psychotherapists and child psychotherapists working in child and adolescent psychotherapy.

**The ratio of psychotherapists to the population is five times higher in western than in eastern Germany.** The number of practising ambulatory psychotherapists per 10,000 inhabitants is nearly five times higher in western Germany than in eastern Germany. This can be explained at least in part by different traditions of care in the field of psychotherapy. Another factor may be that of the needs-related planning of the National Association of Statutory Health Insurance Doctors, which makes provision for fewer psychotherapists in rural areas. This might have an influence on the health service provider-to-population ratio, since the rate of urbanization is lower in eastern Germany.

In 1999 the National Association of Statutory Health Insurance Doctors recorded 321,881 cases of treatment in the field of in-depth psychology-based psychotherapy and analytical psychotherapy, as well as 244,024 cases of treatment in the field of behaviour therapy [16]. More up-to-date figures are not available.

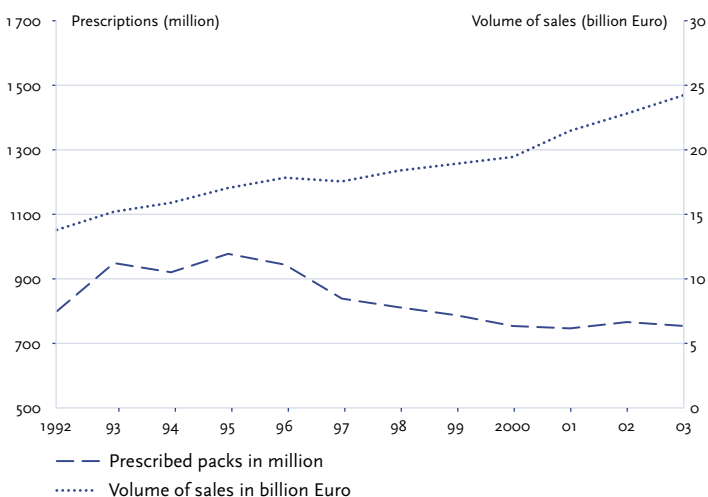


Figure 4.1.4: Development of prescriptions for medication and turnover, Total market of statutory health insurance (SHI), Prescriptions with proprietary medicinal products. Source: Statutory Health Insurance Drugs Index, AOK scientific institute: (Federal Statistical Office IS-GBE)

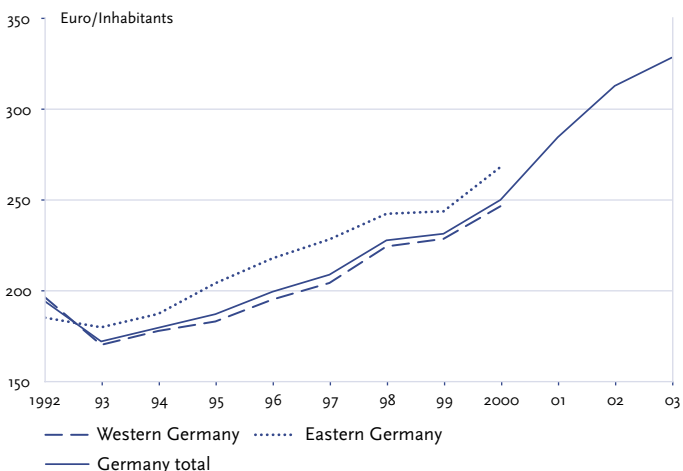


Figure 4.1.5: Expenditure per inhabitant and year for prescription-only drugs. Source: German Association of Pharmaceutical Manufacturers e.V. (Federal Statistical Office, IS-GBE)



### 4.1.3 Medication

**The turnover in pharmaceutical products rises when new and costly medication is prescribed.** The use of medication can be measured by referring to the turnover figures, the number of prescribed packets and the prescription volume calculated using the DDD (defined daily dose). Turnover in pharmaceutical products rose between 1992 and 2003, although the number of prescribed packets decreased over the same period (see Figure 4.1.4).

According to data from the Federal Union of German Associations of Pharmacists, the number of prescribed packets of medication per statutory health insurance member fell from 20.6 in 1992 to 14.35 in 2004, while the order volume rose from 29.5 billion DDDs in 1992 to 31.4 billion in 2003.

The marked increase in turnover can be explained, above all, by the increased value of the prescribed packets. In every group of medication there has been a marked shift towards more up-to-date and more expensive medication. Modifications in packet sizes have also had an influence on turnover figures.

**Statutory health insurance expenditure on medication has risen appreciably in recent years despite government measures aimed at curbing the upward trend.** With the 2002 Act on the Safeguarding of Contribution Rates, reimbursement payments to the health insurance funds were introduced at the manufacturing and wholesale level and the reimbursement conceded by/to pharmacists was raised (section 130 and 130a of the BSichG). As a result, the total amount reimbursed by statutory health insurance rose from € 1.344 billion in 2002 to € 3.108 billion in 2003.

The growing proportion of generic drugs (medications made of patent-free agents) has also helped to curb expenditure, as has the reduction in prescriptions for sexual hormones in hormone therapy. Generic medication constituted over 50 percent of all prescriptions for medication in 2003 [17].

Despite all this, statutory health expenditure per member rose between 1994 and 2004 by 43.7 percent. Most prescriptions are for painkillers and high blood pressure medication; antibiotics rank third, gastrointestinal drugs are in fourth place, and psychotropic drugs fifth. General practitioners prescribed nearly half of all the medication paid for from statutory health insurance budgets.

Differences between western and eastern Germany in medication turnover can be observed by referring to per capita expenditure, which was documented separately until 2000 (see Figure 4.1.5). These records show that more money was spent on medication per inhabitant in eastern Germany than in western Germany.

**Medication that can be obtained directly over the counter is paid for almost exclusively by the patient.** Some medication can be obtained without a prescription and bought over the counter (OTC) from a pharmacist. In the past a doctor could prescribe such medication, but since 2004 it is no longer covered by the SHI schedule of benefits and patients have to pay for it out of their own pockets. OTC medication that is acknowledged as part of a standard therapy for certain severe illnesses is exempt from the new ruling.

In 2001 18 percent of all packets of medication sold were non-prescription OTC drugs. 38 percent were purchased by patients on their own initiative (self-medication) and 44 percent were bought on prescription.

Due to their low price, prescription-free drugs make up a correspondingly small part of total pharmaceutical turnover. Although prescription-free drugs made up about a quarter of all prescribed medication paid for by statutory health insurers up to 2003, their actual share of turnover was only nine percent.

The decline in the number of pharmaceutical prescriptions observed during the 1990s mainly affected prescription-free drugs (see Figure 4.1.6) [17].

**There is a growing trend towards self-medication.** A growing trend towards self-medication could be observed during the 1990s. According to information from the Federal Union of German Associations of Pharmacists, the number of packets of medication bought by patients of their own accord in public pharmacies rose from 450 million in 1992 to 638 million in 2003. Annual self-medication expenditure rose in the same period from € 38.5 to € 47.9 per capita. On average, west Germans spent appreciably more on self-medication than east Germans (see Figure 4.1.7).

### **Health-conscious people with a higher socio-economic status living in urban areas consult specialists more often.**

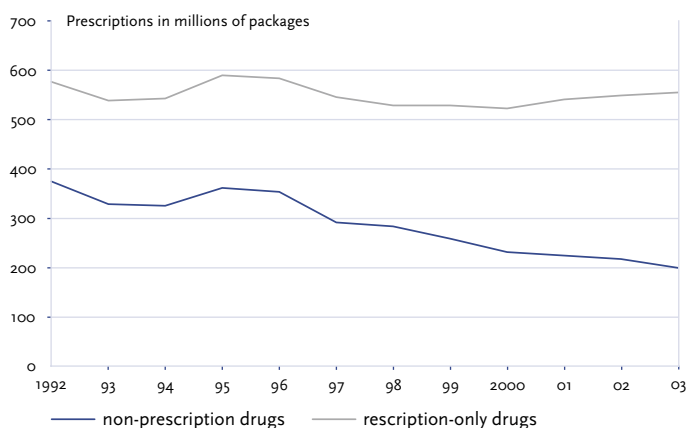
Along with evident decisive factors such as the number of times a person falls ill, whether and how often an insured person will consult a specific doctor is determined to some extent by a person's age and gender, what a doctor has to offer, and a range of other variables. An analysis carried out by the Robert Koch Institute [9] based on multi-faceted data from the 1998 National Health Interview and Examination Survey [14], examined social and behaviour-related influences in particular to see what role they played.

It emerged from this that people in employment consult a doctor less often than the unemployed. Differences between town and country also have an influence: in Germany people living in the country go to the doctor as often as people living in urban areas, but they consult an internist less often. What is more, visits to the doctor are less frequent in the country and various kinds of specialists are consulted less frequently in the country compared to urban areas.

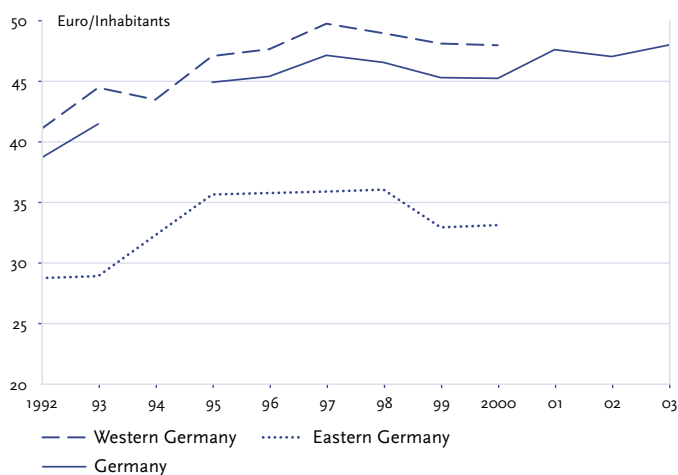
There are also differences in relation to social standing. Whilst the total number of times a person consults a doctor is not influenced by their social situation, people with a

higher socio-economic status are more likely to contact an internist or one of the various kinds of specialists than people with a lower socio-economic status, who are more likely to go to a general practitioner.

A similar pattern can be discerned in relation to health behaviour. People who are health-conscious are more likely to consult an internist and a greater number of different kinds of specialists than smokers or the physically inactive. However, the average total number of doctors consulted is not affected by the different kinds of lifestyle and behaviour.



**Figure 4.1.6:** Time trend of the prescription of prescription-only and non-prescription drugs. Source: Schwabe, Paffrath 2004



\* Expenditure per person is not indicated for 1994 owing to modifications in the calculation basis of estimations

**Figure 4.1.7:** Expenditure per person and per year in pharmacies on self-medication\*. Source: German Association on non-Prescription Medicine Manufacturers. (Federal Statistical Office, IS-GBE)

#### 4.1.4 Pharmacies

**The number of pharmacies per square mile is higher in western than in eastern Germany.** Until 2003 the Pharmacy Act did not allow a pharmacist to operate more than one pharmacy. This ban on multi-ownership was relaxed by the introduction of the Healthcare Reform Act, so that pharmacists are now permitted to own up to four pharmacies, as long as each has the personnel and equipment corresponding to those of a typical public pharmacy.

The number of pharmacies in western Germany remained constant at around 18,000 from 1992 onwards, but in eastern Germany the number rose from 2,187 in 1992 to 3,281 in 2002. In 2004 the total number of pharmacies officially operating nationwide was 21,392.

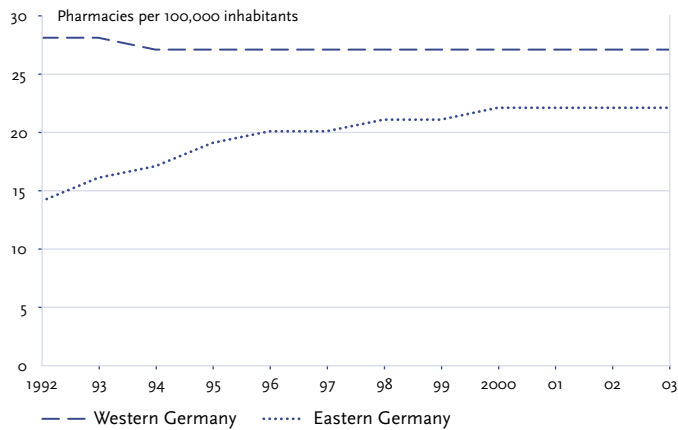
The number of people employed in pharmacies also rose, from 126,536 in 1992 to 136,804 in 2004. According to data from the Federal Union of German Associations of Pharmacists, pharmacists made up 65 percent of the people employed in pharmacies in 2004.

In 1992, the number of pharmacies per square mile was about twice as high in western Germany than in eastern Germany. Since 1994 in the west and 2000 in the east the figures have stabilized at a constant level, but the pharmacy-to-population ratio in eastern Germany remains significantly lower than in western Germany (see Figure 4.1.8).

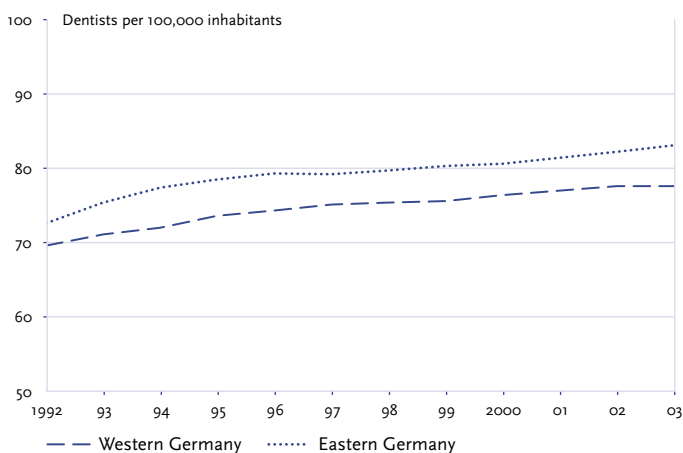
**A sixth of the turnover of pharmacies is generated by medication paid for by the end user.** As far as obtaining medication is concerned, mail order and electronic orders (Internet) are gaining in general popularity. Articles 20 to 23 of the Statutory Health Insurance Modernization Act, which came into force in 2004, only permit the buying and selling of medication via mail order and computer if it is legally obtainable through pharmacies. As medication only available on prescription is also legally obtainable only through pharmacies, the same legal regulations basically apply here, too.

Mail ordering of medication and medical products that could be sold outside of registered pharmacies, however, was legally permitted before 2004. In Germany, all mail-order pharmacies are also standard pharmacies and subject to the same regulations. Only pharmacies located in member states of the European Union or the European Economic Area are permitted to send their products to German end users. Only medical products which are legally bought and sold in Germany may also be imported into Germany.

The turnover of pharmacies (excluding VAT) rose from €20.96 billion in 1992 to €32.5 billion in 2004. Of the €32.5 billion, €25.1 billion stemmed from prescriptions for medication covered by private and statutory insurance, €5 billion from self-medication and €1.1 billion from the usual complementary products sold in pharmacies.



**Figure 4.1.8:** Pharmacies per 100,000 inhabitants. Source: Federal Union of German Associations of Pharmacists (Federal Statistical Office, IS-GBE)



**Figure 4.1.9:** Practising dentists per 100,000 inhabitants. Source: Data file on dentists from the Federal Dental Chamber (Federal Statistical Office, IS-GBE)

#### 4.1.5 Dental healthcare

**There are around 65,000 practising dentists in Germany.** In 2003 there were 80,515 dentists in Germany, 64,609 of whom were practising: 40,428 men, 24,181 women. There were 55,050 SHI-accredited dentists at the end of 2003, of whom 45,055 were in western Germany including Berlin and 9,995 were practising in eastern Germany. Of the approx. 4.2 million people working in the German healthcare system in 2003, about 326,000 of them were in dental surgeries. The proportion of women was 80.7 percent.

The Dental Service for Children and Young Persons provided by the Public Health Office regularly carries out mass examinations and is responsible for group prophylaxis in kindergartens and schools. Referrals are issued for family dentists when the need for treatment is apparent. The number of positions for dentists in public practice fell continually from 642 full-time positions in 1991 to 455 in 2004.

**Dental medicine is becoming a profession for women.** The number of practising dentists rose from 72.6 to 78.3 per 100,000 inhabitants between 1995 and 2003. The total number of dentists in western Germany not including East Berlin rose by 6,016 between 1993 and 2003, an average increase of 1.5 percent a year [18].

The upward trend can be expected to continue. According to a prognosis by the Institute of German Dentists, the number of dental practitioners in 2020 could be between 6 to 15 percent higher than in 2001. The proportion of women to men in the profession is likely to rise, given that 60 percent of those currently studying dental medicine are women [19].

There are more dentists to the square mile in eastern Germany than in western Germany (see Figure 4.1.9), a difference which probably can be explained by the lower population ratio in eastern Germany. Since dental care treatment is part of basic healthcare provision, dental surgeries have to be accessible even in more thinly populated areas. This leads to a higher dentist to population ratio per head of the population in those areas.

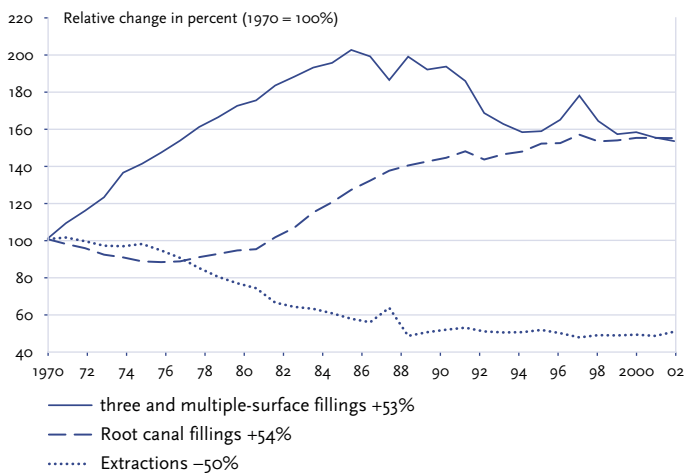
The average number of potential patients per registered dentist was about 1,600 during the 1990s, a figure that has subsequently fallen by about a quarter, so that there were 1,277 inhabitants per dentist by the end of 2003; in western Germany including Berlin, the figure was 1,293, in eastern Germany 1,202 [18].

**The Germans have healthier teeth than in the past.** It is possible to estimate the state of a population's oral health on the basis of the number of fillings, root-canal treatments and extractions carried out. The number of root-canal treatments in western Germany has risen since the 1980s (see Figure 4.1.10), but the number of extractions is falling appreciably in both western and eastern Germany.

The number of fillings is also diminishing in the long term. Between 1997 and 2003 the total number of fillings for which the statutory health insurance was invoiced fell from 67.9 million to around 60.2 million (of which 0.13 percent were composite fillings).

Over the same period, the ratio of extractions to fillings fell from 1:5.8 to 1:4.2. This can be taken as an indication of an appreciably better standard of oral hygiene in the German population [18]. In addition, due to improvements in the quality of treatment and dental prophylaxis, fillings now have a longer life span than before.

The proportion of statutory health insurance expenditure on dentures fell from 36.5 percent in 1997 to 31.9 percent in 2003. In the course of the last ten years, the importance of remova-

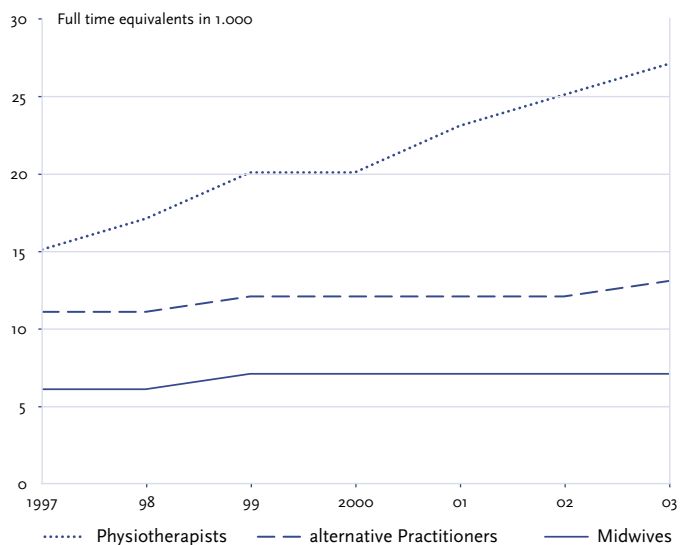


**Figure 4.1.10:** Development of restorative dental surgery (SHI) for dental treatment in the old Federal States 1970 – 2003. Source: German Federal Association of Sick Fund Dentists (KZBV), Year Book 2004

ble dentures has decreased, while the number of single crowns has risen (by 44 percent per SHI member between 1987 and 2003). The number of completed total prosthetic replacements declined by 35 percent between 1987 and 2003 [18].

**Periodontal treatment is gaining in significance.** Systematic periodontal treatment, which is invoiced separately, is on the increase, however. The number of cases in western Germany rose from 557,100 in 1995 to 619,900 in 2003 and in eastern Germany from 101,100 in 2000 to 107,300 in 2003. Periodontal treatments cost the statutory health insurance nationwide €470 million in 2003 [18]. The actual need for treatment may well be far higher than this, since it has been estimated that up to 25 million people in Germany have moderate to severe periodontitis.

Generally speaking, treatment aimed at saving teeth and surgical treatment have increased in importance, while the use of dentures has declined. The principle reason for this change lies in modifications to supplementary payment regulations.



**Figure 4.1.11:** Full time employees (full time equivalents) in thousands for selected professions in ambulatory health care provision. Source: Health Labour Accounts (Federal Statistical Office, IS-GBE) [20]

#### 4.1.6 Other medical professions

**Midwives, alternative practitioners and non-medical therapists mainly provide ambulatory care.** Among those active in ambulatory healthcare are midwives, alternative practitioners and so-called non-medical therapists. These include physiotherapists, speech therapists and occupational therapists. They provide a certain service such as physical or speech therapy, and are SHI-accredited if they have the necessary qualifications and surgery facilities and have signed the declaration on patient healthcare laid down in the German Social Security Code (section 124 of the SGB V). A doctor's referral, however, is required for treatment by a non-medical therapist.

In 2003 199,000 persons were working nationwide in the various other medical professions. 140,000 women, 59,000 men.

**Physiotherapy is being prescribed increasingly often.** The work of the physiotherapist is regulated by the Masseurs and Physiotherapists Act of 26 May 1994. Physiotherapy is primarily used in rehabilitation, but also in sports and in clinical and preventive therapy. It includes diverse activities such as movement and breathing therapy as well as passive methods such as massage, warmth therapy, cold therapy, water therapy and electric therapy. 60,000 physiotherapists, masseurs and balneologists were practising in the ambulatory sector in 2003, 42,000 of them were women, 18,000 men.

It is mainly general practitioners, orthopaedic surgeons and internists who prescribe physiotherapeutic treatment. In 1993 the services of medical gymnasts and physiotherapists cost the SHI system €924 million; this figure had risen to €1.8 billion by 1999.

**Speech therapists work in a variety of facilities.** Speech therapists treat persons with language disorders, speech impediments, voice disorders and dysphagia. Many of them are employed in hospitals, specialist and rehabilitation clinics and hospitals, doctors' and speech therapists' surgeries or in special facilities for children with hearing and speaking disabilities. An increasing number of speech therapists are employed by health departments and special schools for children with hearing disabilities and speech impediments. Qualified speech therapists are also active in training, science and research.

Self-employed speech therapists work in their own individual or joint practices, freelance speech therapists work increasingly often with doctors, physiotherapists, occupational therapists and masseurs in interdisciplinary professional partnerships.

The German Association of Logopaedics has estimated the number of speech therapists in Germany to be about 10,000, 90 percent of whom are women. About a third of the Association's members are self-employed.

**Occupational therapists work to enhance the self-reliance of the sick and disabled.** The main areas in which occupational therapists work are orthopaedics, accident surgery, psychiatry, geriatrics, paediatrics, neurology and psychosomatics. The therapists encourage the self-dependence of the sick and disabled by means of constructive and creative work and exercises taken from everyday life. Independent speech therapy practices play an important part in ambulatory rehabilitation.

According to the German Association of Occupational Therapists, there are between 18,000 and 20,000 occupational therapists working in Germany, about 2000 of them practising in eastern Germany. 85 percent of the Association's members are women, and a sixth of them are self-employed.

**More home births and birthing centres increase the importance of the midwife's role.** According to the Midwife Act of 1985, a midwife is required to be present at every birth. Licensed midwives are free to choose where they work. 18,000 midwives were working in Germany in 2003, two-thirds of them at least partly freelance, according to the German Association of Freelance Midwives. About 2500 to 3000 midwives work exclusively on a freelance basis.

Freelance midwives may assume sole responsibility for looking after women during their pregnancy, birth and postnatal confinement. The increasing popularity of birthing centres, home births and variants between inpatient hospital care and assisted home births have increased the importance of the midwife's role. SHI expenditure on midwifery rose from €88.6 million in 1993 to €213.3 million in 1999.

**Alternative health services are not covered by statutory health insurance in Germany.** Practitioners of alternative medicine are required to obtain authority to practise from their local health authority. The profession is regulated by the Alternative Medicine Act of 1938. The statutory health authority does not cover the services of alternative health practitioners.

There were 14,000 female and 6000 male alternative health practitioners practising in Germany in 2003. According to data from the Association of Private Health Insurance, the total cost of private health insurance coverage for alternative health services amounted to €120.5 million in 2003.

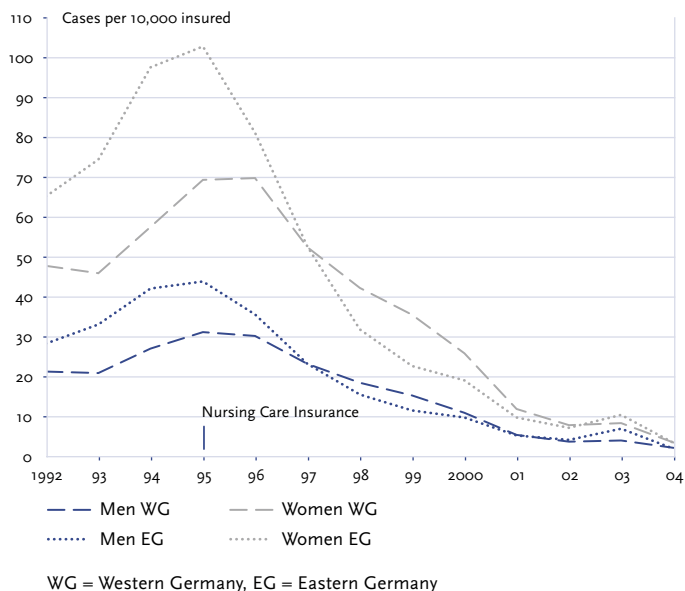
The Federal Statistical Office has been managing the so-called Health Labour Accounts (providing various data on personnel in the health service) since 1997. It provides among other things the figure for non-medical full-time equivalents active in ambulatory healthcare (see Figure 4.1.11).

#### 4.1.7. Small medical device technology and the retail trade

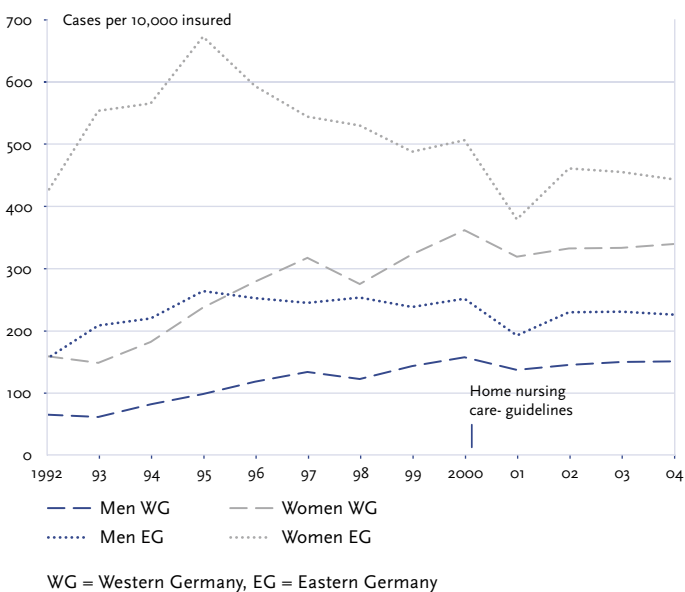
**Domestic and foreign competition has become keener in the field of small medical device technology.** Spectacles, hearing aids, dentures, prosthetic devices and orthopaedic shoes are manufactured by medical device technicians. Small medical device technology is classified under optics, hearing-aid acoustics, orthopaedic shoe technology, orthopaedic technology and dental technology. Part of the costs of the products and services of the producers of small medical devices are met by social security, unlike those of other small commercial manufacturers.

Between 1997 and 2003, the total number of people employed in the field of small medical device technology and health retailing fell from 184,000 to 153,000, 28 percent of whom are women. Over this period, the number of small medical device technicians fell from 61,000 to 59,000. The background to this is a decline in professional medical craftsmanship.

The accelerating pace of technical innovation is leading to the constant improvement of products in every field of small medical device technology. Examples of this are hearing aids and the use of new materials [1]. The demand for accessories can be expected to continue rising due to the growing number of elderly people in Germany, but it is not clear whether this will necessarily result in a favourable turnaround in the market for small medical devices in Germany.



WG = Western Germany, EG = Eastern Germany  
**Figure 4.1.12:** Nursing care at home for the prevention of in-patient stay per 10,000 insured by sex and region. Source: BMG



WG = Western Germany, EG = Eastern Germany  
**Figure 4.1.13:** Safeguarding nursing care per 10,000 insured by sex and region. Source: BMG

#### 4.1.8 Home nursing care

**There are about 10,000 operators of ambulatory nursing-care services in Germany.** Since the introduction of long-term care insurance in 1995, private home nursing-care services have been operating alongside traditional welfare centres providing ambulatory healthcare to people in need. According to nursing-care statistics, there were 10,820 nursing-care services in 1999 accredited pursuant to the German Social Security Code (SGB XI). 8,209 of them were in western Germany, 2,611 in eastern Germany. The figure for 2003 was slightly lower at 10,619 (western Germany: 8,021; eastern Germany: 2,598).

By contrast, the number of employees in the ambulatory nursing-care sector rose from 183,782 in 1999 to 200,897 in 2003. Nurses and geriatric nurses comprise the largest occupational group in these statistics. In 2003 the proportion of women in all occupational groups was about 87 percent. The proportion of women is 78 percent among the more highly qualified people such as social education workers and social workers, who are more likely to be in a senior position in welfare centres and ambulatory care services. The proportion is 61 percent among nursing scientists.

**Home nursing care is possible in cases of temporary sickness.** People with medical insurance can receive home nursing care not only as part of long-term care (see section 1.3.4) but also in the case of temporary sickness. Statutory health insurance is the service provider. A distinction is made between two kinds of home nursing care: hospital-at-home care (section 37 subsection 1 of the SGB V) and preventive domiciliary care (section 37 subsection 2 of the SGB V) [21].

Statutory health insurance covers hospital-at-home care in cases where hospital treatment would have been offered but is not a viable option. It can also be approved if a hospital visit can be shortened or avoided altogether by home care. Reasons for a hospital stay not being viable might be if it is impossible to transport the patient to hospital, or if the patient person is not prepared to undergo hospital treatment, or in exceptional cases, if there is a lack of proper facilities.

Preventive domiciliary care can be prescribed if an ambulatory medical treatment can be carried out and is likely to succeed only if it is supported by home care nursing. Preventive domiciliary care consists mostly of what is known as nursing therapy which, unlike basic care, is a direct part of the therapy (e.g. changing bandages).

##### 4.1.8.1 Hospital-at-home care

**The importance of hospital-at-home care has declined since the introduction of statutory nursing-care insurance.** Hospital-at-home care rose from around 270,000 cases in 1992 to nearly 400,000 cases in 1995 and 1996, after which the number fell sharply to slightly over 18,000 cases in 2004. This sharp decrease is primarily attributable to the reduction in demand caused by the introduction of statutory nursing-care insurance. Hospital-at-home care used to be a common way of compensating for gaps in care provision [21].

The number of cases per 10,000 insured persons was initially appreciably higher in eastern Germany, but then fell even more rapidly (see Figure 4.1.12). This suggests that the variation was the result of differences in the healthcare structure and prescription procedure in the first years following German reunification.

Women avail themselves of hospital-at-home care about twice as often as men, which in principal is due to the fact that women tend to live longer and more often alone than men.

#### **4.1.8.2 Safeguarding home care**

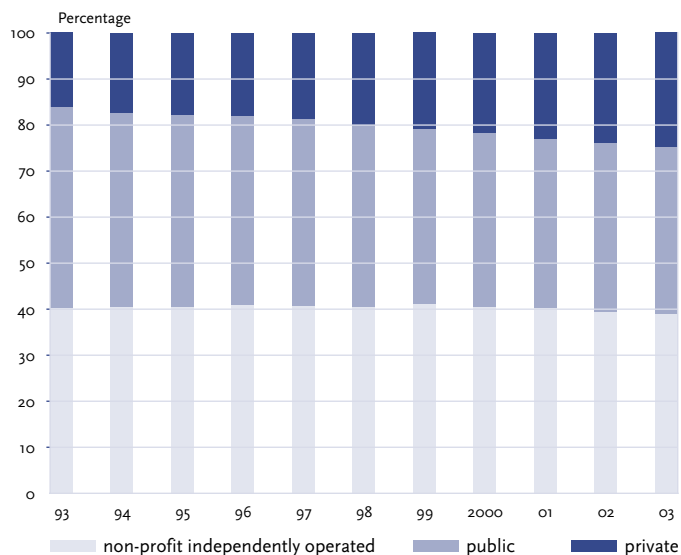
**Ambulatory therapy often has to be supported by nursing care.** A discernible average upward trend in safeguarding home care in support of ambulatory medical treatment continued throughout the 1990s for the country as a whole. The annual figure for the number of cases of treatment increased between 1992 and 2000 from around a million to about two million, later stabilizing at about 1.8 million cases in 2004. There has been an appreciable decline in the number of cases of treatment of women in eastern Germany, however, which has fallen by nearly 30 per cent since 1996.

In contrast to nursing care to avoid hospitalization, the numbers for safeguarding home care have been hardly affected by the introduction of the statutory nursing-care insurance. The main reason for this is that hospital-at-home care principally involves care and treatment that is a direct part of therapy and is therefore not covered by statutory nursing care.

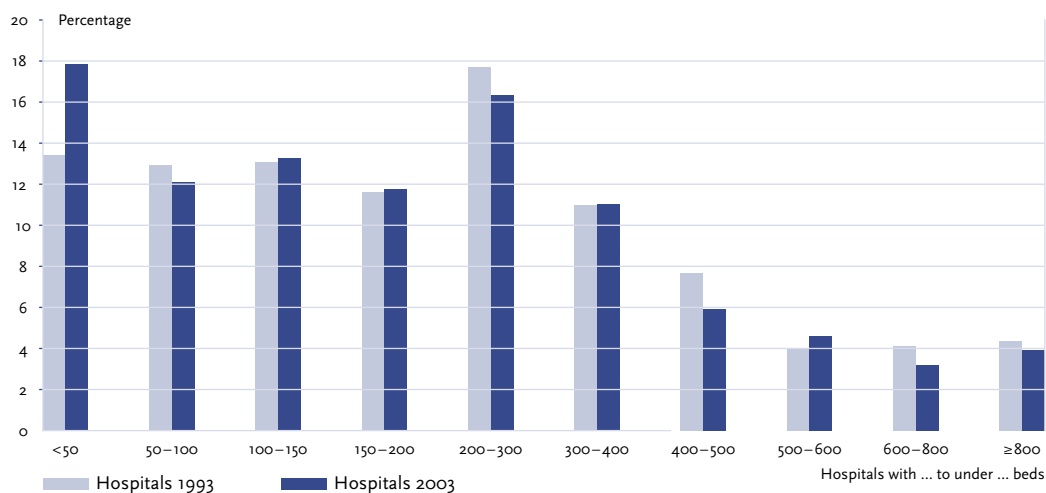
Up to the year 2000 there were no nationwide uniform regulations on ambulatory nursing care. Following the introduction of guidelines to regulate home nursing care in May 2000, there was a fall in the number of quarterly recorded cases of treatment to 1.7 million in 2001 and 1.8 million per annum between 2002 and 2004. This can be explained by the fact that basic care and household help are no longer regarded as autonomous, as they were in the past, but may only be prescribed as part of necessary nursing therapy.

There are about twice as many women as men in preventive domiciliary care and hospital-at-home care.

The number of quarterly recorded cases of treatment per 10,000 insured persons is higher in eastern Germany than in western Germany, but it has been falling there since the mid-1990s and is now approaching the national average. The downward trend in eastern Germany is much sharper among women than men, while the rate of female home-care cases in western Germany has risen since the early 1990s (see Figure 4.1.13).



**Figure 4.2.1:** Hospitals by sponsorship 1993 – 2003.  
Source: Hospital statistics (Federal Statistical Office, IS-GBE)



**Figure 4.2.2:** Hospitals classified by number of beds 1993 and 2003.  
Source: Hospital statistics (Federal Statistical Office, IS-GBE)



## 4.2 Availability and utilisation of inpatient services

### ► Abstract

The number of hospitals in Germany fell by 6.7 percent between 1993 and 2003 to a total of 2,197 at the end of 2003. The decline in the number of hospital beds over the same period (13.8 percent) was even more marked. It was accompanied by a reduction in the average period of hospital stay from 12.5 to 8.9 days, an increased number of cases of treatment, and an rise in the average patient's age. Private hospital providers are playing an increasingly important role in hospital provision in Germany. The principle reason behind these developments lies in the modifications to the general legal framework, which aim to promote the performance-based financing of hospitals. Despite big savings in the field of surgery, the internal medicine and surgery departments still account for over half of all hospital beds in Germany. 1.1 million people (about a quarter of all employees in the German healthcare system) were working in a hospital in 2003. A total of 118,500 fully-licensed doctors and 10,400 who are undergoing practical training work in German clinics and hospitals. The average percentage of women is 35.6, although only 7.2 percent are senior physicians.

The most common main diagnosis among male hospital patients is chronic ischemic heart disease (lack of blood flow and oxygen to the heart muscle). Not counting childbirth, the most common reason for women to be hospitalized is breast cancer.

The number of preventive-care and rehabilitation centres increased up to the mid-1990s, but has been in decline since 1995, as has the number of hospitals.

By contrast, nursing homes are indisputably on the increase. Between 2001 and 2003 alone, their numbers increased by 6.3 percent to a total of 9,743 nursing homes. Meanwhile the number of places in nursing homes rose by 10.5 percent to 713,195 between 1999 and 2003. Only about a third of all those in need of nursing care are actually looked after in nursing homes; two-thirds live at home, supported by relatives or ambulatory care services.

Ambulatory and inpatient healthcare figures, compared internationally, show that it is not only in Germany that the doctor-to-population ratio has increased. It was a phenomenon common to other western industrialized countries in the 1990s and evidence of the improved availability of medical services by doctors. In general, the number of hospital beds and the average duration of hospital stays have declined. Despite the clear downward trends of the 1990s, Germany is still in top position internationally, both in terms of the ratio of hospital beds to the population and the average duration of hospital stays.

### 4.2.1 Hospitals

**The number of hospitals is falling.** At the end of 2003 there were 2,197 hospitals in Germany, 157 fewer than in 1993; an overall decline of 6.7 percent. The trend can be explained by the closure of hospitals without replacements, mergers between two or more hospitals and conversions (for example into rehabilitation clinics or nursing homes).

The background to this development is the new legal framework within which hospitals now have to operate, which is more focused on the element of competition. The 1992 Healthcare Structure Act abolished the principle of so-called retrospective cost coverage in hospital funding, according to which clinics and hospitals that worked economically and efficiently had a right to cost coverage via hospital and nursing charges and public funding. The first part of a reimbursement system was introduced in 2003; under this system hospitals receive a fixed remuneration according to DRGs (diagnosis related groups).

Changes in hospital funding mean changes in the clinical landscape [22]. Between 1993 and 2003, the number of privately funded hospitals in Germany rose from 381 to 545 (or from 16.2 to 24.8 percent of the total number of hospitals in Germany (see Figure 4.2.1).

Figures for public hospitals show a reverse trend. Their number has fallen over the same period by 227 to 796, a decline from 43.5 to 36.2 percent of all hospitals. By contrast, the percentage of independent non-commercial medical establishments has remained reasonably constant: 39 percent in 2003, compared to 40.4 percent in 1993, although the total number of such establishments declined in that period by 94 to 856.

**Small specialist clinics are on the increase.** On the whole, the wave of hospitals undergoing privatization in Germany can be said to have been moderate [23]; even so, it has also had an effect on medium-sized clinics and hospitals, since private clinics and hospitals tend to be smaller than others. In 2003 the average number of beds in privately funded establishments was 99.

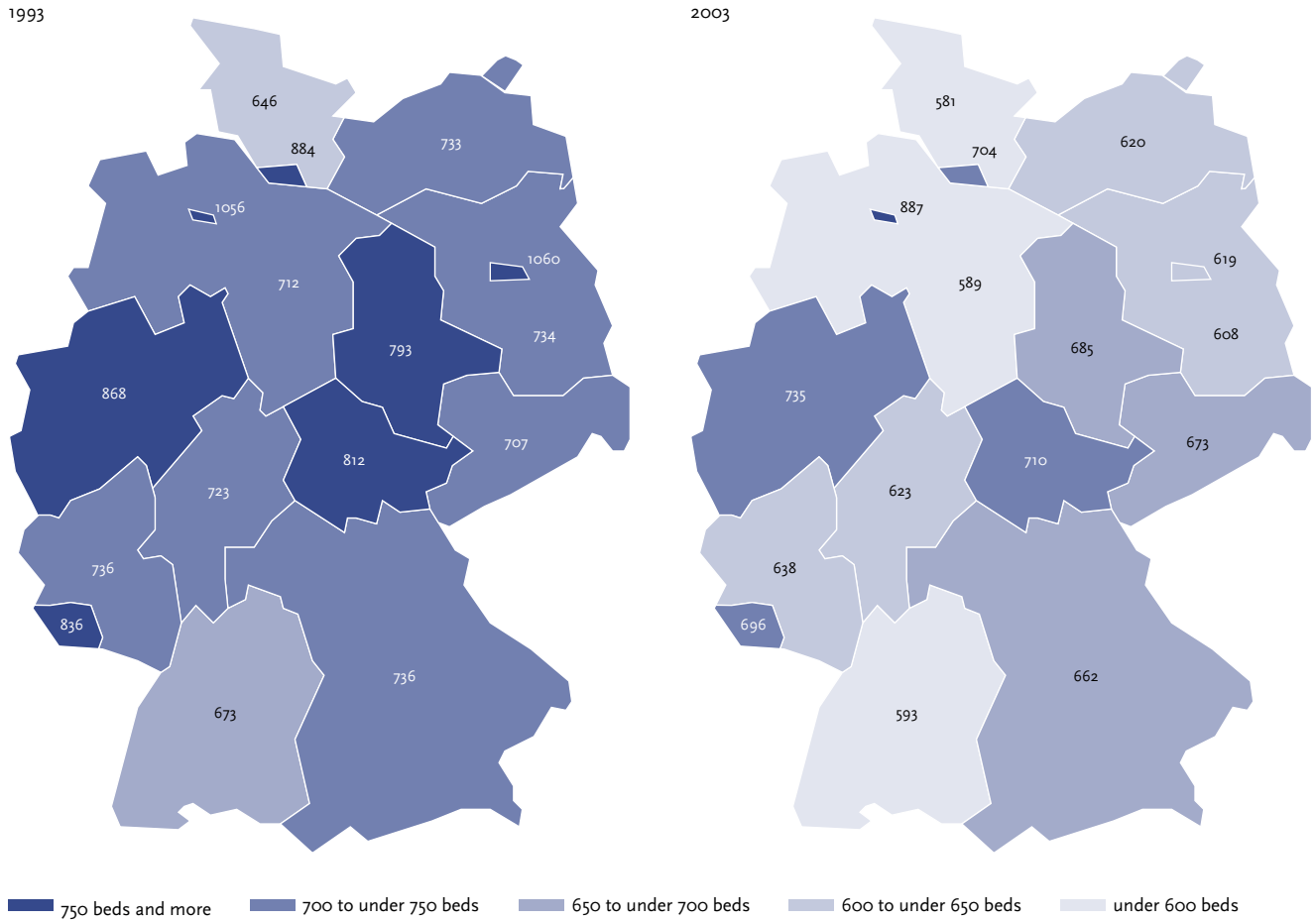
In the course of the last decade alone, the proportion of small clinics with fewer than 50 beds has risen appreciably compared to the total number of clinics and hospitals in Germany (see Figure 4.2.2). This applies especially to specialist clinics, e.g. for plastic surgery. The number of small clinics rose from 316 to 392 between 1993 and 2003.

In 2003 large public hospitals had an average of 365 beds each. Despite the increase in the number of privately funded hospitals, every second bed in 2003 (53.6 percent) was in a public hospital, every third bed (36.4 percent) in an independent non-commercial institution, and only every tenth bed (10 percent) in a private institution.

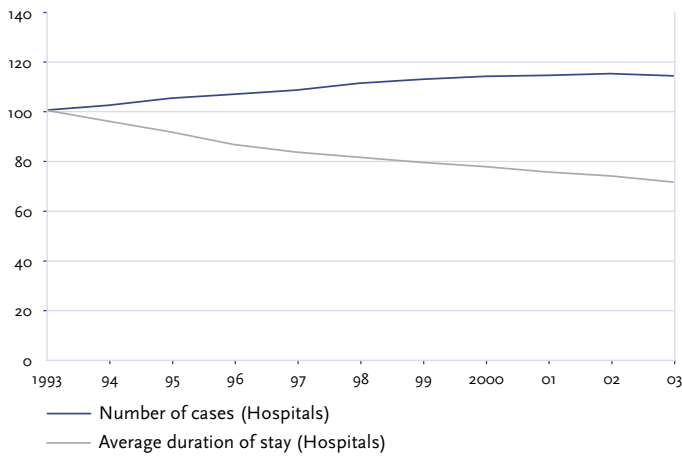
**The number of beds has been reduced by one in seven since the early 1990s.** The reduction in the number of hospital beds, which began in the early 1990s, continued undiminished into 2003, when the total number was 542,000, i.e. 87,000 fewer than in 1993 (a decline of 13.8 percent).

One reason for this reduction is connected to the lower number of patient days, itself the result of changes in the number of patients and the average duration of hospital stays.

Another factor is the modifications in hospital planning drawn up by the individual states in cooperation with the health insurance funds, the German Federal Hospital Society and, where necessary, other organizations. Hospital planning also affects the number of beds available for each specialized medical field.



**Figure 4.2.3:** Beds per 100, 000 inhabitants in the Federal States 1993 and 2003. Source: Hospital statistics (Federal Statistical Office, IS-GBE)



**Figure 4.2.5:** Changes in the number of cases and average duration of stay in hospitals 1993 to 2003 (1993 = 100). Source: Hospital statistics (Federal Statistical Office, IS-GBE)

The ratio of hospital beds to the population in Germany fell from 774 to 657 beds per 100,000 inhabitants between 1993 and 2003, a reduction of 15.2 percent, although there are striking regional variations (see Figure 4.2.3). The cities that are self-contained federal states, i.e. Berlin, Bremen and Hamburg, traditionally have had high bed densities because they draw patients from surrounding areas.

For this reason the currently rather low bed ratio in Berlin is all the more remarkable. Between 1993 and 2003, the number of beds in Berlin decreased by 441 beds per 100,000 inhabitants. Over the same period Hamburg recorded the second steepest decline in the number of beds with a decrease of 180 beds for every 100,000 persons.

**Resisting the trend: plastic surgery is increasing dramatically.** Different specialist units have been affected to varying extents by the general reduction in hospital beds (see Figure 4.2.4). Between 1993 and 2003 a quarter of the total bed reduction (22,000) was related to surgery units, corresponding to a fall of 14.8 percent, while in internal medicine the reduction in beds was only eight percent. 55.5 percent of all available hospital beds were in these two specialist medical fields in 2003.

The sharpest reductions in bed capacity were in paediatric surgery (by 34 percent), ophthalmology (27.5 percent), and gynaecology/obstetrics (27.1 percent).

Resisting the trend, the number of beds has risen over the same period in plastic surgery (+ 63.3 percent), nuclear medicine (+ 50 percent), psychotherapeutic medicine (+ 26.6 percent) and neurosurgery (+ 25.6 percent). These are relatively young disciplines, still in an early phase of development. In 2003 only 2.3 of all hospital beds were occupied by patients undergoing treatment in these medical growth areas.

**One person in four working in the German health system works in a hospital.** At the end of 2003 a total of 1.1 million people were working in the 2,197 German hospitals. This means that about one in four of the 4.21 million employees in the German health system has a job in a hospital. Compared to the previous year the number of hospital staff had fallen by 16,000 or 1.4 percent. In the 1990s, the trend switched from staff growth to staff reduction. Taking the figures for the period between 1993 and 2003 as a whole, there has been a 2.7 percent fall in the workforce.

In 2003 a total of 118,500 fully licensed doctors were working in hospitals in Germany: 42,000 employees (35.6 percent of the total number) were women, an increase of 4.6 percent compared to 1993 (31 percent). A further 10,400 doctors were undergoing practical training in German hospitals in 2003. The medical training stage "doctor-in-practical-training" (first-year resident) was abolished in 2004.

**The number of women among chief physicians is still low.** The proportion of female doctors in German hospitals declines the higher the level in the hierarchy. In 2003 only 7.2 percent of senior consultants were women, which is comparable to the figure in 1993.

25.9 percent of female doctors and 4.7 percent of male doctors worked part-time in 2003 – compared to 11.1 and 1.7 percent respectively in 1993.

In order to take account of the fact that the length of an employee's working month varies according to whether employment is on a full-time, part-time or marginal basis, the number of employees is converted to what the equivalent would be if all were working on a full-time basis, the so-called full-time equivalent. In 2003 there were a total of 824,000 full-time equivalent hospital staff, 10,000 or 1.2 percent down on the previous year.

Hospitals employed an average 375 full-time equivalents, three more than in 1993. Between 1993 and 2003 there was a notable increase in the average number of full-time equivalent doctors in hospitals, from 41 to 52.

The number of cases of treatment fell in 2003 for the first time in years. There were 17.3 million inpatient cases in German hospitals in 2003, a decline of 0.8 percent compared to 2002. This was the first year to record a decline since the early 1990s. When counting inpatient treatments, each new admission of the same patient was counted as a separate case. Same-day discharges (inpatients discharged before midnight on the day of admission) are also included in these figures.

Even more notable was the 4 percent decline in the so-called bed occupancy days in 2003 compared to 1992.

**The duration of hospital stays has been drastically cut over the last ten years.** While the number of cases of treatment rose steadily during the 1990s, the average duration of hospital stays fell significantly (see Figure 4.2.5). The average duration of stay between 1993 and 2003 fell from 12.5 to 8.9 days. One of the main reasons for this was medical and technical progress. Another was the introduction of new financial structures pertaining to hospital care and treatment and the transfer of certain parts of the treatment process to the ambulatory sector.

The reduction in the number of hospital beds by 13.8 percent since 1993 was lower than the reduction in the duration of hospital stays (minus 28.8 percent). Between 1993 and 2003, the average bed occupancy rate fell by 5.5 percent to 77.6 percent.

**Hospital patients are more frequently elderly men than elderly women.** The utilization of hospital services varies with age and sex (see Figure 4.2.6). In 2003 in the 15–50 age group, more women were receiving full inpatient treatment than men, a fact that can be largely accounted for by periods of hospital stays linked to pregnancy and birth. In all other age groups men are more frequent receivers of full inpatient treatment.

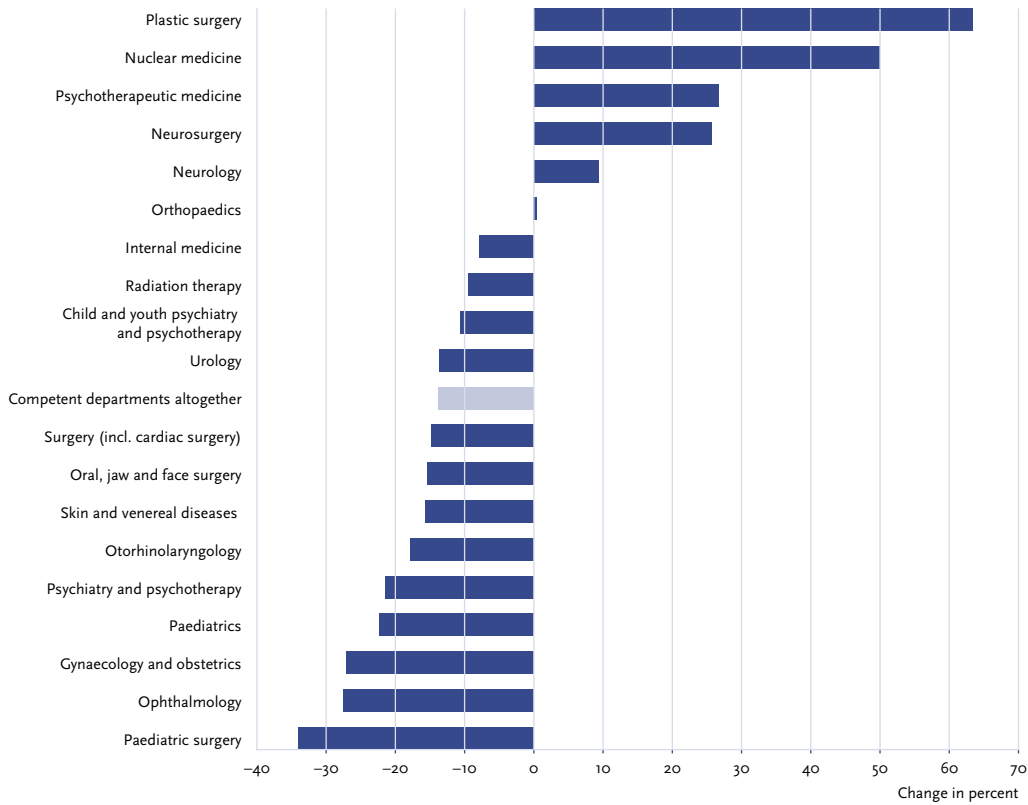
**The average age of hospital patients is rising all the time.** In the last few years there has been a continual rise in the frequency of hospital treatment among over-55-year-olds (see Figure 4.2.7). This trend is particularly marked among the over-75s, where the hospital treatment ratio rose from 44,300 to 55,400 per 100,000 persons between 1994 and 2003, a rise of 25 percent.

The age pattern of hospital patients has altered correspondingly: in 1994, 44.5 percent of the patients were at least 55 years old. In 2003 it was 53.6 percent.

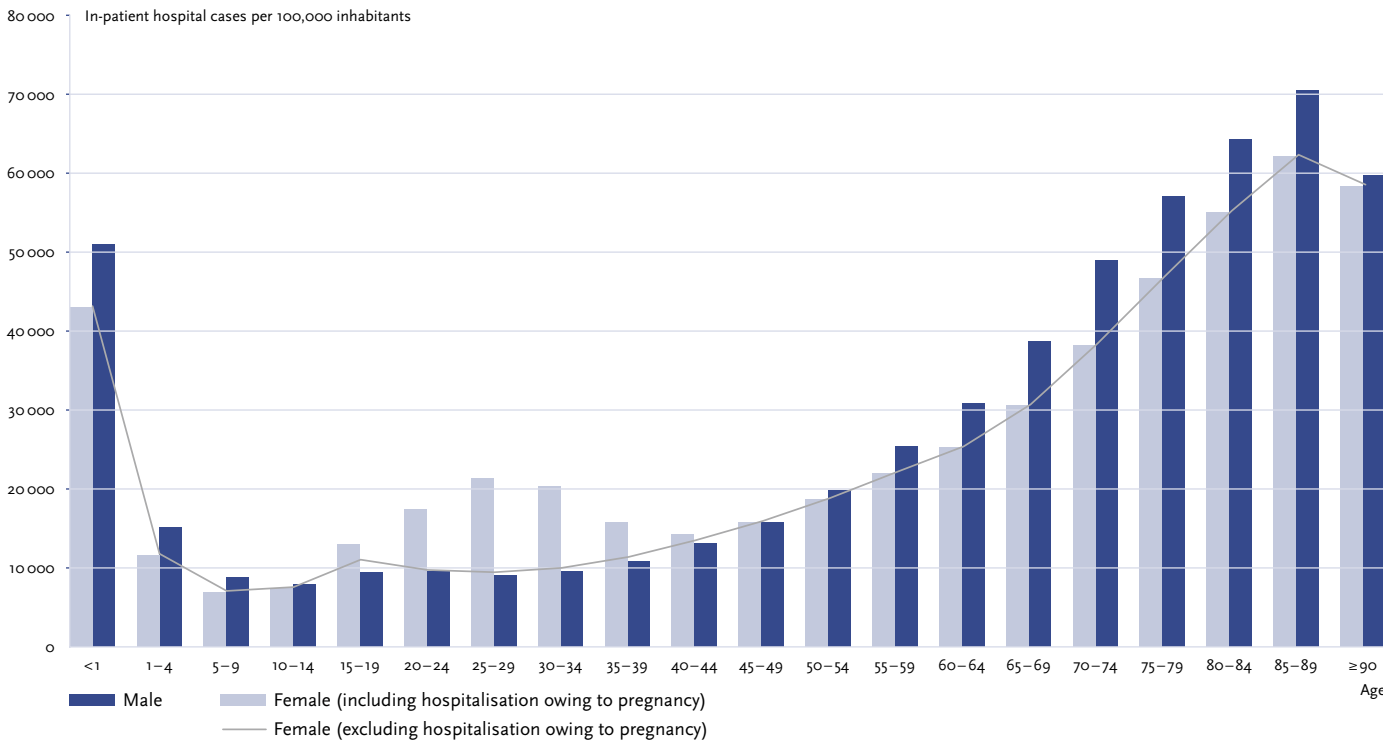
**Little has changed with respect to the frequency of diagnoses.** In 2003 chronic ischemic heart disease, an inadequate supply of oxygen to the heart muscle, was the most common main diagnosis (355,264 cases) made in German clinics and hospitals, affecting 2.1 percent of all hospital patients, 70 percent of whom were men.

Apart from 169,000 normal births, the most common main diagnosis for women was mammary gland cancer. This diagnosis accounted for a total of 156,000 cases of treatment in 2003.

Since 1994 there has been relatively little change in the frequency ranking of the most common main diagnoses of hospital patients. Vascular diseases rank first. They initially constituted 15.4 percent of all main diagnoses, subsequently rising, but then decreasing again to 15.9 percent in 2003. Cancer diseases rank second with a proportion of main diagnoses varying between 11.1 and 12.2 percent. Between 1994 and 2000 injuries, poisonings and certain other consequences of external events (all accidents, for example, belong to this diagnosis cat-



**Figure 4.2.4:** Changes in the number of beds according to specialist unit from 1993 to 2003. Source: Hospital statistics (Federal Statistical Office, IS-GBE)



**Figure 4.2.6:** Age structure of hospital in-patients 2003 by sex (including deceased patients and day cases) – age specific rate per 100,000 inhabitants. Source: Hospital statistics, diagnoses data (Federal Statistical Office, IS-GBE) [24]

egory) ranked third, a position subsequently taken by digestive disorders.

**The most common diagnoses among young adults are deliveries, alcohol poisoning and injuries.** Whether illnesses warrant staying in hospital depends to some extent on age. Among children and young people under the age of 15, respiratory diseases were the cause of the largest number of hospital treatments in 2003 (285,000, or one in five patients in this age group, of which 129,000 cases were chronic diseases of the palatine and pharyngeal tonsils).

In 2003 the most common reason why women between the ages of 15 and 44 were in hospital was normal childbirth (169,000 cases). The second most common individual diagnosis (82,000 cases) was perineal laceration at birth. By contrast, the majority of men in the same age group (114,000) received inpatient hospital treatment because of alcohol-induced psychological or behavioural disorders. The second most common reason for men in this age group to be hospitalized was intracranial injury, with 45,000 treatment cases.

**Cardiovascular complaints are the most common in advanced years.** Cardiovascular diseases are the most frequent reason for treatment in the higher age groups. In 2003 more than one in five hospital patients over 45 years of age was being treated for a cardiovascular disease. In the 45–65 age group it was above all male patients who suffered from this kind of complaint, with 101,670 cases of chronic ischemic heart disease. However, according to the statistics breast cancer was the most common reason for female patients in this age group to be hospitalized (77,243 cases). Chronic ischemic heart disease was the most common reason why male patients between the ages of 65 and 85 were in hospital (133,197 cases), while among female patients in the same age group it was cataracts (clouding of the lens) with 94,823 cases.

For people over 85 there is no difference between men and women in terms of the frequency of different diagnoses. In 2003 the most common reason why men and women were admitted to hospital as inpatients was heart failure (cardiac insufficiency).

**Patients in Brandenburg and Rhineland-Palatinate often undergo treatment in another state.** A number of patients are treated in hospitals that are not in their state of residence (see Figure 4.2.8). In 2003 people from North Rhine-Westphalia were most likely to have treatment in the state where they lived, with 97 percent of patients being treated in their home state. NRW was followed by Bavaria (96.9 percent), Berlin (96.1) and Saxony (96.0). Those most likely to have treatment in a state other than their state of residence are people from Brandenburg (16.4 percent went to a hospital in another state, most of them, 11.9 percent, choosing Berlin).

14.7 percent of patients from Rhineland-Palatinate have treatment in a different state, 4.2 percent of them choosing Baden-Württemberg and 4.1 percent North Rhine-Westphalia.

**Treatment rates vary from state to state.** 256,000 patients from Saarland were given full inpatient treatment in a German hospital in 2003. This constituted 24,110 persons per 100,000 inhabitants, a higher rate than in any other German state. By contrast, only 18,083 per 100,000 inhabitants in Baden-Würt-

temberg had to be treated in hospital, a figure that is well below the national average of 20,897 per 100,000 inhabitants.

Rates of treatment in the various states are influenced by sex and age distribution. Taking such structural differences into account, the number of cases per 100,000 inhabitants is highest in Saxony-Anhalt and lowest in Hamburg (see Figure 4.2.9).

**The nationwide differences in length of hospital stays are continuing to narrow.** The average duration of hospital stays has fallen over recent years, and by and large the variations between individual federal states are decreasing. In 1994 the average duration of a hospital stay varied between 10.4 days in Schleswig-Holstein and 17.7 days in Berlin. In 2003 the lowest average stay was eight days in Mecklenburg-Western Pomerania compared to the highest average of 9.5 days in Saxony. The biggest change was for Berlin (down by 8.7 days), followed by Bremen (down 3.8).

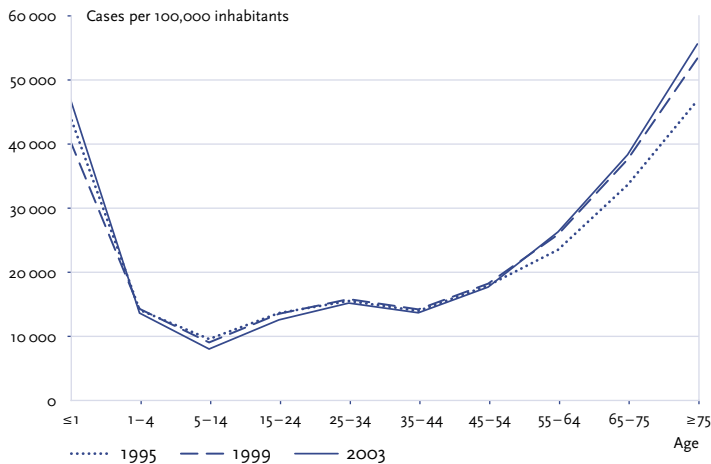
The total number of cases of treatment or days of treatment is decisive in hospital planning. As is to be expected, the large federal states have the highest number of hospital stays. The five largest states accounted for three-thirds of all hospital patients in Germany in 2003: 4.1 million in North Rhine-Westphalia, 2.7 million in Bavaria, 2.0 million in Baden Württemberg, 1.5 million in Lower Saxony and 1.2 million in Hesse.

#### Note on methodology

The allocation of individual diagnoses to certain diagnosis-related groups has been partly modified, owing to the change from the ninth to the

tenth version of the International Classification of Diseases (ICD-9 to ICD-10). For this reason, the basis of sickness-related comparisons of the duration of hospital stays is restricted to

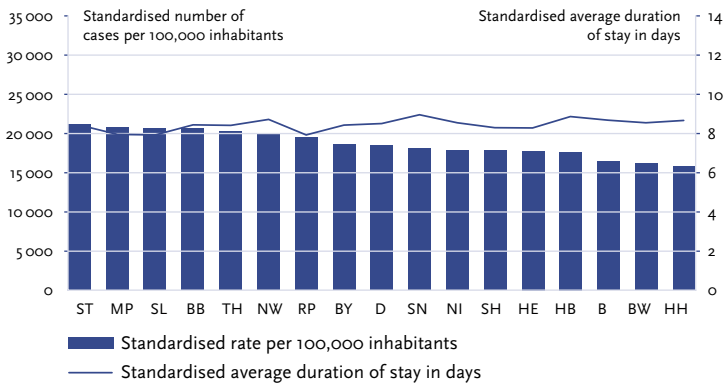
a so-called European Short List, which presents about 70 selected diseases with their various ICD versions (see also section 1.4.2).



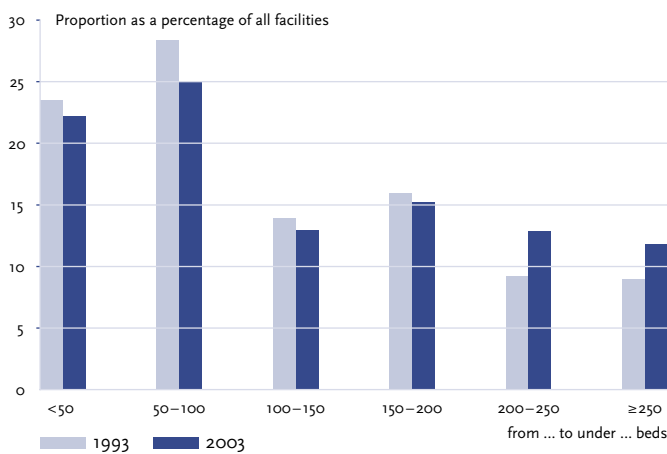
**Figure 4.2.7:** Age structure of hospital patients 1995 to 2003 (including deceased patients and day cases) – age specific rate per 100,000 inhabitants. Source: Hospital statistics, diagnosis data (Federal Statistical Office, IS-GBE) [24]

Federal State	Patient's federal state of residence							
	Baden-Wuerttemberg	Bavaria	Berlin	Brandenburg	Bremen	Hamburg	Hesse	Mecklenburg-Western Pomerania
Germany	1,931,018	2,611,526	627,928	585,021	135,424	316,645	1,230,682	389,074
Baden-Wuerttemberg	1,843,593	44,061	1,105	511	238	511	30,851	252
Bavaria	49,653	2,529,546	2,462	1,071	356	942	19,240	437
Berlin	1,271	1,421	603,642	69,629	181	540	1,116	3,035
Brandenburg	389	478	10,098	489,110	43	195	286	2,813
Bremen	139	160	113	52	123,589	224	144	109
Hamburg	594	714	498	303	912	285,240	757	2,491
Hesse	8,333	15,478	769	377	241	516	1,114,090	197
Mecklenburg-W. Pomerania	531	497	1,951	7,666	118	951	459	368,913
Lower Saxony	1,749	1,831	1,585	817	7,831	4,530	11,729	1,727
North Rhine-Westphalia	4,569	4,077	1,873	745	999	1,320	16,539	535
Rhineland-Palatinate	16,078	1,874	473	193	86	259	30,007	120
Saarland	721	296	76	37	12	31	568	17
Saxony	1,132	3,455	900	9,924	57	231	821	411
Saxony-Anhalt	486	780	801	3,390	70	150	458	478
Schleswig-Holstein	1,047	957	1,140	469	647	20,912	1,207	7,236
Thuringia	733	5,901	442	727	44	93	2,410	303
	Lower Saxony	North Rhine-Westphalia	Rhineland-Palatinate	Saarland	Saxony	Saxony-Anhalt	Schleswig-Holstein	Thuringia
Germany	1,613,170	4,036,100	891,034	256,307	899,451	599,476	577,375	544,085
Baden-Wuerttemberg	2,690	7,755	37,170	1,724	1,558	644	702	933
Bavaria	4,384	11,626	4,389	849	5,394	1,439	1,284	9,661
Berlin	2,980	2,641	482	131	2,880	2,783	847	946
Brandenburg	677	820	132	23	5,333	6,087	293	446
Bremen	66,576	798	68	12	48	67	300	48
Hamburg	32,135	2,721	294	40	223	413	66,393	137
Hesse	8,745	20,442	25,430	707	1,007	644	752	5,780
Mecklenburg-W. Pomerania	2,608	1,426	209	171	1,267	1,159	6,260	507
Lower Saxony	1,423,340	47,737	940	175	741	6,792	3,978	5,463
North Rhine-Westphalia	47,611	3,915,032	36,526	688	1,360	1,138	1,815	941
Rhineland-Palatinate	1,241	16,411	759,820	13,919	488	259	385	377
Saarland	168	689	24,271	237,667	96	54	44	47
Saxony	999	1,434	328	54	863,445	11,869	243	9,796
Saxony-Anhalt	7,367	1,055	197	18	4,999	552,205	252	5,981
Schleswig-Holstein	9,354	4,522	459	91	349	369	493,703	254
Thuringia	2,295	991	319	38	10,263	13,554	124	502,768

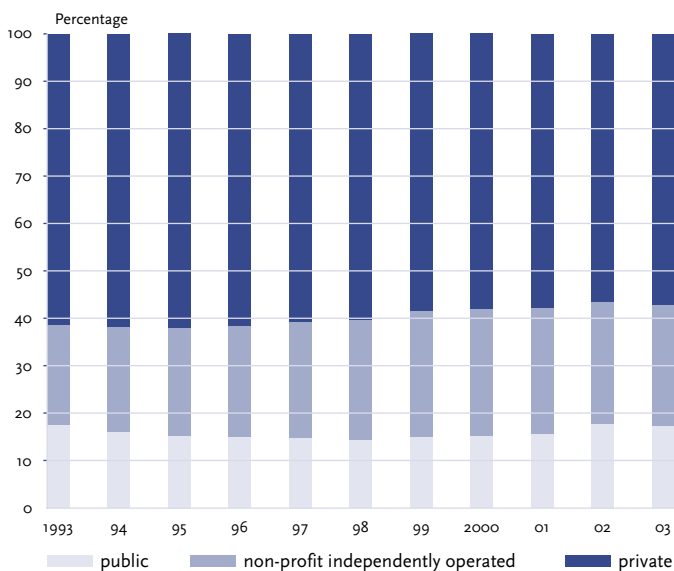
**Table 4.2.8:** Total number of patients seeking treatment in federal states where they are not resident 2003. Source: Hospital statistics, Diagnoses data (Federal Statistical Office, IS-GBE) [24]



**Figure 4.2.9:** Standardised number of cases per 100,000 inhabitants (including deceased patients and day cases) and average duration of stay in hospitals 2003 by Federal States. Source: Hospital statistics, diagnosis data (Federal Statistical Office, IS-GBE) [24]



**Figure 4.2.10:** Preventive care and rehabilitation facilities classified by number of beds 1993 and 2003. Source: Hospital statistics, basic data (Federal Statistical Office, IS-GBE) [24]



**Figure 4.2.11:** Preventive care or rehabilitation facilities classified according to sponsorship 1993 – 2003. Source: Hospital statistics, basic data (Federal Statistical Office, IS-GBE) [24]

#### 4.2.2 Preventive-care and rehabilitation centres

**The number of small rehabilitation centres is declining; large centres are on the increase.** At the end of 2003 there were 1,316 preventive-care and rehabilitation centres in Germany. After their number peaked with a total of 1,404 in 1996, it has been in continuous decline. This situation is comparable to that of clinics and hospitals, where closures and mergers are producing a similar trend. In contrast to hospitals, however, the number of large preventive-care and rehabilitation centres (those with 200 beds and more) has risen appreciably: 97 new centres in this category came into existence between 1993 and 2003, an increase of 42.7 percent. Small and medium-sized centres were in decline during this period (see Figure 4.2.10).

Most preventive-care and rehabilitation centres (57 percent) were privately sponsored in 2003, although the proportion of private centres has fallen constantly since 1993. Public establishments constituted 17.4 percent of the total in 2003, showing no change from 1993. The independent non-commercial preventive-care and rehabilitation centres gained in importance during this period, increasing their share of the total from 21.1 to 25.6 percent (see Figure 4.2.11).

**Bed capacity has not decreased to the same extent as it has for hospitals.** The number of beds in preventive-care and rehabilitation centres had increased to 191,000 by 1998. However, it has fallen constantly since then and there were 180,000 beds in 2003. The bed ratio in 2003 was still 26 higher than in 1993 at 218 beds per 100,000 inhabitants.

This development, which has been marked by a relatively late and less dramatic reduction in beds compared to hospitals, has been affected by two contradictory factors. On the one hand, the Growth and Employment Promotion Act and the Health Insurance Contribution Relief Act (both of which became law in 1996) led to a reduction in available services. Additional payment contributions were raised, transition allowances cut, the gap between two periods of rehabilitation widened, the rehabilitation period limited to three weeks, and the number of people entitled to such benefits significantly reduced. At the same time, however, preventive care and rehabilitation have gained in status and importance due to the demographic shift and further developments in the structure of healthcare management.

**Rehabilitation beds in Germany tend to be located on the North Sea and Baltic Sea coasts.** In contrast to hospitals, preventive-healthcare and rehabilitation services in the three cities in Germany that are self-contained federal states are not healthcare providers for patients from surrounding states. This part is mostly played by the states adjoining the North Sea and the Baltic Sea, a role whose origins can be traced back to a long tradition of health resorts and spas along the German coast. Mecklenburg-Western Pomerania had the highest bed ratio in 1993 with 621 beds per 100,000 inhabitants, with Schleswig-Holstein in second place with 397 beds. By contrast, the city-states (Berlin, Bremen and Hamburg) together only had four preventive-health or rehabilitation centres, providing a total of just under 400 beds and representing a bed ratio of 7 to 100,000 inhabitants.

The range of provisions offered by preventive-care and rehabilitation centres is, by definition, different from that provided by a hospital. Internal medicine, orthopaedics, psychiatry and neurology play an important role in preventive care and rehabilitation. In 2003, 27.5 percent of all beds were allocated to internal medicine, another 25.8 percent to orthopaedics, 8.7 percent to neurology, 7.4 percent to psychotherapeutic medicine and



**Figure 4.2.12:** Changes in the number of cases and the average Average length of stay in preventive care and rehabilitation facilities 1993 – 2003 (1993=100). Source: Hospital statistics, basic data (Federal Statistical Office, IS-GBE) [24]

7.1 percent to psychiatry and physiotherapy. Between 1993 and 2003, the number of beds more than doubled in the neurology sector, but orthopaedics and psychiatry also increased their bed capacity appreciably over the same period.

**Staff numbers have risen noticeably in the last ten years.**

116,000 people were employed in 1,316 preventive-care and rehabilitation centres at the end of 2003, 2.5 percent fewer than in 2002, but 19.4 percent more than in 1993.

The professional services of a doctor play a smaller role in preventive-care and rehabilitation centres than in hospitals. In 2003 a total of 9000 people or 7.8 percent of all staff were working as doctors. The share of women here (44.2 percent) was appreciably higher than in clinics and hospitals, where the figure was 35.6 percent.

In 2003 one in four of the salaried female rehabilitation doctors (27.1 percent) were working on a part-time contractual basis. This proportion is similar to that in the hospital sector, although the 67.8 percent of women active in all part-time medical work is somewhat lower than the percentage in clinics and hospitals.

The higher the level in the hierarchy in preventive-care and rehabilitation centres, the lower the ratio of women to men. Despite this, women are more likely to reach top positions here than they are in hospitals. For example, 17.8 percent of all senior doctors and 56.5 percent of professional assistant doctors were women.

The employment figure in 2003 corresponded to about 96,500 full-time equivalents, 2.4 percent below the previous year. Each preventive-care or rehabilitation centre employed a full-time staff of 73 on average, about a fifth of the average hospital workforce. In 1993 an average of 68 full-time staff were added to each preventive-care or rehabilitation centre. Unlike the hospital sector, the personnel increase in this sector was in non-medical services.

**New laws and a weak labour market have led to lower treatment figures.**

In 2003 a total of 1.9 million patients underwent inpatient treatment in German preventive-care and rehabilitation centres. This figure was 6.9 percent down on the previous year, appreciably more than the decline in the clinical sector over the same period. One of the reasons for this decline was the reduction in applications for rehabilitation courses due to the poor situation of the German labour market. The number of cases of treatment in preventive-care and rehabilitation centres had already fallen by 2.7 percent in 2002 compared to 2001.

Looking at the overall period from 1993 to 2003, it is clear that the Growth and Employment Promotion Act and the Health Insurance Contribution Relief Act led to a significant reduction in the number of cases of treatment in 1997. Between 1997 and 2001, however, a constant rise in the number of cases could be observed (see Figure 4.2.12).

Since the duration of preventive-care or rehabilitation courses is laid down in advance, there is little room for manoeuvre to shorten the average duration of stays. In 1993 a patient spent an average of 31 days in a preventive-care or rehabilitation institution; in 2003 it was down to 26 days, a reduction of 16.2 percent. In 2003, in contrast to the trend in the hospital sector, the average duration of stays rose by 0.4 days and was 1.6 percent up on 2002.

The utilization of preventive-care and rehabilitation services is related to what each state is able to offer. In 2003 Mecklen-

**Data basis**

Data on the number and use of nursing homes have been collected in the nursing-care statis-

tics since 1999. They are updated every two years, so that the following presentation draws on three survey years. In contrast to hospital

statistics, the deadline for completing the statistical survey is not December 31 but December 15 of the respective year.



burg-Western Pomerania and Schleswig-Holstein had the highest number of cases with 6,434 and 4,805 cases of treatment respectively per 100,000 inhabitants. The number was lowest in cities that are self-contained states (together an average of 58 cases of treatment per 100,000 inhabitants) and in North Rhine-Westphalia (1,247 per 100,000).

#### 4.2.3 Nursing homes

**The number of nursing homes is rising.** By the end of 2003 there were 9,743 nursing homes in Germany, an increase of 578 establishments or 6.3 percent over 2001. This development reflects the growing need for nursing care in the wake of the rising numbers of elderly citizens.

Old people, the chronically sick and the severely mentally and physically disabled are nursed and looked after in approved nursing homes. The Nursing Homes Act, which lays down the legal requirements for establishing and operating a nursing home, applies not only to approved nursing homes but also to other kinds of nursing-care establishments, including old peoples' homes, retirement residences and residences for the disabled. In practice, the strict distinction between old peoples' homes, retirement residences and residences for the disabled is no longer maintained. It is not uncommon in inpatient senior citizens' care establishments to house a combination of traditional kinds of home (e.g. a retirement home with a nursing-care section) under one roof according to the maxim, «nursing care is available where you live». The aim of the Nursing Homes Act is to ensure the dignity, protect the interests and respond to the needs of the residents of care homes, to ensure they are involved, and to guarantee standards of living and care that conform with what can be expected on the basis of currently recognized levels of professional knowledge.

In 2003 there were 5,405 independent establishments; more than half of all nursing homes (55.6 percent) were privately sponsored, about one percent fewer than in 1999. The proportion of public nursing homes also fell by one percent to 7.5 percent, while private homes increased in number over the same period, their share of the total number of establishments rising from 34.9 percent in 1999 to 37.1 percent in 2003.

**The trend is moving towards single rooms.** The number of nursing-care places in Germany rose by 10.5 percent between 1999 and 2003 to a total of 713,195, of which 695,000 were for inpatient care. The allocation of beds has clearly changed in favour of smaller rooms. The number of nursing-home places in rooms with four or more beds fell by 67.1 percent. Only 0.3 percent of nursing-home places were in rooms of this size in 2003. On the other hand, the number of single-room places in nursing homes rose by 21.3 percent. By 2003 every second bed in the nursing-care sector was in a single room.

A total of 510,900 people were working in nursing homes at the end of 2003, 7.5 percent more than in 2001. 216,500 of these people were working full-time, 211,600 part-time, and 49,200 on a marginal part-time basis (maximum monthly earnings regulated by law); 84.9 percent of all employees were women.

The principle activity for about two-thirds of all those employed (67.6 percent) was nursing and looking after residents, and the biggest increase in staff numbers compared to 2001 (9.5 percent) was in this sector. A further 19.3 percent of those employed worked in the catering and household sector.

**Only just under a third of those in need of nursing care are residents of a nursing home.** At the end of 2003 about 2.1 million people were in need of care as defined by the Long-term Care Insurance Act: 68.1 percent were women, 81.4 percent were 65 years of age or older, and 32 percent were 85 or older.

Only 31 percent of those in need of care (640,000) were looked after in nursing homes, while over two-thirds (69 percent or 1.44 million) lived at home. Of these only 987,000 received attendance allowances and were, for the most part, looked after by a relative. In the case of a further 450,000 persons, ambulatory-care services assumed partial or full responsibility for home care (see also section 1.3.4).

The number of people in need of care has risen compared to 2001 by 37,000 (1.8 percent). The increase stems exclusively from the larger number of persons now classified at Care Level I, where there has been an increase of 48,000 persons (4.9 percent). There was a slight decline in the numbers for Care Level II and III of about 8000 persons (1.1 percent) and 300 persons (0.1 percent) respectively.

**Professional care is gradually gaining ground.** Statistical data on nursing care show a trend towards professional care, both in nursing homes and by ambulatory nursing-care services. Between 1999 and 2003 the number of people being looked after by nursing-care services rose by 8.4 percent (35,000 persons), and there was an increase in the number of nursing-home residents of 11.7 percent (67,000 persons). The number of people in need of care who were being looked after at home and were only receiving an attendance allowance fell by 4 percent (41,000 persons). The total number of people cared for at home decreased from 71.6 to 69.2 percent.

In 2003, 64 percent of those being looked after at home were women, while the proportion of women in nursing homes was appreciably higher (78 percent). This can be explained in part by the fact that elderly women are more likely to be living by themselves because they have no spouse to look after them.

**The proportion of persons in care rises rapidly with age.** The average age of nursing-home residents is higher than that of those cared for at home. In 2003 about half (46 percent) of those being looked after in a nursing home were 85 years of age or more. The figure for people of the same age in home care was about 26 percent.

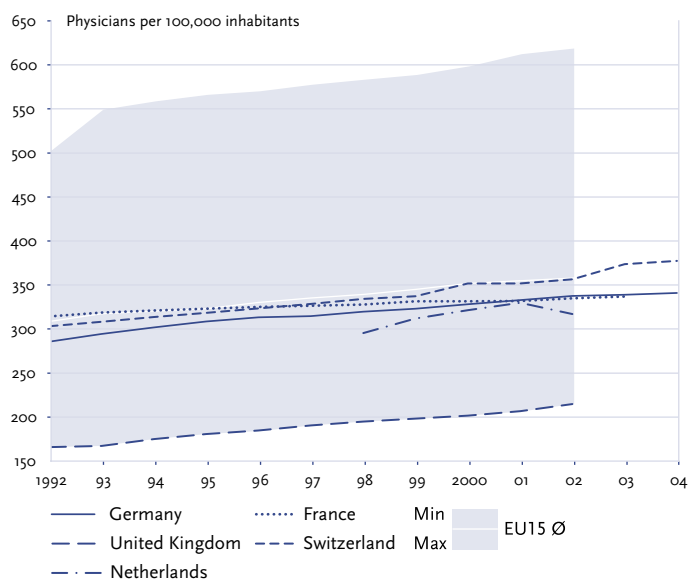
#### Note on methodology

Since healthcare systems vary so much from country to country, international comparisons of ambulatory and inpatient healthcare is only possible to a limited extent. Basic data, such as the doctor or consultant ratio, are only available at an international level with the ambulatory and inpatient sectors listed together, and since it is not possible to differentiate between them, it is mostly trends and not totals that are compared here.

France, the Netherlands, the UK, Switzerland and the USA were chosen for the comparison with the German healthcare system. Switzerland was chosen because of the privatization processes currently taking place there; the Netherlands is of interest because of the innovation potential; the French healthcare system was chosen because it has many similarities to the system here in Germany, and the UK offers the example of a primarily state-run and essentially closed healthcare system, in contrast to

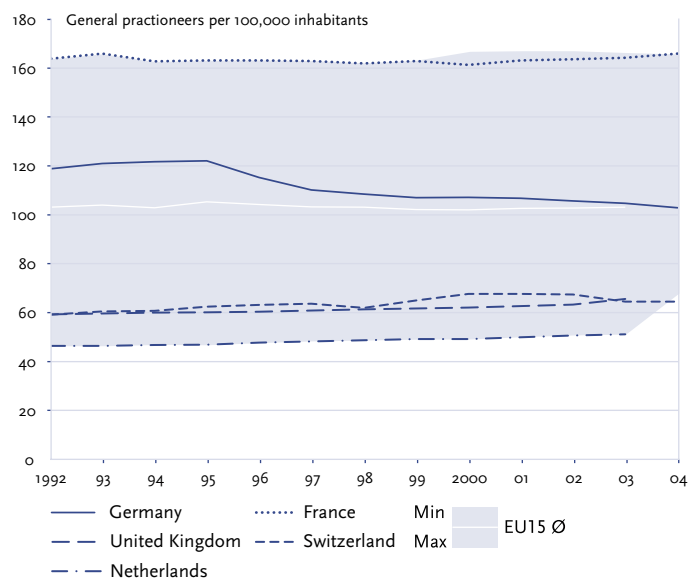
the system in the USA with its predominantly privately funded health service. The respective averages for the EU-15 nations were included in addition to the data from these countries.

The data provided come from the OECD Health Data (Organization for Economic Cooperation and Development) [27] and the European Health for all Database of the World Health Organization [13].



► Comprehensive Information on **nursing care** is to be found in the specialist report of the Federal Health Reporting [25] and the report of the Office of National Statistics: Nursing Care Statistics 2003 – Results for Germany [26].

**Figure 4.2.13:** Physicians per 100,000 inhabitants.  
Source: WHO European Health for all Database, January 2006



**Figure 4.2.14:** General practitioners per 100,000 inhabitants.  
Source: WHO European Health for all Database, January 2006

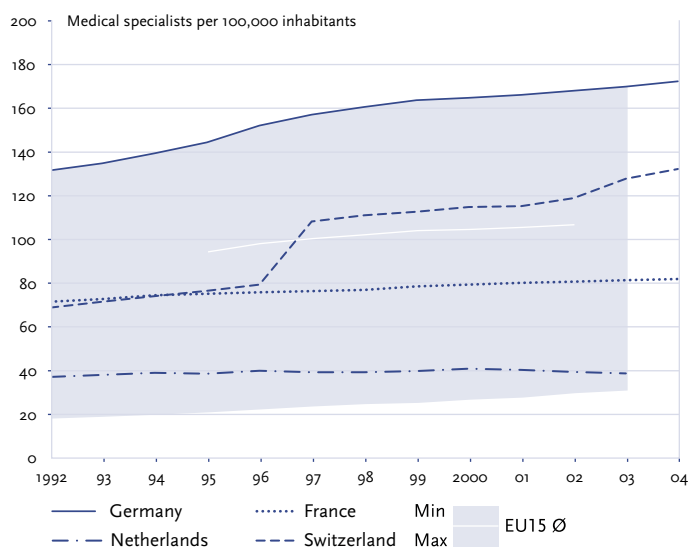


Figure 4.2.15: Medical specialists per 100,000 inhabitants. Source: WHO European Health for all Database, January 2006

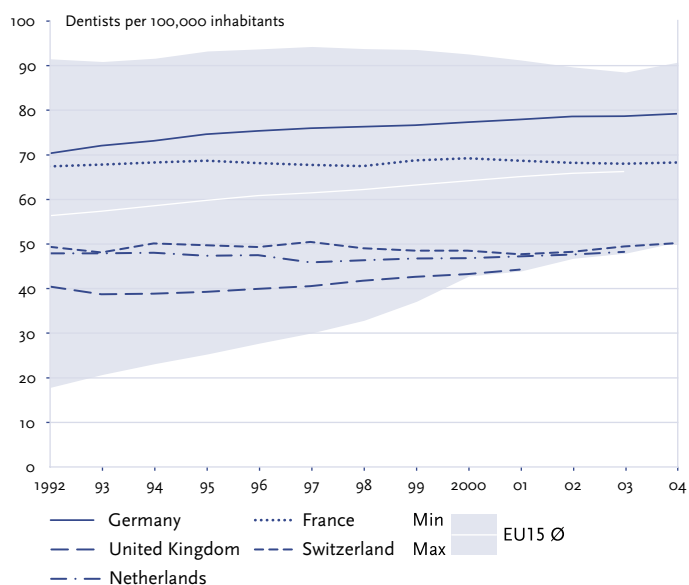


Figure 4.2.16: Dentists per 100,000 inhabitants. Source: WHO European Health for all Database, January 2006

#### 4.2.4 An international comparison of ambulatory and inpatient healthcare

**The ratio of doctors to the population is rising in all countries.** In all the health systems examined here doctors perform (or cause to be performed) the majority of healthcare services. The ratio of the number of doctors and pharmacists to the population as a whole has risen in recent years, but the variations between different countries have remained more or less unchanged.

Germany and France are below the EU-15 average as regards the total number of doctors in ambulatory and inpatient practice per 100,000 inhabitants (see Figure 4.2.13). The Netherlands is also below average, although here data have only been recorded since 1998. The ratio of doctors to the population in the UK is appreciably below the European average, while the figures for Switzerland correspond almost exactly to the EU-15 mean values.

The general ratio of doctors to the population is not in itself sufficient information on which to draw conclusions about basic healthcare structures. In fact the ratio of the amount of ambulatory to inpatient care performed by doctors varies considerably among EU-15 countries, mainly because in some countries hospitals are much more involved in ambulatory healthcare than in others.

**The general practitioner to population ratio in Europe hardly changed at all during the 1990s.** The data providing information on the numbers of GPs, consultants and dentists are drawn from countries that often apply slightly different criteria to the classification of healthcare roles. Bearing this in mind, it is nevertheless evident that the ratio of general practitioners in France is higher than average, while in the Netherlands, the UK and Switzerland the ratio is well below the EU-15 average (see Figure 4.2.14). The GP ratios in Germany have been approximately in line with the EU average since the 1990s. There was no significant change in the GP ratio in any of the countries between 1992 and 2002.

On the other hand, the consultant ratio has risen, both as the EU-15 average and in most of the countries selected for comparison. The rates of change vary considerably from one country to another (see Figure 4.2.15), with Germany far ahead of average in terms of both current levels and the rate of increase. The below-average consultant ratio in France is a reflection of the large numbers of general practitioners there.

**Dentist to population ratio in Germany is higher than average.** As in the case of general practitioners, the dentist ratio in the UK is lower than in the other selected countries (see Figure 4.2.16). The Netherlands and Switzerland were also below the EU-15 mean value, while in Germany and France the ratio of dentists to the general population is higher than average. The average number of dentists in the EU-15 and in Germany and the UK has risen since 1992. This is not the case in France, the Netherlands and Switzerland.

**Pharmacist to population ratio is below the European mean in Germany.** France has the most pharmacies of the countries studied, its ratio per 100,000 inhabitants being well over the EU-15 average. By contrast, the ratio of pharmacies in the Netherlands is relatively low (see Figure 4.2.17).

No Data was prepared by the World Health Organization on the pharmacist ratio in the UK between 1999 and 2002, but comparable OECD figures show that the pharmacist ratio in the UK, as in Germany and Switzerland, is below the European norm.

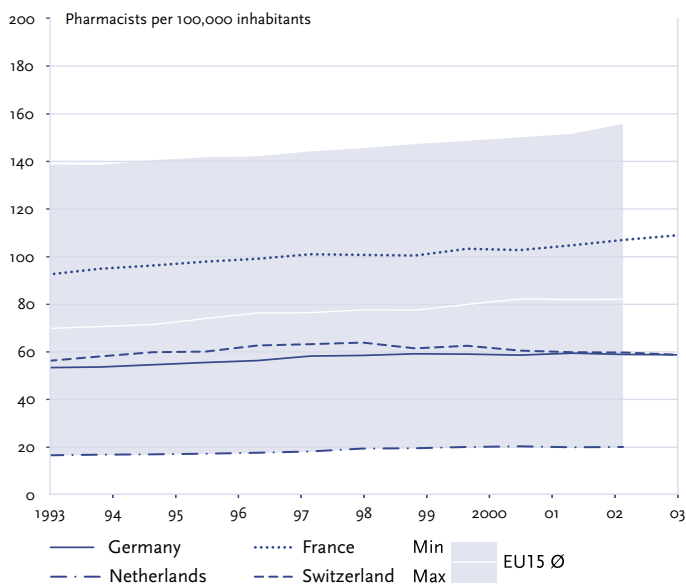


Figure 4.2.17: Pharmacists per 100,000 inhabitants. Source: WHO European Health for all Database, January 2006

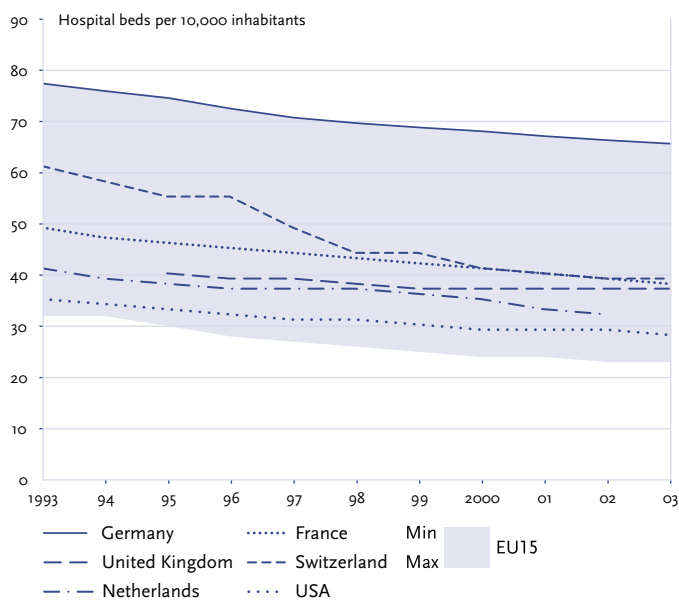


Figure 4.2.18: Hospital beds for acute in-patient treatment per 10,000 inhabitants: an international comparison. Source: OECD Health Data October 2005

The EU-wide overall rise in the doctor and pharmacist ratios since 1992 (on average Germany was in the upper third of countries in this respect) is a reflection of the improvement that has taken place in the availability of healthcare.

**Germany leads the way in terms of the availability of hospital beds.** The fact that the meaning and function of ambulatory and inpatient sectors may vary in different countries makes a decisive difference to the way hospital beds are counted. Thus, international comparisons tends to be problematic. Even allowing for this, it can still be said that the level of inpatient healthcare in Germany is exceptionally high (see Figure 4.2.18). In 2003 bed ratio was 66 beds per 10,000 inhabitants.

In the majority of countries bed ratio declined between 1993 and 2003 at rates varying from 15.2 percent (Germany) to 36.1 percent (Switzerland). On the whole this has led to fewer beds being used more intensively than in the past [28].

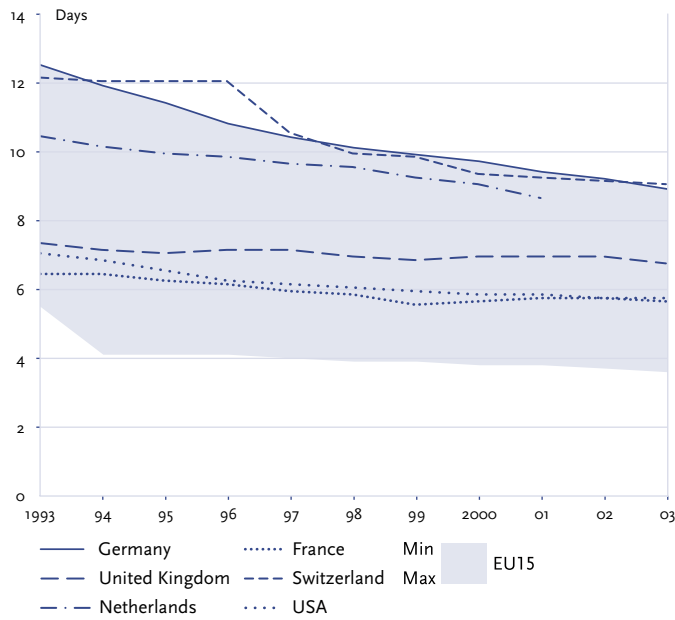
**The periods of time people stay in hospital is still higher in Germany than elsewhere.** The average length of a hospital stay has declined in most countries since the early 1990s (see Figure 4.2.19). This can be explained, perhaps, by less stressful operations and the improved forms of post-inpatient treatment that are available. It was the mid-length periods a hospital stay that shortened the most (by 28.8 percent) between 1993 and 2003 in Germany, so that in 2003 German patients were leaving clinics and hospitals after an average stay of 8.9 days, 3.6 days sooner than before.

Nevertheless, this length of stay is still high by international standards. Only in Switzerland was the average hospital stay (9 days) as long in 2003. Germany's higher-than-average hospitalization period can be explained by several factors. Before the introduction of mandatory nursing-care insurance in 1995 patients were often treated for longer periods in hospital because no appropriate home nursing care was available [29]. The average period of hospitalization was correspondingly high in the early 1990s. The reimbursement system based on the standing hospital day charges, subsequently abolished, tended to mitigate short periods of stay [30].

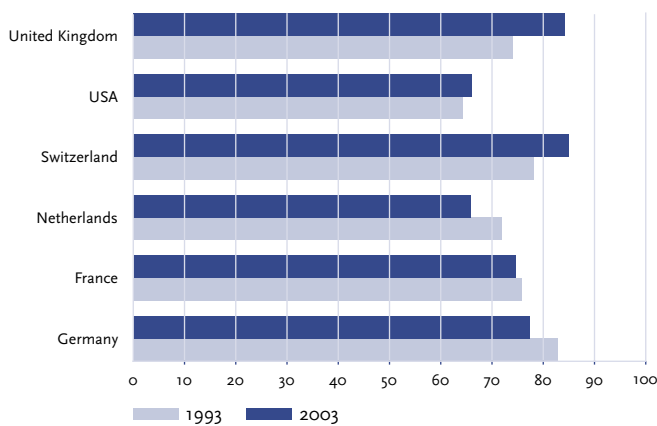
Comparing the various figures, the UK appears to be an exception in the strong trend towards shorter hospital stays. There, the average length of stay in a hospital fell between 1993 and 2003 by a mere half a day to 6.7 days, a fall of only 8.2 percent. France and the USA have the shortest periods of average stay, both with a constant average of just under six days since the late 1990s.

Shorter hospital stays are accompanied by a more concentrated level of attention and service and are liable to incur higher daily costs. If the period of stay is shortened too drastically, the rate of readmissions could increase, thereby leading to higher overall costs of treatment [31].

**The bed occupancy rate in Germany is average.** With a hospital bed occupancy rate of 77.6 percent in 2003, Germany fallen back a little further from the international leaders in this respect (see Figure 4.2.20). Switzerland and the UK have been able to raise their comparatively high bed occupancy rates in the last few years. In the USA (bed occupancy rate: 66.2 percent) and the Netherlands (66 percent in 2001) the bed occupancy rate was comparatively low.



**Figure 4.2.19:** Average duration of stay for acute in-patient treatment: an international comparison. Source: OECD Health Data October 2005



**Figure 4.2.20:** Bed occupancy rate: an international comparison 1993 and 2003. Source: OECD Health Data October 2005

### 4.3 Quality management in the healthcare system

#### ► Abstract

Efforts at quality assurance in the German health system have been stepped up since the 1990s. Various new quality requirements have been enshrined in social law and the medical profession, and hospitals and health insurance funds have started their own quality-assurance initiatives.

Their practitioners are personally responsible for the quality of their services. Supervision of the professional activity of medical practitioners is the responsibility of the medical chambers in the federal states, whose legal obligations and limits are defined by the respective state legislation (Act on Councils for the Medical Professions). The German Medical Association – in its capacity as the federation of state medical associations working on a supra-regional level – has published various programmes for further training and course books (curricula) on structured ongoing and further training in quality assurance and quality management. More than 2500 medical practitioners have completed courses in quality management offered by state medical associations and, whenever possible, taken a supplementary course entitled “Medical Quality Management”.

Clinics, hospitals and doctors’ surgeries are committed to quality assurance and the introduction of an internal quality-management system under the terms of Book V of the German Social Security Code. All accredited hospitals are obliged to take part in external comparisons of certain data on performance and results. In 2004 an estimated 60 percent of German hospitals had already set up their own quality-management system or were in the process of introducing one. Furthermore, various tried and tested certification procedures, some of them international, are becoming more popular. Such procedures frequently involve a structured internal and external assessment of the institution in question.

The German Social Security Code now also obliges rehabilitation centres and nursing-care centres to maintain quality assurance. Nursing-care homes have to permit random spot checks of their premises. Between 1997 and 2002 the Medical Review Board of the Statutory Health Insurers inspected 60 percent of all the nursing homes for the elderly in Germany; one in five of these were subject to repeated inspections due to quality deficiency.

A increasing role is being played by systematically developed guidelines that reflect the current state of knowledge and offer medical practitioners and patients guidance in making decisions about treatment. The Association of Scientific Medical Societies in Germany has published more than 850 guidelines to date.

Since 2005 German clinics and hospitals have been obliged to publish quality reports at two-yearly intervals containing data not only on their quality management but also on their range of care and treatment they offer, the level of staff qualification, the number of patients treated and the nature and number of operations. The reports are available on the Internet and are there to provide information to the general public, office-based doctors and health insurers on the quality attributes of different clinics and hospitals.

In Germany, there are no reliable data on the frequency of medical malpractice in hospitals. However, a growing number of clinics and hospitals have their own voluntary reporting systems, so that mishaps and malpractice in everyday healthcare can be identified and their recurrence prevented.

In recent years, both politicians and the public have increasingly gained the impression that the considerable expenditure on the healthcare system has not improved the overall level of performance and quality to the extent that would have been possible.

In this sense, efforts at quality assurance are becoming less and less a matter of individual elements – such as the standard of training or the quality of technical equipment – but rather are seen to relate to each and every factor directly or indirectly relevant to the service or affecting its quality. In addition to the structural requirements already referred to (structure quality), interest and attention are increasingly focusing on the quality of the organization of procedures and the quality of the treatment process (process quality) as well as the value of the results that have actually (and not theoretically) been achieved (outcome quality) [32, 33]. The prerequisites for further quality improvements can only be created through a structured interaction of all the initiatives and measures that are put in place.

Quality management is involved in a constant, systematic effort to maintain an ever-increasing improvement in quality in all three areas. Its underlying principle is an ongoing and constantly revised process:

- ▶ “Plan” by analysing from your point of departure and drawing up an improvement strategy.
- ▶ “Do” changes designed to solve the problems.
- ▶ “Check” to see whether the changes are working.
- ▶ “Act” to implement successful changes on a broader scale.

This so-called PDCA cycle is intended to ensure that an adaptive system emerges.

#### 4.3.1 Structure, process and outcome quality

**Efforts have been intensifying since the 1990s to improve the quality of the healthcare system.** Efforts to improve the quality of the healthcare system are hardly new. Quality assurance upheld by certificates and references has a long tradition. However, a multitude of additional quality-assurance techniques have recently been developed, including focusing on aspects of process and outcome quality, the introduction of quality-management models, the introduction of quality circles, the quality comparison of equipment, furnishings and fittings, the extension of examinations to include entire organizations, and the trend towards permanent monitoring (for example re-certification) carried out at regular intervals.

Those involved in healthcare are increasingly being called upon to make their service capabilities transparent and to ensure the quality of their services. There is a growing desire on the part of patients to be informed, particularly about the quality performance of the various healthcare institutions.

a range of pilot projects was promoted by the Federal Ministry of Health in the context of a programme called “Quality Assurance” that was in operation until 2006. These included encouraging 50 individual measures in the sector of inpatient care, 30 in the ambulatory sector, eight in nursing care, and nine cross-sector or multi-sector projects. Along with a progress review of quality management in Germany in the early 1990s and the showpiece project “Quality Management in the Hospital” in the late 1990s, now, within the framework of the model

##### Definition

The quality of medical treatment cannot be evaluated as a whole; one has to differentiate between its parts. For this reason, as a general rule, quality aspects are examined individually and the separate results compared. Three particular distinctions are especially important in this respect, namely structural quality, procedural quality and outcome quality.

Structural quality refers to the composition of structural conditions. High structural quality means that the requirements are in place to do something in accordance with prevailing regulations and to do it well. Typical measures to ensure structural quality in medical care are, for instance, training and qualification standards; as well as demanding minimum standards for hospitals, medication and treatment methods. Such demands may be related to the facilities and organizational structures of surgeries and clinics, to their equipment, further training of employees or to their documentation and financial systems.

Procedural quality relates to the functioning of processes. High procedural quality means that the correct measure is accomplished well and at the correct time. In the healthcare system this refers in particular to the quality of treatment and nursing-care processes. High procedural quality works on the assumption that diagnostic and therapeutic measures conform to the recognized rules of medical science and the proven practical experience of medical practitioners. Specialist guidelines are typical tools for the assurance of procedural quality.

A high outcome quality is said to have been reached when the feasible aim of a treatment is actually obtained. Outcome quality is, therefore, the most important measure of evaluating the level of medical performance. It relates to a patient’s state of health, quality of life, condition and behaviour, and professional and social reintegration after the completion of a therapy. Factors for determining the level of medical outcome quality include the extent to which complications and errors in treatment are avoided, whether operations have to be repeated, whether pain is caused, and the number, if any, of incidents of premature death. Patient satisfaction concerning interaction with the practitioner and medical staff as well as the cost effectiveness of a therapy are also aspects of outcome quality.

programme, there are guidelines for quality assurance in hospitals, nursing care and psychiatry. Among other projects promoted were special projects on mammography and the treatment of breast cancer, and procedures in oncology, radiotherapy, neurosurgery and heart surgery, operative gynaecology, dialysis treatment and anaesthesia.

In the meantime, numerous tools for measuring and assuring quality in the German health system have been tried out. Among others they include comparisons of quality indicators between facilities or regions; performance and health registers; concepts of internal quality management; concepts of risk management; appraisals of health facilities with regard to their business excellence, quality of treatment and quality management; peer reviewing (critical evaluation of work by colleagues); orienting therapy towards scientifically proven excellence; the development of guidelines; the re-certification of service providers; quality conferences and quality reports; and further training in quality management.

#### 4.3.2 Occupational and professional quality-management requirements in healthcare

**These work on the basis of regional (state) and national (federal) laws.** The requirements as to personal knowledge and proficiency of members of the healthcare professions are regulated in Germany by the nationally applicable Medical Licensure Act for medical practitioners, dentists and pharmacists; by regulations on the training and examinations of members of the healthcare professions; state legislation on health practitioners; and further-training regulations laid down by the state medical associations. Only people who have met the relevant requirements and are able to prove this by passing a state-recognized examination are permitted by law to practise the profession concerned, or to be active in the relevant specialist field in Germany.

Responsibility for ensuring that persons exercising a medical profession meet accepted quality standards lies with the state medical associations as laid down in the state “chamber laws” and laws on the healthcare professions. As part of professional further training to become a consultant, every medical practitioner is expected to deal with fundamental issues of quality assurance and quality management in medical healthcare. For a medical practitioner it is quite obvious that competence in one’s profession needs to be constantly reinforced and extended by an ongoing process of learning, achieved by taking part in appropriate further training. This applies just as much to specialist knowledge in one’s own field as it does to interdisciplinary knowledge.

**Structured further training is intended to reinforce quality management.** Since this precept was given legal validity, the German Medical Association has compiled various curricula on structured further training in the area of quality assurance/quality management. The curricula deal with the following individual topics: quality assurance/medical quality management (3rd revised edition 2003); structured medical healthcare (1st edition 2003); psychosomatic basic care (2nd revised edition 2001); medical leadership (1st edition 2006); evidence-based medicine (2nd edition 2005). Since the introduction of the curriculum on “Medical Quality Management/Quality Assurance”, over 2500 medical practitioners have completed courses offered by the state medical associations and, wherever possible, taken the supplementary course entitled “Medical Quality Management” as part of the further-training regulations.

In addition to the requirement on further training (a measure which is now a central part of ensuring structure quality), one of a professional doctor’s specific obligations is his or her participation in special measures introduced by the state medical associations to ensure quality in medical practice.

Numerous scientific medical societies are involved in quality assurance in healthcare provision; in some cases they have been doing so since the 1970s. It is the responsibility of each to define for their special area what approaches and what measures could serve to effectively ensure and improve standards in medical practice. At an early stage, the Association of Scientific Medical Societies in Germany (AWMF), a national organization of more than 150 societies, provided the impetus to draw up expert guidelines in specific specialist medical areas. Today the AWMF offers more than 850 guidelines for practical use in the context of medical healthcare.

**The German Social Security Code commits office-based doctors, clinics and hospitals, rehabilitation, and ambulatory and inpatient nursing-care centres to maintaining quality assurance.** Book V of the German Social Security Code (SGB V) lays down the general conditions of quality assurance in the healthcare system for the field of statutory health insurance. The health provider has to ensure that the services provided are in line with state-of-the-art scientific knowledge and are performed in an irreproachable way. In addition, office-based doctors and inpatient healthcare centres are obliged to introduce an internal quality-management system and to take part in comprehensive quality-assurance measures (section 135a of the SGB V).

An additional legal provision stipulates that associations of SHI doctors promote the quality of care provided by SHI-accredited doctors and record the results of related measures – and that the records be published annually. In some individual cases the associations of SHI doctors carry out random inspections to check the quality of care. Since 2004 the Federal Joint Committee (on which the medical body/profession, clinics and hospitals and health insurers are represented, as well as citizens’ and patients’ spokespersons, who have advisory rights and can table motions) has been responsible for drawing up criteria for appraising the quality of healthcare provided by SHI-accredited doctors and to stipulate the nature and scope of random checks (section 136 of the SGB V).

In addition, the Federal Joint Medical Committee appraises new methods of examination and treatment prior to these being added to the schedule of benefits of the statutory health insurers (section 135 of the SGB V). Finally, the Committee defines what is required of quality-assurance measures and internal quality management practised by healthcare centres and lays down criteria on the necessity and quality of diagnostic and therapeutic health provision (section 136a of the SGB V).

Rehabilitation agencies and licensed nursing-care centres are also committed to maintaining quality assurance according to Book V of the German Social Security Code (Statutory Health Insurance), Book IX (Rehabilitation and Participation of Disabled Persons) and Book XI (Statutory Nursing Care Insurance). In the case of inpatient care this responsibility extends beyond ordinary nursing care to include board and lodging. In addition, nursing-care centres must make provision for random inspections to be carried out by experts (see also section 4.3.3. on quality assurance in rehabilitation and nursing care.)

**Doctors must provide evidence of further training.** Since the Social Health Insurance (SHI) Modernization Act became law in 2004, all SHI-accredited doctors are legally obliged to take part in further training on a regular basis and must be able



**Figure 4.3.1:** External comparative quality assurance on the basis of §137 SGB V (Social Security Code) – operation level, participating committees and Institutions as of 2004



to prove they have done so. Relevant guidelines on this have already been published for the ambulatory sector, stipulating that 250 subjects be covered within five years. The Federal Joint Committee lays down the standards for hospital doctors.

**A call for more quality assurance at both European and federal state levels.** In 1996 in Warsaw, at the fifth conference of health ministers from countries represented on the Council of Europe, there was a call for a range of measures called «Social Challenge to Health: Equity and Patients' Rights in the Context of Health Reforms», aimed at improving quality in the healthcare system. Health ministers called for

- ▶ the establishment of quality standards and regular quality appraisals by third parties (health audits), and the introduction of an effective complaint-management system;
- ▶ the restriction of healthcare to effective and efficient measures of a scientifically sound medical practice;
- ▶ a new understanding, a "new deal" so to speak, between patients, providers and cost carriers, as well as an explicit definition and acceptance of the rights of patients, aimed at encouraging patient empowerment in the form of self-determination and responsibility;
- ▶ the democratic participation of patients in the shaping, directing and appraisal of healthcare;
- ▶ the inclusion of the patient's perspective in pre-training, training and further training for healthcare professions.

Various decisions taken in Germany at state level point in the same direction. At the conferences that took place in 1996, 1997 and 1999, state health ministers called for the rationalization of the general legal provisions, universally applicable and scientifically based guidelines and standards, systematic evaluation and health-service research, a guarantee of the fundamental rights of patients and a national quality strategy.

In their united strategy on quality management in healthcare formulated in 1999, the health ministers' conference laid down eleven aims:

- ▶ consistent patient orientation in healthcare;
- ▶ the use of medical guidelines and nursing-care standards for quality development;
- ▶ the trans-sectoral design of quality assurance and quality management;
- ▶ the strengthening of quality management in health-service facilities;
- ▶ the improvement of databases on quality assessment;
- ▶ the documentation of quality in quality reports;
- ▶ the development of quality-oriented management;
- ▶ the creation of further incentives to maintain continual quality improvement;
- ▶ greater support for and facilitation of quality development;
- ▶ more intensive coordination when applying quality targets at the national and regional levels;
- ▶ the strengthening of professionalism in the field of quality assurance and quality management.

Many of these aims have become law or been taken over by contractual partners in the health service system.

The German Medical Assembly, the AGM of the German Medical Association, passes resolutions on fundamental issues of health policy including quality assurance. Various guidelines are then formulated on the basis of these resolutions. According to these guidelines, quality assurance, which has always been an intrinsic responsibility of medical practice, should include all aspects of medical healthcare, exclusively serve the purpose of improving patient healthcare, and not be in any way self-serving. It works on the assumption that reliable data is

available, problem-focused methods are employed, and there is wholehearted and close participation by everyone involved. It is not research; rather it should be seen and understood as an innovative, continuous and interdisciplinary process.

### 4.3.3 Examples of quality management in healthcare

#### ***The constant aim of quality management is to improve quality.***

A simple and popular definition of quality management is that it is a systematic way of ensuring that activities are carried out the way they were planned [34]. This means preventing quality problems from arising in the first place by means of an appropriate approach by the parties involved, and by the use of appropriate methods. This presupposes an analysis of all the factors that may affect quality.

Quality management needs clearly defined targets. These targets must be formulated differently for a hospital, a doctor's surgery, physical therapy or medical gymnastics facilities. Whether the given targets are actually reached can be demonstrated by means of concrete quality-assurance measures (for example the existence of and compliance with a hygiene plan), or by measuring quality indicators.

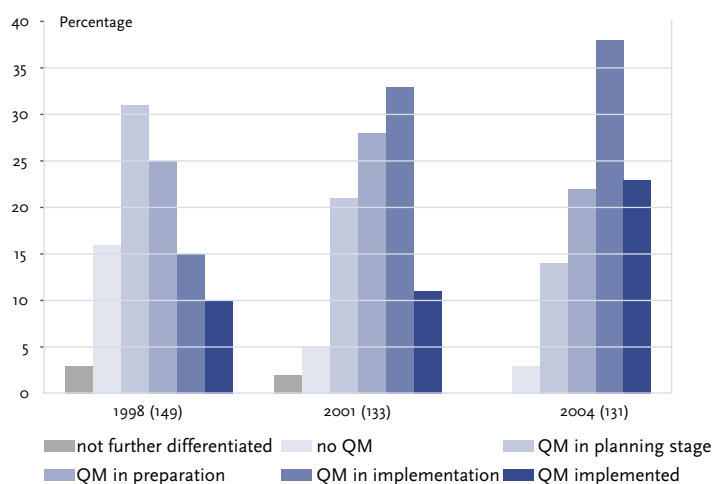
Quality management goes beyond ensuring that the standards of individual processes are met. It involves the procedures and results of entire organizational units. Its aim is a higher level of satisfaction for everyone involved, above all the patients, although staff satisfaction is also extremely important in the health service.

While quality-assurance measures are put in place to consolidate a given level of quality, quality management plans for the future and aims at ongoing and continuous improvements in the level of quality.

**Hospitals are subject to quality comparisons laid down by law.** Apart from some early efforts to achieve transparency in the treatment of sickness, resulting for example in the Munich Perinatal Study of 1975 or the Surgery Quality Assurance Study of 1977, matters of quality transparency, quality competition, as well as the management perspective have only been the focus of discussions on quality since the 1990s.

The introduction of so-called "external" quality assurance under the terms of the Healthcare Reform Act of 1989 was of particular importance in ensuring the quality of inpatient treatment. Since this Act became law, clinics, hospitals, preventive care and rehabilitation centres accredited in accordance with Book V of the German Social Security Code (section 108 of the SGB V) are legally obliged to take part in quality-assurance measures that make it possible to compare facilities with due regard to specific parameters and, in particular, serve the purpose of improving performance quality (section 135a of the SGB V). This process should include a presentation of the quality of treatment, healthcare procedures and treatment results.

In 2000 the German Federal Hospital Society and the leading associations of health insurance funds, both statutory and private, along with the German Medical Association and the German Nursing Council created the Federal Board of Trustees for Quality Assurance, a central advisory and decision-making panel for external quality comparison. From early 2001 this board made the then newly founded Federal Office for Quality Assurance (BQS) responsible for managing the further development of the content of external quality management and the organizational aspects of putting it into practice.



**Figure 4.3.2:** Development of quality management (QM) in German hospitals (acute care). Source: Blumenstock [35]

Quality Assurance Agreements as per § 135 Section 2 SGB V	Monitoring pacemakers
	Arthroscopy
	Hemocatharsis procedure
	Cardiology
	Magnetic resonance imaging
	Colonoscopy
	Laboratory testing
	Prolonged ECG
	Photodynamic therapy on the ocular fundus
	Diagnostic radiology and radiation therapy including mammography
Quality assessments as per § 92 SGB V	Ultrasonic monitor diagnosis
	Cytological examinations
	Quality assessment guidelines Radiology
In Preparation	Quality assessment guidelines Magnetic resonance imaging
	Guidelines to introducing an internal quality management system

**Table 4.3.1:** Examples from Germany of nationwide quality management agreements and guidelines in the area of statutory ambulatory health care provision

After the Statutory Health Insurance Modernization Act became law, the Federal Board of Trustees for Quality Assurance was replaced by the Federal Joint Medical Committee as from 1 January 2004. In accordance with section 137 of the SGB V, this conferred the final right of decision on quality-assurance measures to the Federal Joint Medical Committee in respect of all hospitals accredited under section 108 of the SGB V. Steering committees, branch offices and task forces at the state level are responsible for implementing the decisions on site (see Figure 4.3.1).

In 2004 the clinics and hospitals had to collect data for nationwide external comparative quality assurance and for central appraisal on a series of areas of healthcare provision. The data collected included: pacemakers – first implantation; aggregate replacements of pacemakers; gynaecological operations; obstetrics; hip joint endoprosthesis – first implantations; hip joint endoprosthesis – replacement; total knee endoprosthesis – first implantations; total knee endoprosthesis – replacement; breast intervention (operation); cardiac catheterization and interventions (coronary angiography, PTCA); cardio-surgical interventions; heart transplants. Quality indicators were documented for the different areas of healthcare provision: e.g. indication, process and outcome quality (which includes complications such as infections or mortality). The BQS report on the results is publicly available on the Internet ([www.bqs-online.de](http://www.bqs-online.de)); only the hospitals themselves have access to their own individual results.

Other areas of healthcare provision are also covered at the state level on a voluntary basis, e.g. data on anaesthesiology and neonatology, on cataract operations, prostatectomy and the treatment of strokes.

These external quality comparisons not only serve to measure the level of quality, they also serve to identify potential areas of improvement in clinics and hospitals. Noticeable discrepancies are discussed in a “structured dialogue” between experts of the state’s quality-assurance task forces and the clinic or hospital in question. Clinics and hospitals are required to use the results of the external comparisons for their internal quality management.

**The number of clinics and hospitals with their own quality management is rising.** The proportion of clinics and hospitals that were introducing or had introduced internal quality management rose considerably between 1998 and 2004 (see Figure 4.3.2). By 2004, 61 percent of clinics and hospitals had done so; 78 percent were regularly carrying out quality-improvement projects, 71 percent employed full-time quality managers and 27 percent had a risk-management programme. The great majority carried out patient-satisfaction surveys [35].

Since 2002, in accordance with section 135a of the SGB V, clinics and hospitals have been legally obliged to introduce and develop an internal quality-management system. An agreement signed between the leading associations of health insurance funds, including the National Federation of Private Health Insurers and the German Federal Hospital Society, with the participation of the German Medical Association and the German Nursing Council, targeted the establishment of a culture of quality in inpatient treatment that was both comprehensive and based on ethical and humanitarian values. This is intended to link the various single aspects of quality management, such as patient orientation, responsibility and leadership, economic efficiency, process orientation, staff participation, target orientation and flexibility, as well as the initiation of a continuous quality improvement process (see also section 4.3.4).

**The German Medical Association issues regulations and guidelines to ensure the quality of several types of medical revision.** Regulations on quality assurance are also to be found in the following rules and laws: the general legal provisions for the manufacturing, approval and monitoring of pharmaceutical and medical products; the X-Ray Radiation Protection Ordinance; the Organ Transplantation Act (the law on the donation, removal and transplanting of body organs); and the law regulating transfusions. The German Medical Association is responsible for imposing guidelines in order to give substance to quality assurance in the areas already mentioned. The German Medical Association's regulations and guidelines cover organ transplantation in accordance with section 16 subsection 1 no. 6 of the Organ Transplantation Act, the quality assurance of medical laboratory experiments, and quality assurance in immunohaematology, microbiology, X-ray diagnostics, computed tomography, cytological screening, the diagnosis of cervical carcinoma, and finally NMR (nuclear magnetic resonance).

**Laws and professional codes of conduct ensure standards in ambulatory healthcare.** In addition to specifying regulations governing the profession, which equally affect both ambulatory and inpatient doctors, the system of mandatory healthcare also outlines what is required by prevailing social legislation. Permission for over 30 percent of all ambulatory healthcare performed by office-based doctors is subject to reservation, meaning that the healthcare provider (for example a doctor) is first required to obtain further qualifications. These include constant further training and recertification or might involve rendering a minimum amount of professional services per annum. Random checks are also carried out on certain methods of medical care, such as MRI (medical resonance imaging).

Nowadays, there is a comprehensive range of nationwide quality-assurance agreements and guidelines intended to guarantee the beneficial affect of particular kinds of ambulatory healthcare provision (see Table 4.3.1).

The associations of SHI doctors are responsible for ensuring that these quality measures are put into practice. Under the terms of the Social Health Insurance Modernization Act, which became law in 2004, they are required to publish an annual account of their work in the form of a report, and to initiate ongoing quality-promotion measures.

**Psychotherapeutic and doctors' surgeries have to introduce a quality-management system.** Since 2004 doctors' surgeries, like clinics and hospitals, have been obliged to introduce and develop a quality-management system pursuant to section 135 a of the SGB V. In the autumn of 2005 the Federal Joint Committee laid down guidelines defining the essential elements and tools of an internally developed quality-management system, and made provision for a five-year development period. The Associations of Statutory Health Insurance Doctors will support and evaluate the preparations. No special certification of practices is called for by the provisions.

**Quality circles help professionals to learn from each other.** Quality circles, i.e. formally organized groups of members of a profession, are intended to promote constant and critical reflection on the members' own capabilities and those of their colleagues in a structured process – and thereby improve the quality of patient care [36]. Quality circles are based on peer reviewing and “problem-oriented learning”.

The National Association of Statutory Health Insurance Doctors adopted guidelines for quality-assurance procedures for the first time in 1993. Every effort was made to introduce methodologically standardized quality circles as a new approach based on

the principle of constantly improving quality [37–39]. The fundamental idea of the quality circle is to create a practice-oriented culture of learning without making participation obligatory or imposing sanctions [40]. Within a few years of its introduction, it could be seen that the system, which had already proved its worth abroad, was also proving highly successful among SHI-accredited doctors in Germany. In many cases quality circles were able to raise the standard of care while simultaneously cutting costs [41].

**Pension insurers and health insurance funds check the quality of rehabilitation clinics and hospitals.** Both rehabilitation agencies and licensed rehabilitation and nursing-care centres have obligations to maintain quality assurance as laid down in the German Social Security Code (SGB V, SGB IX and SGB XI). At present there are two parallel programmes for inpatient rehabilitation: one was imposed by the statutory pension insurers (GRV) to apply to inpatient adult rehabilitation in clinics and hospitals [42]. All 27 pension insurers are involved. The programme is coordinated by the Association of German Pension Insurers, the Federal Insurance Institute for Salaried Employees, and the Westphalia Regional Pension Insurance Board. It includes every rehabilitation hospital and clinic whose costs are mostly borne by statutory pension insurers, with a plan to extend the programme to include ambulatory rehabilitation and the rehabilitation of children and young people.

The second programme was launched by the Leading Associations of Statutory Health Insurance as a quality-assurance rehabilitation programme primarily intended for rehabilitation facilities that fall within the competence of statutory health insurance. While the programme of the statutory pension insurers deals primarily with structural quality, the SHI programme is more focused on the outcome and includes the factor of patient satisfaction in its quality assessment. The statutory health insurers produced the first Quality Report on Rehabilitation in 2004 [43]. It has already been decided to create uniform standards applicable to both programmes.

In addition to these programmes, the insurance carriers make random inspections to appraise the process quality of rehabilitation clinics and hospitals once every one and a half to two years (statutory pension insurance) or three years (statutory health insurance). Assessments are made with reference to 20 discharge reports per institution, which the statutory pension insurance makes available to all patients, while the SHI provides for assessments solely for the purpose of assessment reporting. Statutory pension insurance reports have now been standardized. Professional colleagues in the same field use a checklist that was specifically compiled for the purpose by a professional expert [42].

**Nursing-home inspections often uncover quality deficiencies.** Nursing-care service providers are subject to the quality standards laid down in the German Social Security Code (SGB XI), the German Nursing Homes Act and the general principles and indicators of quality and quality assurance. The introduction of uniform nationwide nursing-care training standards under the Nursing Care Act of 2003 was also a significant event in this respect.

Inspections are carried out on the spot by the Medical Review Board of the Statutory Health Insurers (MDK), the Nursing Homes Supervisory Authorities as well as individual nursing-care health funds. Between 1997 and 2002 the MDK alone inspected around 60 percent of all the nursing homes for the elderly in Germany, and 20 percent of these were subject to repeated inspections due to quality deficiencies [44]. It is a fun-

Type	System Target	Evaluation focal point	Main advantages	In Germany Status January 2005
European Foundation for Quality Management (EFQM)	Self-assessment, Commitment to Excellence Certificate, Recognition for Excellence Certificate, in rare cases prize award	Comprehensive measuring tool to evaluate business standards scoring under nine criteria	Comprehensive presentation of quality and quality management as part of overall business management	Approx. 300 hospitals
DIN EN ISO Norm 9001: 2000 German/European/International norms	Certificate award	QM-System	Finely developed organizational infrastructure for the certification process	Approx. 300 hospitals, 200 surgeries
Genuine medical certification systems	Self-evaluation or certificate award	Patient health care seen from the point of view of those who pay for it, the profession and patients	Adaptation to the hospital, with content-specific guidelines for good quality	JCI-A: 7 hospitals KTQ + proCumCert: 160 hospitals
Peer audits	Peer reviewing	Patient health care seen from the point of view of professionals in the same sector	Specific recommendations for quality improvement measures-	Pneumology, neurology, gynaecology, cardiology, Internal medicine, surgery

**Table 4.3.2:** Internationally quality management strategies for assessment and certification of in-patient care facilities present in Germany [45]

damental obligation of the Nursing Homes Supervisory Authorities to undertake an inspection of every nursing-care establishment in the country once a year.

Comprehensive, cooperative quality-management systems will be more necessary in the future: systems that link ambulatory, inpatient and rehabilitation services on the one hand, and medical and non-medical services and providers on the other.

#### 4.3.4 Certifications and guidelines

**Certificates can create internal and external transparency.** Certificates in a healthcare system serve a range of purposes: they help put a given institution on the map and provide a yardstick for comparing one institution with another; they provide definitive targets in terms of quality and quality improvement and identify areas where standards can be improved; they inform employees about the existence and success of quality management; they inform customers (for example patients, referring doctors, health insurers) that required standards really are being complied with.

Internal and external assessments are the basis of many certification procedures. In the late 1990s the German Medical Association, the statutory health insurance associations, the German Federal Hospital Society and the German Nursing Council started an initiative called “Cooperation towards Transparency and Quality in the Hospital” (KTQ); its development was backed by the German Ministry of Health and Social Welfare. An important element of this model is self-assessment reports by clinics and hospitals accompanied by data on performance and structure as well as information on patient orientation, employee orientation, safety and security, information management, hospital management and quality management. The reports include, for example, data on the number of beds, the regularity of certain operations, staff-training and qualification levels, and quality-management structures.

In addition to self-assessment, clinics and hospitals can register for an external assessment by a visiting team and receive a certificate if they meet all the requirements. One of the prerequisites for being awarded a KTQ Certificate is the publication of quality reports on the Internet (<http://www.ktq.de>).

The denominational hospital associations under the name of proCum Cert offer an extended version of the KTQ certificate, which includes a denominational aspect. Both procedures were developed together and are mutually recognized.

**A growing number of clinics and hospitals are being certified.** Being certified implies having to be recertified, since the certificates are always only valid for a limited period and are dependent, for example, on the level of medical and nursing-care service, quality management, and the business standard of the institution in question. Here in Germany several internationally tried and tested approaches are in use (see Table 4.3.2).

KTQ GmbH and proCum Cert GmbH have been offering KTQ certificates since 2002. 160 hospitals of the approximately 2,200 hospitals for acute cases had received KTQ or proCum Cert certificates by January 2005, and by the autumn of the same year another 390 had also done so. Another model

of medical certification that can be obtained in Germany is the international version of the JCI-A, the American certification from the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), on which most certification procedures around the world are based.

A number of German clinics and hospitals, or sections such as hospital pharmacies, obtain certificates in accordance with the internationally accepted norm DIN EN ISO 9001:2000, while other hospitals and clinics work with the European Foundation for Quality Management (EFQM) model. This model is not so much focused on certification and the presentation of quality than a structured self-assessment that is defined in terms of particular indicators and from which levels of excellence are derived [46]. Both types of approach were developed for industry in the late 1980s and later adapted to suit medical requirements.

Clinics and hospitals are under no legal obligation to obtain a certificate, but under the terms of the German Social Security Code they are obliged to introduce an internal quality-management system.

**Not only clinics and hospitals, but also doctors' surgeries and laboratories can receive certificates.** Quality-management systems and certification procedures are also a feature of the ambulatory sector. Examples include the EFQM model for surgeries; the ISO certificate of quality assurance in the surgery; the QEP programme (quality and development in doctors' surgeries) of the National Association of Statutory Health Insurance Doctors; the KTQ model for doctors' surgeries; the peer-assessment-based EPA model (European Practice Assessment); the KPQM certificate of quality-management systems for surgery standards issued and devised by the Association of SHI-accredited Doctors of Westphalia-Lippe and now issued by similar associations in other federal states.

The quality-management requirements for medical laboratories are laid down in the German Industry Norm DIN EN ISO 15189. This extends beyond the requirements of DIN EN ISO 9001:2000 and relates primarily to the dependability of measuring results and findings. In Germany, specific, voluntary certification procedures are based on official and recognized norms.

**A badly managed sequence of events is a major cause of medical malpractice.** It has been known for some time that since medicine is a “praxeological science” [47, 48], process quality (the quality of the treatment process) has considerably more influence on the result of therapy than structural quality (e.g. the range of equipment available at a facility). This is confirmed by analyses of poor treatments, which can be attributed to inadequate process quality in about 70 percent of cases. Particularly liable to lead to treatment errors are problems of liaising and coordination among those involved, poor record keeping, transferral problems, and inadequate or non-existent therapy guidelines [49, 50].

Structured procedural assistance such as guidelines and so-called clinical pathways have become increasingly important

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#### Definition

Certification is understood to refer to a procedure whereby an independent third party confirms in writing that a product, method, service or organization has fulfilled all prescribed requirements.

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#### Definition

Guidelines are understood here as systematically developed recommendations on the diagnosis and treatment of specific illnesses. They reflect the current state of medical knowledge and make it easier for both doctors and patients to choose the appropriate treatment for an illness in a given situation.

over the last few years. It is widely hoped that they will raise the general standard of treatment procedure.

**Systematic research aims to separate the wheat from the chaff.** Guidelines are based on evidence – a word now also used in German to indicate information obtained from clinical studies that confirm or contradict the conclusions drawn from given circumstances. In recent years the English term “evidence-based medicine” has become a part of the German medical lexicon. Its purpose is to include the experience of the doctor giving treatment and the patient’s personal situation in reaching decisions on treatment that are based on systematically acquired practical research results [44, 45].

The most important evidence-based medicine initiative to date was founded in 1993: the Cochrane Collection, named after its founder, the British epidemiologist Sir Archibald Cochrane. More than 4000 specialists are now part of an international network of experts who are gathered into review groups that submit systematically prepared overviews (reviews) on specific subjects in the field of healthcare. These reviews bring together all the relevant studies and research results relevant to a diagnosis or treatment issue and are published in a database, to which new reviews are added in quarterly updates (Cochrane Database of Systematic Reviews). The German Cochrane Centre is located at the University of Freiburg and sponsored by the Federal Ministry of Health.

**General guidelines provide the parameters of medical treatment guidelines.** Whilst Cochrane Reviews evaluate individual approaches to therapy, guidelines go further than this, providing the parameters of medical treatment guidelines for particular illness situations. The purpose is to provide those involved with an update on the current state of scientific knowledge and to make treatment safer, more economical and easier to plan.

General guidelines lay down treatment recommendations for doctors and nursing-care staff to follow. They lay down standards in cases where the state of knowledge is tried and tested and free of ambiguity. Furthermore, they are a useful source of information for the public. The guidelines of the Association of Scientific Medical Societies in Germany (AWMF) are divided into three levels: guidelines at level 1 (S1) make recommendations for treatment and are based on the informal consensus of a group of experts. Guidelines at level 2 are characterized by an official consensus (e.g. a structured consensus or Delphi conference) reached by a representative panel or by a systematic weighing up of the evidence contained in statements. Guidelines at the highest level, level 3, are evidence-based and adopted by a representative panel at a structured consensus meeting. They take their orientation from logical decision-making processes (clinical algorithms) and include relevant outcome indicators for patients and costs.

The Association of Scientific Medical Societies (AWMF) has now issued 850 guidelines in various quality categories. Apart from professional societies, guidelines are also issued by the Pharmaceutical Commission of the German Medical Profession and the German Network for Quality Development in Nursing Care as part of the programme for guidelines in national healthcare (sponsored by the AWMF, the German Medical Association and the National Association of Statutory Health Insurance Doctors).

**Clinical pathways are navigational instruments for treatments within a healthcare centre.** Unlike guidelines, which indicate how individual branches of a profession should act, clinical pathways refer to the overall body of treatment in a healthcare centre.

Guidelines and clinical pathways are, in turn, points of departure for the development of comprehensive and structured treatment programmes (disease management programmes, DMPs). Disease management means optimizing treatment procedures amenable to standardization for precisely defined groups of patients.

Book V of the German Social Security Code (section 137f of the SGB V) provides the basis on which to develop structured programmes of treatment for patients with specific chronic diseases. Currently there are programmes for breast cancer, type 2 diabetes, and coronary heart diseases. By now, more than a million patients have been enrolled in one or other of these programmes.

In 1995 the German Medical Association and the National Association of Statutory Health Insurance Doctors jointly set up the Medical Centre for Quality in Medicine (as it has been called since 2003). It provides assistance to both organizations in carrying out their responsibilities in the field of quality assurance. Its main tasks are to appraise medical guidelines, assess tools for promoting quality and transparency, and draft and prepare information for patients; it bears ultimate responsibility for the development of national guidelines in important areas of healthcare.

**National guidelines aim to create recognized reference standards.** In 2002 the German Medical Association (BÄK) launched a National Programme on Disease Management Guidelines. In autumn 2003 responsibility for the management of the programme was passed on to a cooperative body involving the German Medical Association (BÄK), the National Association of Statutory Health Insurance Doctors (KBV), and the Association of Scientific Medical Societies in Germany (AWMF).

National healthcare guidelines are intended to provide evidence-based assistance with specific healthcare problems in an interdisciplinary context that links all aspects of the respective situation. What is especially important is the fact that these national healthcare guidelines contain guidelines on disease management programmes. They also give doctors orientation and guidance in view of the growing quantity of medical information that is available, which is increasingly difficult for doctors to handle. The concept of healthcare guidelines relies solely on medical expertise and scientific evidence.

There is a national guideline on bronchial asthma; the guidelines on type 2 diabetes have been updated; guidelines on coronary heart disease and chronic obstructive pulmonary disease (COPD) are in preparation.

**The appraisal of new kinds of medical technology is becoming more important.** Another tool to support quality orientation in healthcare is provided by the assessment procedure of medical procedures and technologies (HTA, health technology assessment). Originally an incidental result of assessing the consequences of technology, HTA is used to evaluate the usefulness and costs of new diagnostic and therapeutic methods. The process is based on systematic research into the relevant literature as well as the analysis and critical appraisal of the available evidence. This provides a scientifically sound basis for decisions

#### Definition

A clinical pathway is an institutional guideline. It serves as an orientation guide for optimal procedural organization regarding the overall hospital treatment of one particular illness. It involves all the professional groups involved in the treatment (e.g. doctors, nurses, orderlies, physiotherapists) [51].

on the introduction of a new medical treatment into day-to-day healthcare.

In Germany, the first steps were taken by the «German Scientific Working Group of Technology Assessment in Healthcare» based at the Hanover Medical School. In 2000 the German Institute of Medical Documentation and Information (DIMDI) was assigned the task of setting up an information system, complete with its own database, for evaluating the effectiveness and costs of medical techniques and technology and allocating the various research tasks relevant to it. The HTA agency created for the purpose by DIMDI began its work in 2002.

In addition, the German Medical Association and the National Association of Statutory Health Insurance Doctors in 2001 together founded a project group called «Medical Techniques Assessment». This aims at making the methodology of HTA better known among doctors and laying down its own standards of assessment quality for the appraisal of examination and treatment methods.

The Statutory Health Insurance Modernization Act, which became law in 2004, tackled the concept of evidence-based healthcare, including HTA methodology. Assessing the usefulness of medical products and researching, presenting and evaluating the status of diagnostic and therapeutic techniques in current medical science are the core responsibilities of the newly founded Institute for Quality and Efficiency in Healthcare (IQWiG). The information it produces is to be prepared and presented in a way which patients and other interested people can understand (see also sections 4.3.5 and 6.1).

**The medical associations undertake numerous quality initiatives at the state level.** Responsibility for ensuring the quality of medical healthcare practice lies with the regional (state) medical associations and is laid down in the Federal State Acts on Councils for the Medical Professions (German chamber law for the healthcare professions) to ensure the quality of medical healthcare practice. On the basis of this legal status and independently of social security regulations, the state medical associations have launched numerous initiatives in the field of quality assurance and quality management, which have subsequently often been adopted by the national legislature and made part of national social security legislation.

The autonomous initiatives started by state medical associations include programmes on quality assurance in pre-clinical emergency services, the treatment of strokes, psychotherapy, out-of-hospital obstetrics and oncology. A complete overview of the numerous quality-assurance initiatives and individual projects undertaken by the medical associations can be found in the 2006 combined Quality Report of the German Medical Association and the state medical associations.

#### 4.3.5 Transparency and patient safety

**Professionally tried and tested information should be available to patients.** Informed patients require scientifically sound information, which is made available from a variety of institutions. The Centre for Quality Assurance in Medicine runs a patient information bulletin service on the Internet ([www.patienten-information.de](http://www.patienten-information.de)). This offers scientifically sound, non-commercial information, and since 2001 it has been officially recognized pursuant to the German Social Security Code (section 65b of the SGB V) as an independent consumers' and patients' advice centre.

From the outset, the Institute for Quality and Efficiency in Healthcare has also carried out its obligation to provide information on quality and efficiency in the healthcare system that is readily comprehensible to ordinary people ([www.iqwig.de/](http://www.iqwig.de/) and [www.gesundheitsinformation.de](http://www.gesundheitsinformation.de); for more information providers see section 6.3). The brochure published by the then Federal Ministry of Health and Social Security entitled "Ensuring Quality in the Healthcare System" includes checklists for patients, which they can use to review the quality of their treatment [52].

Under the provisions of the German Social Security Code, hospitals and associations of statutory health-insurance doctors have to publish quality reports to help members of the general public, patients, service providers and insurance carriers to reach greater quality transparency and to help them make the right choice of welfare facility.

**To date there are no reliable data on the frequency of medical malpractice.** Errors in treatment, care and organizational shortcomings have increasingly been at the centre of attention in recent years, yet in Germany there is no standard and comprehensive presentation of the number of suspected or proven cases of medical malpractice. The picture of the extent of medical malpractice given by the current methods – the number of liability insurance cases registered by the insurance companies plus the number of complaints dealt with by the State Medical Chambers' commissions on medical malpractice and arbitration boards – is far from complete.

Claims of medical malpractice relate principally to the surgical disciplines and often claim incorrect hospital treatment. Not counting specialist issues, three major causes of medical malpractice stand out: organizational shortcomings, poor record keeping, and treatment using unsuitable or inadequate facilities. Approaches to the prevention of medical malpractice should include the introduction of quality-assurance and management tools. For example, the internal analysis of compilations of complaints from the records of the health insurance advisory commissions or medical review boards can help in the prevention of malpractice.

► Comprehensive information on **Medical Malpractice** is to be found in booklet 5 of the Federal Health Reporting's series [49].

**The role of critical-incident-reporting systems is to make it possible to learn from the mistakes of others.** Numerous clinics have started introducing internal voluntary systems for reporting critical incidents. In 2005 two Internet platforms were available for doctors in private practice to anonymously exchange experience on critical day-to-day healthcare incidents and ways of avoiding them. One was the National Association of Statutory Health Insurance Doctors' Critical Incident Reporting System, which was adopted from the Swiss model (<https://www.cirsmedical.ch/kbv/cirs/cirs.php>). The other was a critical-inci-

dent-reporting system tailor-made for GPs at the University of Frankfurt ([www.jeder-fehler-zaehlt.de](http://www.jeder-fehler-zaehlt.de)).

A nationwide multi-centre study of medico-legal reporting on alleged fatal and non-fatal medical malpractices was carried out on behalf of the then Federal Ministry for Health and Social Security. Published in May 2005, the study presented findings on the manner and occurrence of medical malpractice, as well as the nature and extent of the damage caused, and made a comprehensive classification of different kinds of medical malpractice. It also covered consequences for coordinated research into damage caused by medical misadventure [53].

The 2005 German Medical Assembly made deficient management and patient safety a point on its agenda. At the same time, all the organizations involved in the health system founded the Coalition for Patient Safety. Its purpose as an organized network is to coordinate all the initiatives on preventing malpractice that are already in place – undertaken by medical-self administration, the professional medical societies and health insurers – and to offer them every possible encouragement on a voluntary basis.

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**Key statements**

- ▶ Germans spend approx. €240 billion a year on their health, the equivalent of about a tenth of the country's total economic output and more than the federal government's annual tax revenue. (Page 187)
- ▶ The statutory health insurance funds pay over half of total health costs. (Page 187)
- ▶ Expenditure on social long-term care insurance has risen considerably since inpatient nursing care was added to the schedule of insurance benefits. Expenditure went up by 16 percent between 1997 (the first year in which the insurance scheme was fully implemented) and 2003. (Page 189)
- ▶ The administrative costs of social insurance carriers and private healthcare insurance companies totalled approx. €13 billion in 2003. (Page 191)
- ▶ With an annual expenditure of €65 billion, hospital healthcare is the biggest single expenditure block. Doctors' surgeries and pharmacies together spend about as much as hospitals. (Page 191)
- ▶ Direct purchases and co-payments constitute about a fifth of total expenditure on health. (Page 193)
- ▶ Cardiovascular diseases account for the biggest single item of health expenditure: €35 billion per annum (base year 2002). (Page 195)
- ▶ In an international comparison per capita expenditure, Germany is in the upper middle group of western industrialized nations. (Page 197)

## 5 How much are we spending on our health?

### ► Abstract

Expenditure on health in Germany rose continuously between 1993 and 2003, a development caused by several factors. In particular, the introduction in 1995 of statutory long-term care insurance – which is included under health expenditure here – has both extended the scope of healthcare provision and appreciably increased employment levels. Price developments and quality improvements in the provision of healthcare services, along with changes in the volume of healthcare provision, are responsible for the rising expenditure on health. Above all, progress in medical technology leads to constantly rising costs. Nevertheless, the disproportionate increase in expenditure in certain branches of healthcare provision (for example in the field of pharmaceutical products) can also be attributed to a lack of economic incentive.

Expenditure on health goods and services is growing against the background of increasing life expectancy and falling mortality rates. Although a direct relation between trends in health expenditure and the health status of the population cannot be conclusively proved, high levels of expenditure do in fact tend to accompany an improved availability of healthcare services.

Numerous factors, some of which are socially determined, impact on the level of health expenditure, the constituent elements of expenditure and their relative proportions, as well as the health situation in general and the population's level of satisfaction with their health. The affects of these factors cannot be considered in isolation.

A key economic indicator – also in international comparisons – is the proportion of expenditure on health in terms of total economic output, or gross domestic product (GDP).

This proportion has shown a moderate increase over the past few years, i.e. expenditure on health has risen slightly faster than expenditure in other sections of the economy. Given that health expenditure is not only a matter of the individual consumer choice on the part of private households, but is in fact financed largely by social insurance contributions made by employers and employees, containing and controlling health expenditure would appear to be necessary.

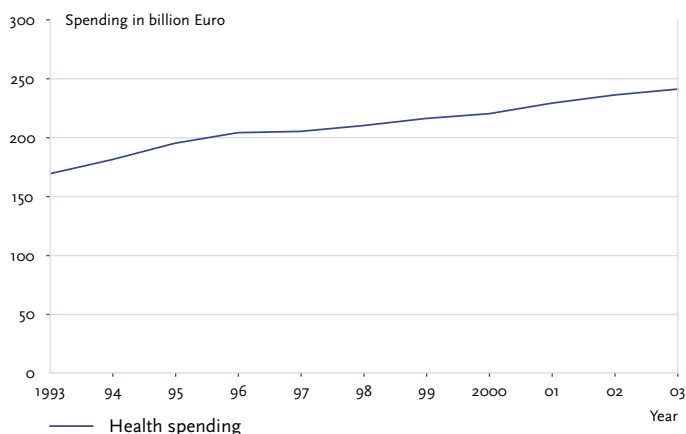
Expenditure on health tends to be regarded one-sidedly as just another cost factor. Yet it is often overlooked that new and costly therapies and technology increase both life expectancy and the quality of life. Another fact that needs to be emphasized more is that the healthcare system is an extremely important employment market. In Germany, 4.2 million people (one person in nine) work in one way or another in the healthcare system, compared to only one in fifty in the motor industry, for example. The healthcare system is going to need more staff just to cope with the increasing number of elderly people in need of treatment or nursing care. The bulk of health costs in Germany are covered by statutory health insurance. Other third-party contributors include statutory long-term care insurance, statutory pension insurance, statutory accident insurance, private health insurance, employ-

ers, public authorities, private households and miscellaneous non-profit organizations. The expenditure of all third-party contributors (except public authorities) rose significantly between 1993 and 2003. The main reason for the decline in expenditure by public authorities was the introduction of the statutory long-term care insurance scheme, which mainly took the pressure off public-assistance expenditure. The biggest increase in expenditure was among private households, charitable and non-profit organizations and private health insurance.

About half of total healthcare costs are generated by the provision of medical, therapeutic and nursing care. So-called medical goods, such as drugs, remedies, adjuvants and dental prostheses, account for more than a quarter of the expenditure. Although expenditure on preventive-care measures rose by about €4 billion between 1993 and 2003, as a proportion of total healthcare costs expenditure on preventive care hardly rose at all (+5 percent). Similarly, despite the rise in the total payments, there has only been a small proportionate increase in administrative costs of 5.5 percent since 1993. In 2003 expenditure on healthcare goods (defined here as including drugs, remedies, adjuvants, dental prostheses and other medical needs) came to €64 billion, a higher proportion of expenditure than the amount spent on medical services (approx. €62 billion) or on nursing and therapeutic care (about €55 billion). By contrast, in 1993 expenditure on medical services was higher than that on goods. There has thus been a marked shift in the pattern of medical healthcare since then. Where different types of institutions and facilities are classified separately, it can be seen that most of the money goes into the ambulatory sector: specifically doctors' surgeries, dental surgeries, pharmacies, the surgeries and offices of other healthcare providers, small medical devices and ambulatory nursing care. In 2003 €112 billion was spent on this area of healthcare. A comparison between hospital expenditure and that of outpatient medical services shows that expenditure in the former, currently €65 billion, is significantly higher than that of doctors' and dental practices, which is currently €48 billion per annum. As a result of the socially desirable and legally binding extension of the schedule of services in long-term care insurance, the sharpest increase in expenditure during the period under review was in this area.

A breakdown of the costs of illness shows that cardiovascular diseases cause the most costs, followed by diseases of the digestive system (including high costs for dental services and dental prostheses). In third place come costs linked to diseases of the musculoskeletal system and connective tissue. In general, the costs of illness vary considerably with gender and age.

Rising health costs are not peculiar to Germany. They can be observed throughout the western industrialized world. They are rising more dramatically in some other countries. A comparison of per capita expenditure worldwide places Germany above the international average at the same level as the Netherlands and Switzerland, countries which also consider ensuring the health of their populations to be a priority.



**Figure 5.1.1:** Development of health expenditure in Germany (nominal).

Source: Federal Statistical Office 2005

### **Legislation in the field of statutory healthcare insurance**

The healthcare system in eastern Germany was restructured as far as possible on west German principles after German reunification in 1989/1990. This involved substantial additions to the medical facilities in the east so as to provide the insured population there with the entire range of healthcare provision available in the west in a relatively short space of time. Appreciable increases in expenditure, including expenditure on individual sectors, came in the wake of German reunification.

This rise in health expenditure was anticipated, but in the former West Germany increases in expenditure and the related difficulties for the statutory healthcare insurance were such that the government was prompted to enact

new legislation. The Healthcare Structure Act, which became law on 1 January 1993, introduced measures to stem health expenditure, a risk-adjustment scheme (compensatory transfers between statutory healthcare insurance funds), and the right of people insured under statutory healthcare insurance to choose their own health insurer. Changes to the law between 1996 and 1997 further stemmed the rise of healthcare expenditure and actually led to a fall in SHI expenditure for a short period. Despite limits on co-payments in certain cases and improvements in healthcare provision (enacted by the Solidarity Improvement Act of 1997 and the Health Service Reform Act of 2000), the rate of increase in expenditure was initially quite moderate, but since 2001 it has begun to accelerate. The situation was made more

critical by a growing income gap on the part of statutory health insurers, and has resulted in an increase in insurance contributions. Again, legislation was enacted to counter the upward trend. In contrast to legislation focusing primarily on cost restraint, legislation since 2000 has contained a multitude of structural measures aimed at improving quality and efficiency and making services more oriented towards patients' needs. Other third-party contributors also had to increase expenditure, some of them quite significantly, in 2001 and 2002 (see below). This reflected not only the particular circumstances of individual third-party contributors, but also economic developments affecting all cost carriers.

## 5.1 Healthcare expenditure

### ► Abstract

In 2003 expenditure on healthcare in Germany totalled approx. €240 billion, an increase of €71.7 billion (or 43 percent) over 1993. Increases were particularly marked between 1994 and 1996 as a result of several factors: the effect of German reunification and the costs involved in raising standards in eastern Germany to those of the west, the introduction of compulsory long-term care insurance in 1995, and expenditure growth in some healthcare sectors so disproportionate as to lead (among other things) to legislative intervention.

Statutory healthcare insurance, with a volume of €136 billion in 2003, was the most important third-party contributor. SHI expenditure has risen by a moderate average of 3.2 percent per annum. The level of expenditure growth has been low, partly as a result of legislative measures to limit spending, and ways have evidently been found to economize in certain sectors – that of drugs is a case in point. By contrast, expenditure in the private healthcare insurance sector has been rising at an above-average rate of 4.8 percent per annum. Costs have risen appreciably since the introduction of mandatory long-term care insurance premiums in 1995, especially since the inclusion of inpatient care in 1996. The public sector, notably the local authorities, was relieved of a financial burden for the same reason, and only the public sector has been able to record a fall in healthcare expenditure compared to 1993. Nearly half of all healthcare expenditure in 2003 was on medical, nursing and therapeutic healthcare provision; just over a quarter was spent on medical goods, including drugs and dental prostheses. The administrative expenses of the social insurance carriers and private health insurers accounted for 5.5 percent of health expenditure.

### Definition

Health expenditure is defined here as expenditure on the final consumption of healthcare goods and services plus investment in the healthcare sector.

Capital outlays such as the cost of producing drugs by the pharmaceutical industry and its sales to pharmacies are not explicitly included under health expenditure. The Federal Statistical Office, in its data on health-expenditure accounting, recognizes research-and-development costs as forms of health expenditure insofar as they are costs borne by third-party contributors. The costs of nursing care, health and safety at work, and measures to reintegrate people into working life also count as forms of health expenditure.

Other expenses that may be regarded as connected with a person's state of health in a broader sense do not count as part of health expenditure. These include accommodation in an old peoples' home, for example, since dealing with illness and disease is not the principle aim of such an establishment. The costs of fitness and wellness programmes are also not statistically regarded as part of healthcare expenditure.

Health-related benefit payments refer to transfer payments such as sickness benefits, early retirement pensions (in the case of occupational disability or incapacity for work), and salary continuation payments. Their main purpose is to provide the sick and injured with the financial wherewithal for everyday life and to keep them from grave financial difficulties during periods of illness. Strictly speaking, such payments do not count as health expenditure, and they are recorded separately from health expenditure accounts.

**Germans spend almost €240 billion a year on their health.** Health expenditure in Germany totalled €239.7 billion in 2003. A further €65.3 billion was spent on health-related benefit payments. Sickness benefits and salary continuation payments, which are included in this figure, have fallen significantly over the past two years as a result of the decline in the number of days lost to work through sickness.

**Developments have been marked by expenditure growth and intensive legislative activity.** Between 1993 and 2003, healthcare expenditure rose nominally (in terms of the prices of the time) by a total of €71.7 billion or 42.7 percent (see Figure 5.1.1). This corresponds to a real increase (assuming constant prices with no inflation) of 20.2 percent. Prices in the healthcare sector are generally rising faster than average. This so-called negative price-structure effect (which is typical of the service sector) can be explained by the fact that the development of salaries and wages is similar in the health sector to other sectors of the economy, but that productivity growth has been slow in comparison with other sectors [1]. Expenditure increase in the healthcare sector can explain this only in part.

Healthcare expenditure rose particularly sharply in Germany between 1993 and 1996, after which the pace slackened. The reasons for the sharp rise up to the mid-1990s are to be found in German reunification and the extension of healthcare provision which came with the introduction of statutory long-term care insurance in 1995.

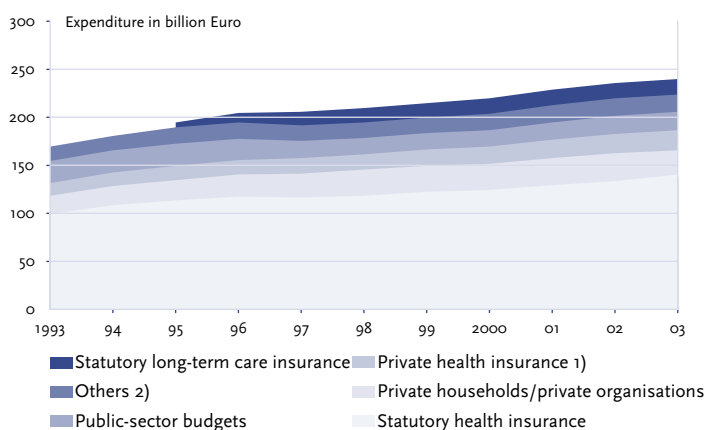
Explanations of the changes in the level of health expenditure cannot ignore the state of health of the population as a major factor influencing healthcare utilization, even though there is no direct relation between health expenditure trends and the population's state of health. The number of hospital patients per 100,000 rose appreciably in the decade from 1993 to 2003; at the same time there were fewer contacts with medical practitioners [2]. Chapter 4 of this report provides detailed information on the availability and use of healthcare provision.

### 5.1.1 Expenditure: third-party contributors

**The statutory health insurance funds are the main cost carriers in Germany.** There are various third-party contributors bearing the costs of healthcare in Germany. These include statutory health insurance, statutory long-term care insurance, statutory pension insurance, statutory accident insurance, private health insurance (including private long-term insurance), private charitable and non-profit organizations (for example churches or other charitable organizations), employers and the state (e.g. income support).

In 2003 health expenditure by statutory health insurance was €136 billion: 56.7 percent of the total for the year. The second-largest cost-bearing group was made up of private households and private charitable and non-profit organizations – which spent €29.4 billion on health goods and services, 12.3 percent of total expenditure. Private health insurance followed in third place with €20.6 billion, or 8.6 percent.

**The rise in expenditure was most pronounced in private health insurance and long-term care insurance.** With the exception of the state, all third-party contributors and patients were affected by rising costs between 1993 and 2003, although the actual increase in the financial burden varies considerably. Proportionately, private health insurance recorded the highest average annual increase in expenditure over this period: 4.8 percent, i.e. an absolute increase of €7.7 billion. This sum includes the cost



1) Including private mandatory long-term care insurance (since 1995), post office clerk health insurance and health insurance of German Federal Railways officers

2) Social pension fund, statutory accident insurance, employers

**Figure 5.1.2:** Development of health expenditure by payer. Source: Federal Statistical Office 2005

of private long-term care insurance (from 1995) and the special health insurance provided in Germany to national post office and rail service employees. Among the main factors causing the increase were higher medication costs and administrative expenses.

In the long-term statistical overview of healthcare expenditure between 1993 and 2003, long-term care insurance is something of a special case, because it was introduced gradually from 1995 onwards. This explains the increases in expenditure between 1995 and 2003 (see section 5.1.1.1 on the effects of long-term care insurance).

There was also above-average growth in expenditure by private households and charitable and non-profit organizations: €11 billion, corresponding to an average annual growth rate of 4.7 percent. Higher costs for the provision of nursing and therapeutic care in particular contributed to the above-average increase in expenditure.

The total increase in statutory health insurance expenditure was €36.8 billion. The average annual rise of 3.2 percent was lower than that for overall expenditure on health, which grew by 3.6 percent over the same period. The comparatively moderate rates of increase among the major third-party contributors are evidence of the effectiveness of legislative measures and of cost-efficiency improvements.

Expenditure by public and private employers rose between 1993 and 2003 by about €3 billion (3 percent per annum).

The introduction of the Growth and Employment Promotion Act, which became law on 1 January 1997, had a noticeable effect on the expenditure level of statutory pension insurance (GRV). The new law cut general rehabilitation programmes from four to three weeks, leading to an appreciable fall in the provision of medical rehabilitation services. GRV health expenditure, much of which is expenditure on rehabilitation provision paid for by the GRV, fell by 27 percent in the first year of the new law. In 2003 €4.3 billion in GRV expenditure went on rehabilitation measures and the provision of other healthcare services, €200 million more than in 1993. This increase was well below the average rises for other third-party contributors.

The public sector was the only contributor whose level of expenditure on health fell between 1993 and 2003; its costs include those of health-related welfare benefits, social benefit payments and public health responsibilities. The principal factor contributing towards lower expenditure, which led to a total reduction of €3.8 billion for the public sector, was the introduction of statutory long-term care insurance, a measure that has already led to an unambiguous and sustained saving in public-sector health costs of €6 billion compared to 1994 [3].

### 5.1.1.1 Effects of long-term care insurance

In 1995 long-term care insurance was made the fifth pillar of social security in Germany. This followed on from a growing recognition in the course of the 1980s that more and more people were in need of long-term care, and that this need was frequently more than the people affected or their families could cope with.

**Expenditure on long-term care insurance totalled € 17.5 billion in 2003.** Full inpatient care was the biggest cost factor (47 percent), followed by home nursing-care allowances (23 percent) and benefits in kind (14 percent) [3]. Just under € 1 billion of total long-term care insurance expenditure is paid by social security. Since such payments are more like income benefits than provisions in kind, this figure is not included in the following analysis.

Expenditure on long-term care insurance rose between 1995 and 2003 in line with its phased introduction. The increase can be explained by the revision of criteria for the funding of long-term care costs, which moved the relevant responsibilities to long-term care insurance, thereby reducing the financial burden on the previous cost carriers. Individual third-party contributors were affected to varying extents. Most strikingly, public-sector expenditure on nursing care fell appreciably, as many people in need of nursing care were no longer dependent on social welfare after the introduction of long-term care insurance, but could afford to pay for their own care. Expenditure growth in nursing-care provision was moderate for the SHI, since the segment it covers does not include long-term care. Long-term care insurance expenditure rose by 16 percent between 1997 (the first year after its introduction was completed) and 2003.

**The cost development of long-term care also reflects the population's growing healthcare needs.** The number of recipients of nursing care has risen significantly since the introduction of statutory long-term care insurance, although the increase in demand has slackened off in recent years in comparison to the former rise [3]. In 2003 approx. 2.1 million people in Germany (2.5 percent of the population) received long-term outpatient or inpatient care (see also Chapter 1.3.4 The Need for Nursing Care). The need for nursing care shows a clearly recognizable trend towards professional nursing care provided by ambulatory services and nursing homes.

An appreciable improvement in the infrastructure of nursing-care centres has accompanied the rising demand for nursing care. In 2003 a total of 10,600 ambulatory nursing-care services and about 9,700 semi-inpatient and inpatient nursing homes were accredited nationwide. Thus, the number of ambulatory nursing-care services rose to a high level in response to the increase in demand, but is now constant. The number of nursing homes has risen by 10 percent since 1999.

**Structural changes for benefit recipients and inpatient nursing services affect long-term care expenditure.** Over the years, inpatient and semi-inpatient nursing care has become a growing part of overall nursing-care expenditure. It accounted for € 8.4 billion in 2003, more than half of total expenditure on long-term care insurance for that year, while ambulatory nursing accounted for 17 percent of total expenditure (€ 2.8 billion). A quarter of the expenditure on long-term care insurance (€ 4.1 billion) went to various other facilities and private households, largely in the form of nursing-care allowances.

The different rates of expenditure growth in the fields of ambulatory and inpatient nursing-care provision in the first few years after the introduction of long-term care insurance have mostly evened out since 2000. They are now all growing at an average annual rate of three. By contrast, since 1997 the expenditure of long-term care insurance in other sectors and in private households has been falling continuously by one percent.

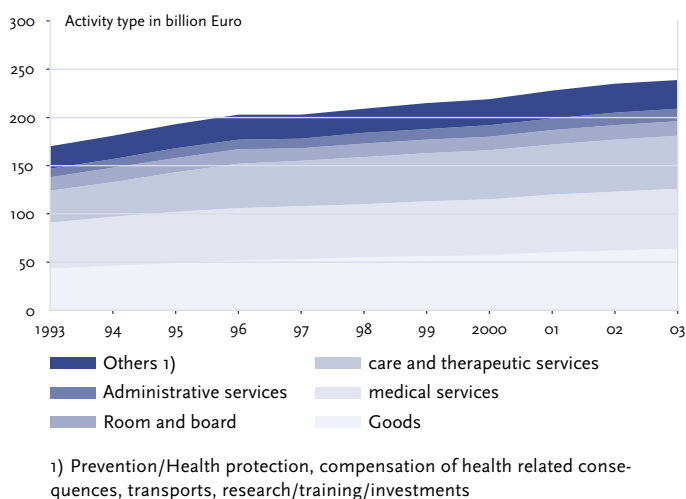
All in all, the importance of nursing-healthcare provision is expected to continue rising, as the number of elderly people in need of care is itself expected to rise in the years to come [3].

#### Definition

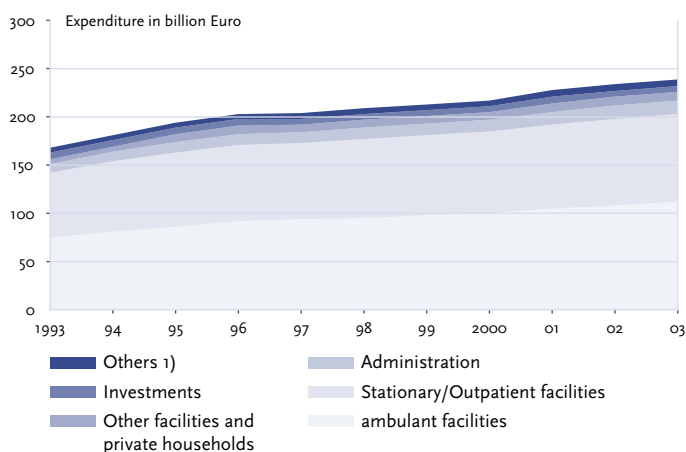
Long-term care insurance covers the costs of starting nursing care after a need has been officially established. 35 percent of third-party contributors' total expenditure on nursing-care provision was covered by long-term care insurance in 2003. By comparison, statutory health insurance usually paid for the costs of accommodation, as well as other services needed

- ▶ to ward off the need for inpatient nursing care, or
- ▶ to prevent a condition from worsening, or
- ▶ to ease the consequences of the need for nursing care, and
- ▶ to cover home-care expenses.

The SHI's share of total nursing care expenses was 41.8 percent in 2003.



**Figure 5.1.3:** Development of health expenditure by activity type. Source: Federal Statistical Office 2005



**Figure 5.1.4:** Development of health expenditure by type of facilities. Source: Federal Statistical Office 2005

## 5.1.2 Expenditure: healthcare provision

**The lion's share of expenditure is caused by just a few types of healthcare provision.** Within the wide spectrum of services provided by the healthcare system, a few are particularly cost-intensive. In fact, almost half of total expenditure is used for the provision of medical services, nursing and therapeutic care; over a quarter of total expenditure is spent on so-called medical goods such as pharmaceuticals, therapeutic appliances, dental prostheses and others. €117 billion was spent on medical, nursing and therapeutic care and over €64.1 billion on medical goods in 2003: 59 percent of expenditure on medical goods was on drugs, 20 percent for cures and remedies, 10 percent for dental prostheses and 12 percent for various other requirements.

In 2003 expenditure on goods made up a higher proportion of total health expenditure than medical-care provision (26.8 percent vs. 26 percent). In 1993, it was the opposite way round: 28.5 percent of the expenditure was on medical-care provision and "only" 25.3 percent was on medical goods. Provision of nursing and therapeutic care ranked third with 22.8 percent in 2003 in terms of share of total expenditure from the statistical perspective given here.

**Pharmaceutical products are among the biggest expenditure blocks in statutory health insurance.** The Healthcare Structure Act of 1993 and changes made to the law in 1997 have had an influence on pharmaceutical expenditure. In both cases, the patients' contribution rate was raised, but the 1993 act also imposed a recourse liability on healthcare providers that reduced costs to below previously agreed drug prescription budgets and temporarily cut SHI expenditure. Despite numerous structural measures – such as the introduction and extension of the fixed price regulation, encouraging the prescription of cheaper generic drugs, and modifications to manufacturer, wholesaler and pharmacist discounts – pharmaceutical expenditure has continued to rise, causing repeated legislative interventions to try to curb the trend. Between 1993 and 2003 SHI expenditure on pharmaceutical products alone rose by €10 billion (an average of 4.9 percent per annum) to €26.2 billion. Pharmaceutical expenditure by all third-party contributors totalled €37.5 billion in 2003.

Between 1993 and 2003 expenditure on dental prostheses stopped rising and instead began to fall as a result of various changes in the law. Until insurers' fixed therapy-related allowances were introduced by law in 1998, expenditure on dental prostheses had risen continuously. However, expenditure fell sharply in the wake of the change in the law. With the reintroduction of the percentage contribution scheme, insurers' expenditure on dental prostheses rose again to €3.8 billion in 2003. Total SHI expenditure on dental treatment, including prostheses, went up from €9.7 billion in 1993 to €11.8 billion (2003). This corresponds to a rise of two percent per year, below the average for healthcare expenditure: around €400 million of

### Definition

Third-party contributors' administrative expenses are here understood to include material management costs (such as building rents, telecommunications, technical purchases and installations, computer software and similar items) and the so-called "salary and benefit costs", which consist mainly of salaries, old-age security programmes and so on. Administrative expenses also include the costs of legal prosecutions, arbitration proceedings, and guidance for patients in cases of suspected medical malpractice, and so forth.



SHI expenditure in 2003 was for prophylactic provision by the insurance funds.

Expenditure on medical provision rose by €14.3 billion to €62.3 billion between 1993 and 2003, an increase of 2.7 percent per year, which is lower than the average rate of growth of total healthcare expenditure. The moderate nature of the increase stems among other things from the budgeting of most ambulatory healthcare provision. Even so, medical provision still accounts for about a fifth of the total increase in healthcare expenditure.

**Cost containment has slowed the increase in the health insurance funds' administrative costs.** In 2003 health-related administrative activity cost the social insurance carriers (SHI, statutory pension insurance, statutory accident insurance and statutory long-term care insurance) a total of €9.5 billion, €3.2 billion more than in 1993, corresponding to a mean rise of 4.1 percent per year.

SHI administrative expenditure came to €8 billion in 2003, an average rise of 3.7 percent per year. Part of the increase can be explained by historically determined factors relating to company health-insurance funds. Since the 1990s, a number of company health-insurance funds have made use of the legally provided opportunity to transfer staff administrative costs, previously borne by the employer, to the insurance fund itself, thereby bringing themselves into line with other insurance funds. These costs have only appeared as health expenditure since the introduction of the new regulations.

Healthcare-related administrative expenditure was capped to stem the above-average rise that had taken place in previous years. The capping regulation stipulates that the administrative expenditure of the health insurance funds must not rise faster than their members' income. The administrative costs per member of a health insurance fund are capped if they exceed a level that is ten percent over the average. Capping administrative expenses reduced their rate of growth from 6.2 percent in 2002 to 1.7 percent in 2003, an appreciable reduction. Administration's share of total SHI healthcare expenditure was thus reduced from a record high of 5.9 percent in 2002 to 5.8 percent in 2003.

The statutory health insurers are keen to point out that administrative costs constitute a significantly lower proportion of their total expenditure than the average of approx. 17.6 percent among private health insurers, with their commission payments and wide network of representatives. In 2003 administrative expenditure by private health insurers totalled €3.6 billion. The costs have risen by an average of 5.4 percent every year since 1993.

### 5.1.3 Expenditure: healthcare facilities

**Hospital healthcare is traditionally the largest single expenditure item.** Hospital healthcare generated expenditure of almost €65 billion in 2003, 27 percent of total health expenditure. This was an increase of €15.2 billion over 1993. Hospital healthcare expenditure rose by an average of 2.7 percent per year over those ten years. Initially higher rates of increase (expenditure was 7.6 percent up on the previous year in 1994, for example) were brought down to an annual average increase of 2.3 percent between 1996 and 2002 as a result of changes in the general rules and conditions governing health expenditure, including the 1996 Hospital Expenses Stabilization Act. Expenditure rose by only 0.9 percent in 2003 in the wake of the introduction of benefit-oriented reimbursement based on diagnosis-related flat rates per case (diagnosis-related groups) and the abandonment of the former principle of cost coverage. Furthermore, the development of expenditure reflects a concentration in the numbers of clinics and hospitals in Germany following new legislation (for more on this, see section 4.2.1 of this report on "Hospitals").

The high share of total expenditure on health caused by hospitals is related to the nature and seriousness of the illness treated and the corresponding personnel, medical and technical facilities that are needed. In 2003 about 34 percent of health expenditure (€21.8 billion) in hospitals was incurred by nursing and therapeutic care, and approx. 30 percent (€9.2 billion) by medical care. Nursing and therapeutic care contributed an above-average proportion of expenditure growth in hospitals (3.4 percent per annum compared to medical care with an increase of 2.7 percent per annum).

**Taken together, doctors' surgeries and pharmacies spend about as much as hospitals.** Health expenditure by doctors' surgeries totalled €32.5 billion in 2003; pharmacies' expenditure in the same year was €33 billion. The two expenditure rates have been converging over the last few years. The average expenditure growth rate for pharmacies (4.7 percent) was higher than that of doctors' surgeries (3.4 percent).

The single most important financial cost in medical practitioners' surgeries is that of medical services, which amounted to €22.8 billion in 2003. This was about 70 percent of surgeries' total expenses, which was slightly down on 2003/1993<sup>2</sup>. The reverse is the case for services connected with disease prevention, which cost practitioners' surgeries €2.6 billion in 2003, almost twice as much as ten years before.

The principle focus of health expenditure by pharmacies has always been the purchase of pharmaceutical products, on which they spent €32.2 billion in 2003; expenditure on therapeutic appliances was €800 million.

**Expenditure on ambulatory nursing care has increased since the introduction of long-term care insurance.** This expenditure has increased over the years, and the biggest share of it still goes to inpatient care establishments. Nursing-care provision cost a total of €23.6 billion in outpatient, inpatient and semi-inpatient nursing homes and hospitals in 2003, €10.1 billion more than ten years previously. 73 percent of this expenditure on nursing care (€17.2 billion) was spent on inpatient and semi-inpatient nursing care, 27 percent (€6.4 billion) on outpatient care.

During 1995 and 1996, when long-term care insurance was being phased in, the extension of available nursing provision that accompanied it caused a significant rise in the expenditure of nursing-care facilities, as had been anticipated. Expenditure on outpatient nursing care soared in 1995 by about 44 percent

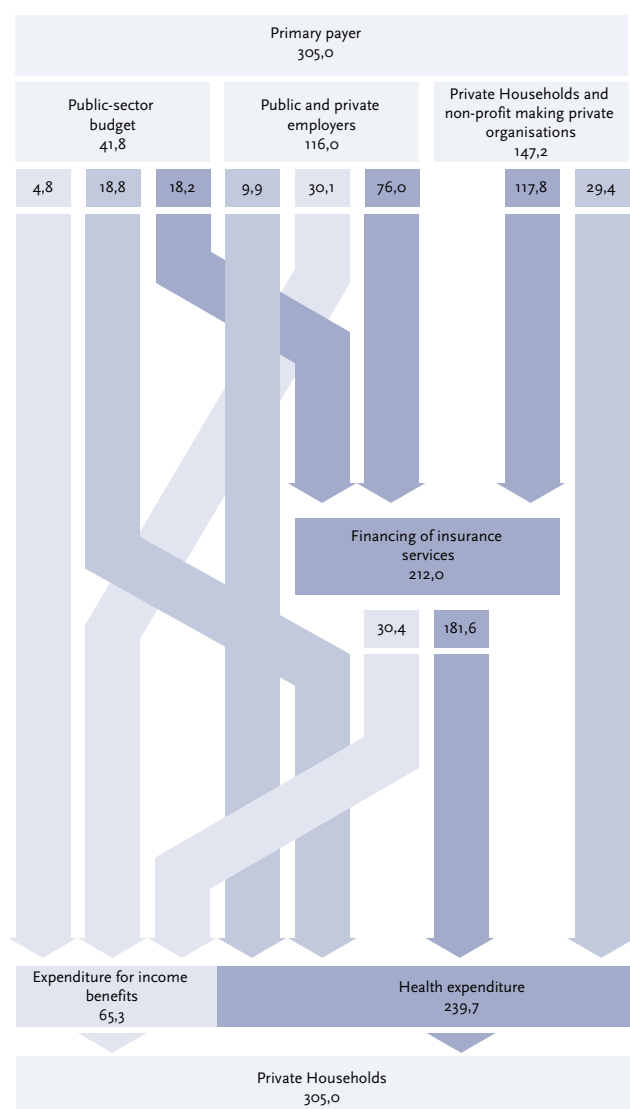


Figure 5.2: Financing flow in the German health care system 2003. Source: Federal Statistical Office 2005

over the previous year; expenditure on inpatient and semi-inpatient facilities in 1996 went up by about 10 percent. From then on until 2003 expenditure increased on average by three percent per year.

Nursing care is the main cost factor in nursing-care facilities, accounting for over 90 percent of outpatient nursing care costs and almost 76 percent of inpatient and semi-inpatient costs. Another highly significant cost factor here is accommodation and catering (20.3 percent), which of course are not relevant in outpatient costs.

**“Ambulatory before inpatient” also applies to health expenditure.** Expenditure on the entire range of ambulatory-care provision was €111.9 billion in 2003, 46.7 percent of all health expenditure. Along with doctors’ surgeries, pharmacies and the outpatient nursing-care facilities already mentioned, ambulatory facilities also include dental surgeries, other medical surgeries, facilities producing and testing small medical devices and the premises of a multitude of different kinds of health-care providers.

After a period of accelerated growth, the annual rise in expenditure on the whole field of ambulatory healthcare slowed appreciably between 1993 and 1996, and even more between 1997 and 2000. The background to this (as already mentioned) was the knock-on effect on costs of German reunification, the extension of the range of nursing-care provision that accompanied the introduction of statutory long-term care insurance, and modifications to the law on additional partial payment, co-payment regulations and reimbursement. The German government of the day revoked numerous regulations at the beginning of 1999. Together with new legislation and the targeted improvements in healthcare provision, this revived the growth rate of expenditure on ambulatory healthcare (leading to a 3.1 percent rise in 2003).

In 2003 inpatient healthcare generated total expenditure of €91 billion – 38 percent of all health expenditure. In addition to the hospitals mentioned above, inpatient healthcare facilities include inpatient and semi-inpatient nursing-care facilities, preventive-care facilities, rehabilitation centres, and occupational and social rehabilitation centres.

Expenditure on inpatient care rose less quickly than expenditure in the ambulatory sector over the same period, although the growth rates followed the same pattern. The annual growth rate was over five percent between 1993 and 1995, after which it fell continually. In 2003 expenditure on inpatient healthcare provision rose by just 1.1 percent over the previous year.

Between 1993 and 2003 healthcare expenditure on other healthcare facilities and private households also grew faster than average. The other healthcare facilities include taxi services performing ambulance services, and occupational-health services which ensure that employees receive certain kinds of healthcare provision. Private households are a “facility” in the healthcare system when they nurse family members at home and receive a nursing-care allowance. Expenditure on such facilities totalled €9.1 billion in 2003, an increase of almost €4 billion in ten years. Disproportionately large increases in expenditure were recorded during the years when statutory long-term care insurance was being phased in, as a result of the new nursing allowance payments (44 percent rise in 1995; 14 percent rise in 1996).

## 5.2 Financial flows

### ► Abstract

In Germany, private households and charitable and non-profit organizations bear a major share of the financial healthcare burden. In 2003 they bore 48.3 percent of €305 billion spent in that year on healthcare services and health-related benefit payments. The employer's contribution was the second largest share of expenditure (38 percent); the public sector bore 13.7 percent of the total.

€212 billion of the total of €305 billion was made up of contributions and subsidies to statutory social insurance and private health insurers; €58.1 billion came from direct purchases and co-payments, and the remaining 34.9 billion was paid directly by the public sector and employers to private households, for example in the form of salary continuation payments.

The financial burden on the public sector has lessened since 1993, but for private households and charitable and non-profit making organizations it has increased markedly. The employer's share has fallen as a percentage of total expenditure.

**Private households and organizations bear the biggest financial burden.** The financing of the German healthcare system is organized in several stages and involves a number of different participants with different roles. Basically, the funding comes from three sources: from private households and charitable and non-profit making organizations (for example: unions, churches or parties); from private and public-sector employers; from the public sector (for example: social welfare authorities) (see Figure 5.2).

In 2003 these so-called primary financers spent a total of €305 billion on health and health-related benefit payments: 48.3 percent of this total came from private households and charitable and non-profit making organizations, 38 percent from employers and 13.7 percent from the public sector.

€212 billion of the €305 billion provided by the three primary financers came in the form of contributions and additional benefits to the social insurance carriers (statutory health insurance, statutory pension insurance, statutory accident insurance, and statutory long-term care insurance) and private health insurers. The social insurance carriers and private insurers spent €181.6 billion of this €212 billion on healthcare provision. The remaining €30.4 billion was paid out as health-related benefit payments to private households, for example in the form of sick pay or early-retirement payments.

**Direct purchases and co-payments constitute almost a fifth of expenditure on health and health-related benefit payments.**

A not-insignificant proportion of the funding comes into the healthcare system without the mediation of insurance companies or health insurance funds: 58.1 percent of the total €305 billion comes from the primary financers for direct purchases of health production and services and additional benefit pay-

ments. A further €34.9 billion is paid directly by employers and the public sector to private households, for example in the form of salary continuation payments.

**The financial burden on the public sector was lightened in the 1990s.** Since the early 1990s, the financial structure of the healthcare system has evolved in a way favourable for the public sector, while the financial share borne by private households and private charities and non-profit organizations has risen. The public sector bore 19 percent of total costs (€43.8 billion) in 1993, but this share had fallen to 14 percent (€41.8 billion) by 2003. By contrast, the financial share borne by private households and charitable and non-profit making organizations rose from about 41 to 48 percent. They spent a total of €147.2 billion in 2003, €52.9 billion more than in 1993. Expenditure by employers went up by about half this rate, so that their share of total expenditure has actually fallen. Among other things this is attributable to the falling number of days lost to sickness. As a result there has been little change in their health-related benefit payment costs.

Part of the shift in the shares of expenditure is related to the introduction of mandatory long-term care insurance, a move that greatly reduced the financial burden on the public sector: its health expenditure fell from €22.7 billion to €18.8 billion between 1993 and 2003. Over the same period, private households' expenditure on health and that of charitable and non-profit organizations rose by €11 billion to €29.4 billion. Employers' health expenditure went up by €2.5 billion to €9.9 billion in 2003.

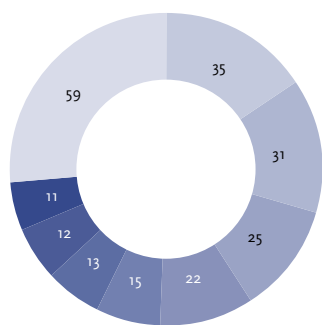
### Note on methodology

A decisive factor in the analysis of financial flows in the healthcare system is: who bears the costs of healthcare and health-related benefit payments and to what extent? Three parties bear the economic burden of healthcare: private households and charitable and non-profit organizations, the public sector, and the employer.

These parties are also called the primary financers.

Social insurance carriers and private health-care insurers, which play an important role in the itemization of health expenditure, are themselves financed by the above-named primary financers and are of secondary importance when it comes to financial flows. They only play a mediating function from the perspective of

health expenditure, passing on social and public-welfare benefits to the care provider. As far as the presentation of financial flows is concerned, the expenditure of the social insurance carriers and private health insurers is regarded as part of the expenditure of private households and organizations, the public sector and employers.



- Other
- IX. Cardiovascular diseases
- XI. Digestive tract diseases
- XIII. Diseases of the muscular and skeletal system
- V. Psychological and behavioural disorders
- II. Neoplasms
- IV. Endocrine, nutrition and metabolic disorders
- X. Respiratory diseases
- XIX. Injuries and intoxication

Rem.: The Roman numeral indicate the classification of diseases according to ICD-10

Figure 5.3.1: Disease costs in billion Euros (2002) by selected disease classes. Source: Federal Statistical Office 2004

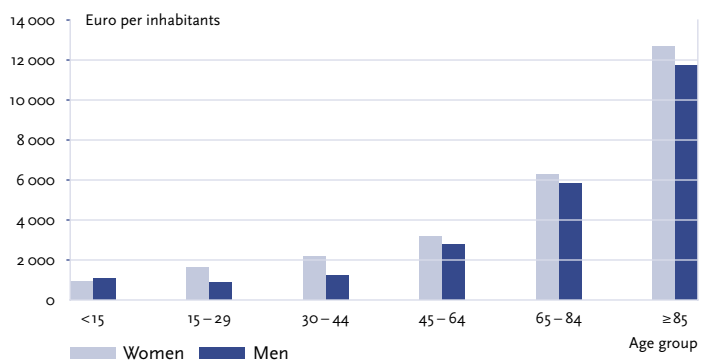


Figure 5.3.2: Costs of illness in Euro per inhabitant 2002, by sex and age. Source: Federal Statistical Office 2004

## 5.3 The costs of illness

### ► Abstract

**Cardiovascular diseases were the most expensive group of illnesses in Germany in 2002, generating expenditure amounting to €35.4 billion. Almost one euro in six spent on healthcare provision was spent on cardiovascular diseases: expenditure on digestive diseases, including dental treatment and prostheses, ranked second (€31.1 billion). Muscular skeletal and connective tissue diseases was in third place (€26.2 billion), just ahead of mental disorders (€22.4 billion).**

**The costs of illness rise with a person's age and when the proportion of elderly people in the population increases. In 2002, 43 percent of total costs were incurred by the over-65 age group. Per capita expenditure is 1.4 times higher on women than on men, a fact that can be principally attributed to their higher life expectancy, the costs of pregnancy and birth, and the fact that the distribution of some diseases is gender-specific.**

### 5.3.1 The costs of illness by illness type

#### **Cardiovascular diseases are the most expensive type of illness.**

The total cost of illness in Germany was about €223.6 billion in 2002. The most expensive of all were diseases connected with the circulatory system; the total costs here amounted to €35.4 billion. Almost every sixth euro spent on healthcare provision in Germany was spent on cardiovascular diseases (see Figure 5.3.1). In detail, high blood pressure (hypertony/hypertension) accounted for €8.1 billion, cerebrovascular diseases such as strokes for €7.8 billion, and ischemic heart diseases such as cardiac infarction for €7 billion. Cardiac insufficiency (weak heart) caused costs of €2.7 billion.

Diseases of the digestive system ranked second after cardiovascular complaints, accounting for 13.9 percent of total costs (€31.1 billion). Much of this money (€20.2 billion) was spent on diseases of the oral cavities, salivary glands and jaws; these notably include dental treatment and prostheses.

#### **Back pains and arthrosis together cost more than €15 billion.**

Diseases of the musculoskeletal system and connective tissue ranked third in the statistics for 2002 (€25.2 billion), accounting for 11.3 percent of total expenditure. Back disorders (dorsoopathies) cost €8.4 billion, arthroses €7.2 billion.

#### Definition

Costs of illness are defined as expenditure incurred by measures directly linked to medical treatment, cures, prevention, rehabilitation and nursing, including all administrative costs. Non-medical expenses – e.g. private transport to see a doctor or unpaid nursing care performed by relatives – are ignored.

Costs of illness are categorized according to illness, age, gender and healthcare facilities. This enables conclusions to be drawn on the economic significance of particular complaints, or the influence of demographic shifts on the pattern of expenditure.

Costs of illness correspond to the so-called running costs of health, which are about €10 billion lower than total health expenditure. Total health expenditure also includes training and research costs as well as investment in the health sector. Because these are costs in advance of application, they do not count as running costs of health. It is not possible to analyse trends in the costs of illness, since to date relevant data is only available for the year 2002.

Mental and behavioural disorders ranked fourth, with expenditure amounting to €22.4 billion, or 10 percent of the total. Along with dementia (€5.6 billion) and depression (€4 billion) these include neurotic, stress and somatoform disorders (€2.8 billion).

In 2002 neoplasms (tumours) were responsible for 14.7 percent (€14.7 billion) of costs, 6.6 percent of total expenditure. Malignant neoplasms of the digestive organs generated expenses totalling €2.8 billion, the mammary glands €1.6 billion, the prostate gland €1.2 billion, the trachea, bronchia and lungs €1.1 billion.

The costs of endocrine, nutritional and metabolic diseases amounted to €12.9 billion in 2002, or 5.8 percent of the total costs of illness. Diabetes was a particularly significant cost factor, accounting for two-fifths of the expenditure on dietary and metabolic disorders.

Infectious and parasitic diseases were of minor financial relevance, generating total costs of €3.8 billion in 2002.

### 5.3.2 The costs of illness by age and gender

#### **Costs of illness rise with age.**

In 2002 the average per capita cost of illness was €2,710. Expenditure on younger people was appreciably lower than on the elderly (see Figure 5.3.2). The average per capita expenditure on people under the age of 45 was only €1,700; for the 45–65 age group it rose to €3,000, while the per capita cost of the over 65s jumped to €6000.

The costs of illness also vary according to gender. In 2002 per capita expenditure on women was €3,160, on men €2,240, i.e. the costs of illness are 1.4 times higher on average for women than for men.

#### **A longer life expectancy, pregnancy and birth cause the higher average expenditure on women.**

There are several reasons for the difference. One highly significant factor is that women live longer on average [4], so that the proportion of women is higher among older people, who in turn cause higher costs. Women made up 51.1 percent of the total German population in 2002. Yet in the same year 60.5 percent of the 65–85 age group and as many as 76.1 percent of the over-85s were women.

With the exception of young people under 15, the costs of illness are consistently higher in the case of women than for men. The gender differences are especially striking in the 15–30 and 30–35 age groups. Here, the gender difference can be partially explained by the cost of healthcare services for women in connection with pregnancy and birth, artificial insemination and prescriptions for contraceptives. Furthermore, women are entitled to free cancer screening from the age of 20, men only from the age of 45. Another factor is that certain complaints, such as urinary tract infections, occur much more frequently among young women than among men, so that such complaints in women cause correspondingly high costs.

Excluding from the costs of illness all expenditure that can be accounted for by women's higher life expectancy, expenses linked to pregnancy and birth, and the higher rates of gender-specific illnesses, there is hardly any difference between the average expenditure on men and women [5].

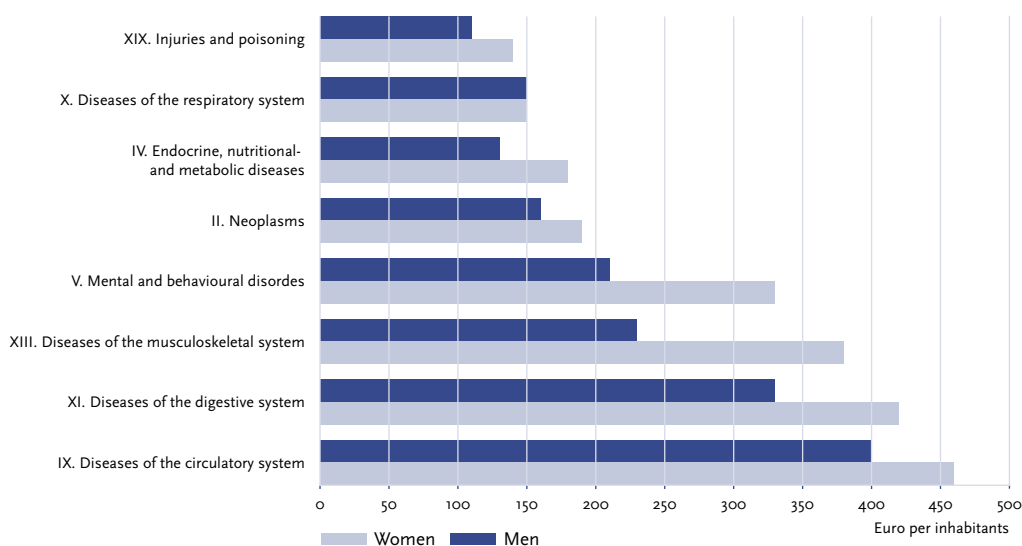
#### **Orthopaedic and mental disorders are a significant cost factor among elderly women.**

Some complaints are characterized by particularly marked differences in the costs of illness between men and women (see Figure 5.3.3). Annual per capita expenditure on muscular skeletal diseases is 1.7 times higher, and

spending on mental and behavioural disorders 1.5 times higher among women than men.

Indications as to the cause of this difference in costs can be found in age-specific differences: two-fifths of the expenditure on muscular skeletal diseases and mental and behavioural disorders are incurred by people over 65 years of age, and of that expenditure 73 percent is on women.

One reason for this is that on average elderly women are more likely to be living alone and therefore have to be looked after in an inpatient or semi-inpatient institution, which is correspondingly cost intensive. An additional factor is that some typical female illnesses, such as bone disease, are also characteristic of old age.



ARem.: The Roman numeral indicate the classification of diseases according to ICD-10

**Figure 5.3.3:** Costs of illness 2002 in Euro per inhabitant, by selected disease classes and sex. Source: Costs of disease calculation of the Federal Statistical Office 2004

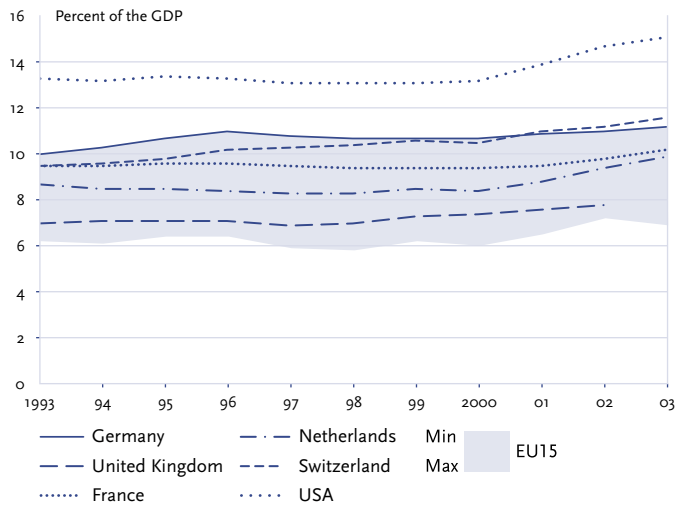


Figure 5.4.1: Development of health expenditure (in percentage of GDP). Source: OECD Health Data 2005

## 5.4 Health expenditure: an international comparison

### ► Abstract

Total expenditure on health in Germany was the equivalent of 11.1 percent of GDP in 2003. Only in the USA and Switzerland are the figures higher; they were appreciably lower in most European countries.

In Germany, as in other countries, expenditure on health grew more rapidly than the overall economy between 2001 and 2003. The main reasons for the upward trend are medical and technical advances in treatment methods, a rising number of elderly people in the population, and an increase in volume and prices in the provision of healthcare services. Per capita expenditure on health also went up, although more slowly in Germany than in other industrialized countries. Nevertheless, Germany was also in the upper middle group when it came to this comparison criterion.

### 5.4.1 Health expenditure as a proportion of gross domestic product (GDP)

**Health spending makes up an increasing proportion of economic output.** Health expenditure accounted for 11.1 percent of GDP in 2003, a high figure by international standards (see Figure 5.4.1). Only in the USA was the figure significantly higher (15 percent). At 11.5 percent, the proportion for Switzerland was more or less the same as that for Germany. The percentage of GDP spent on health in other countries is below the figure in Germany. Of the countries included here, the United Kingdom had the lowest figure at 7.7 percent in 2002. When evaluating the GDP percentages, it should be borne in mind that the increase in health expenditure has been relatively moderate in Germany over the last few years; there have also been notable improvements in efficiency in the healthcare sector. Nevertheless, the GDP percentage has continued to rise as the general economic situation has been less favourable than in other countries.

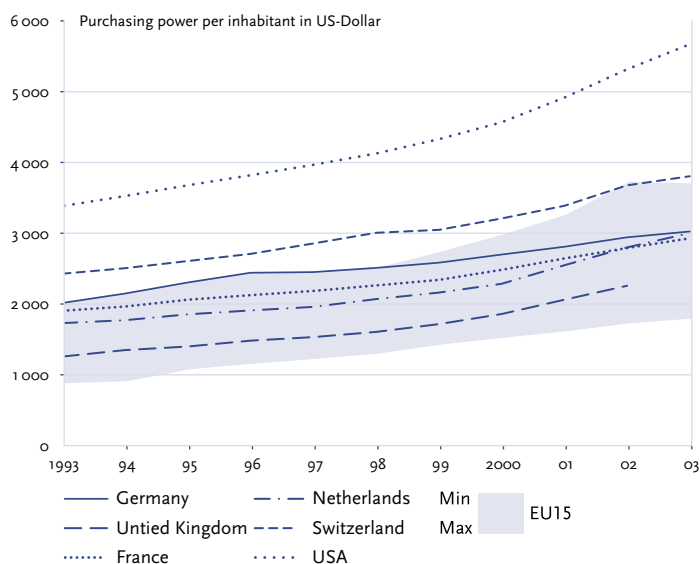
Healthcare policy in all the OECD countries is focused on improving the quality of the respective healthcare system and bringing health costs into line with economic development, bearing in mind socio-political considerations.

#### Note on methodology

The international comparison of healthcare expenditure is based on data from the Organization for Economic Cooperation and Development (OECD). The defining parameters of healthcare expenditure sometimes differ from those used in Germany, which explains why the figures cited in the previous sections of this report diverge slightly from the OECD results; health-related benefit payments as well as research and development are therefore not taken into account in these international comparisons.

To provide an easy overview, the comparison has been confined to Germany, France, the Netherlands, Switzerland, the UK and the USA. First, these countries lend themselves to a comparison because the figures they provide follow the OECD model, the “System of Health Accounts”, so that we can work on the assumption that the data are suitable for statistical comparisons. Second, the countries represent a range of healthcare systems that are the subject of scrutiny and consideration in political debate here in Germany.

Two key indicators are used in the international comparison: health expenditure as a percentage of GDP and per capita health expenditure. The first figure indicates the percentage of domestically produced goods and services attributable to the healthcare system. The second excludes the effect of the country’s population size and is adjusted for purchasing power parity, national price indices and exchange-rate fluctuations.



**Figure 5.4.2:** Development of health expenditure (in US-\$ purchasing power parity per inhabitant). Source: OECD Health Data 2005

## 5.4.2 Per capita health expenditure

**Per capita expenditure is rising more slowly in Germany than elsewhere.** Per capita expenditure on health has risen over the past few years in all the countries included in this study, with prices adjusted to take differences in purchasing power into account (see Figure 5.4.2). In the USA, the PPP-adjusted per capita expenditure (PPP = purchasing power parity) was \$5,600 in 2003, in Switzerland \$3,780; the Germans invested just under \$3,000 in their health. Looking at the per capita expenditure between 1993 and 2003 in all the countries selected, Germany's average rise over that period is actually the lowest, notwithstanding the increased proportion of GDP spent on health. This indicates greater efficiency gains than in other countries.

Germany's high rate of healthcare expenditure can be traced to its comprehensive provision of medical care for the whole population (with short waiting lists), an extensive schedule of benefits, and a high density of medical practitioners and medical facilities.

Quite clearly there is not necessarily correlation between the level of per capita health expenditure and the fundamentally different ways of financing healthcare expenditure, which the healthcare systems in this study bring to light (USA: a free-market system with a growing proportion of public funding and a large number of people (about 45 million) with no access to healthcare; Switzerland: an individual flat-rate premium combined with a system of tax benefits and comprehensive insurance coverage of the population; Germany: a social insurance system with free-market aspects, a limited degree of tax benefits and comprehensive coverage of the population; the UK: an income-tax-funded national health system for the whole population, involving explicit rationing of healthcare provision). General access to medical care services, the range of medical care services available, and both the density and quality of medical provision all have a major impact on levels of healthcare expenditure [7].



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**Key statements**

- ▶ The federal government's Commissioner for Patients' Affairs represents the interests of patients at the national level. (Page 203)
- ▶ The Patients' Charter provides an overview of patients' rights and duties in Germany as laid down by law. (Page 203)
- ▶ Representatives of patients and the general public have the right to participate in the consultations of the Federal Joint Committee and numerous other committees of the German healthcare system; sometimes they have a right to vote. (Page 205)
- ▶ At least 80 percent of Germans want to be able to decide on their health treatment together with their doctor; just under 45 percent believe that this is what happens. (Page 205)
- ▶ Patient participation contributes to successful therapy, e.g. in cases of chronic pain, psychiatric disturbances, diabetes, rheumatism or head injuries. (Page 205)
- ▶ About half of Germans feel they are not well-enough informed to be able to choose the best doctor or hospital when they are taken ill. (Page 207)
- ▶ Three quarters of statutory health-insurance members believe that the health insurance funds ought to be monitoring the quality of treatment that doctors provide. (Page 207)
- ▶ There are an estimated 70,000 to 100,000 self-help groups in Germany; it is estimated that their achievements as advisers save the German national economy up to € 2 billion a year. (Page 211)

## 6 How can patients be informed and take part in decision-making?

### ► *Abstract*

The active involvement of patients in the shaping of healthcare provisions is on the increase, both in Germany and internationally. Important parties to this are patient organizations and independent advice centres. The first steps have already been taken to give a legal structure to the work of those involved. The aim of such efforts is to ensure that patients' wishes and interests are more carefully considered, and that there is more transparency and economic efficiency in the healthcare system.

It cannot yet be said with any degree of certainty to what extent these steps will prove successful. Patient organizations and independent patient-advice centres need financial resources and qualified personnel to hold their own when facing well-organized negotiating partners with expert knowledge and many

years of experience in negotiating and reaching agreements on health matters.

Even though there is a diversity of information centres for patients and consumers, comparative information on the quality of treatment in different facilities is scarce.

If the focus is on the interests of the patients and the population in general, this should help people with health problems to make sure they are treated in the right place and receive effective treatment which is not undignified and reflects their own wishes. Since health disadvantages are often linked to social problems, this aim can only be achieved if the circumstances and conditions of the affected person's life are taken into account in their healthcare provision. It is equally important to increase the number of easily accessible local health-support facilities.

## 6.1 The overall political and legal framework

### ► *Abstract*

For years, patient representatives, experts and health-policymakers have called for improved opportunities for patients' involvement in the shaping of healthcare provision. The basic idea is that this would improve transparency in the health system, make it more economical, help to prevent unnecessary treatment and medical malpractice, and reinforce patients' rights.

Individual patients' rights include the right to make one's own decisions, the right to explanation and clarification, a right to good-quality and well-organized treatment, the right to see one's own health records and the right to confidentiality of one's personal data. However, the various relevant rights are covered by different regulations and laws. To date Germany has no standardized law applying to patients' protection as a specific issue that brings all the relevant legal norms together and gives them a unified written and legal structure. There is the so-called Patients' Charter, drawn up in 2003, an information charter presented by the representatives of the interested parties in the healthcare system, which provides a general overview of the current rights and duties of patients and medical staff.

The current organization of healthcare provision is laid down in the German Social Security Code. The Health Service Reform Act included regulations on the funding of patient and consumer associations by the health insurance funds. Since 2004 patients' interests have been represented by the federal government's Commissioner for Patients' Affairs. Furthermore, patients' and consumers' associations participate in a consultative capacity in the decisions of the Federal Joint Committee. This is where the representatives of doctors, health insurance funds and hospitals work together to determine which diagnostic methods and medical treatments are to be included in the schedule of benefits of the statutory health insurers, and covered by them in their policies.

*The doctor-patient relationship is turning into an active partnership.* The aim is that citizens should be able to play a bigger role in helping to shape healthcare provision in the future. This applies equally to the direction in which health policy should develop and decision-making on medical therapy in specific instances. Blind trust in doctors is gradually giving way to a mutually aware and informed relationship between doctor and patient, a relationship that is in the interests of successful therapy. The aim is to replace a well-meaning paternalistic or even patronising relationship with an active relationship of equals.

The debate was sparked off in Germany by a resolution of the German Regional Health Ministers' Conference (GMK) in 1996 and the recommendations of the 7th Regional Health Conference of North Rhine-Westphalia in 1998. The Advisory Council on the Assessment of Developments in the Healthcare System (SVR) has been speaking out over the last few years about the need for a more citizen- and patient-oriented approach [1, 2]. This is part of the idea of preventing or rectifying detrimental trends in the healthcare system and adjusting healthcare provision to the needs, preferences and expected standards of those affected, as well as raising the popular acceptance level of health-policy decisions. This is a demand that has been raised in various experts' reports [1–5] and representative surveys and by consumers' and patients' interest groups.

According to the Advisory Council on the Assessment of Developments in the Healthcare System, the knowledge and

participation of patients can have a considerable influence on the quality of the care provided, as well as on the financial efficiency of the healthcare system [1]. What is required to achieve all this is information, transparent care provision and structures in the healthcare system, as well as easier and comprehensive access to all available support.

In recent years the German Ministry of Health (BMG) has created the general initial conditions for reaching this goal in terms of policy and law with the active participation of several self-governing bodies (health insurance funds, the Association of Statutory Health Insurance Physicians, the Association of Sick Fund Dentists, hospital associations). The process is maintained with funding from initiatives, programmes and projects, including the funding programme for pilot projects focusing on the role of patients as partners in the medical decision-making process in various healthcare environments [6].

Other initiatives include an addition to the German Social Code, section 65b (SGB V), on support for consumers' and patients' advice and liaison services, strengthening patient autonomy and health literacy within the framework of the national programme known as "gesundheitsziele.de", and, last but not least, the extension of patients' collective rights.

**Patients have a right to autonomy, good treatment and access to their own health records.** The organization of healthcare provision is laid down in the German Social Security Code (SGB) [7]. Individual patients' rights in Germany are incorporated in various sections of the law based on Germany's Basic Law (constitution) guaranteeing the right to life, freedom from bodily harm and self-determination.

Four areas of law can be distinguished in the field of patients' rights: rights to autonomy (guarantee of self-determination based on access to information, explanation and advice), rights to quality standards (guarantee of the quality of healthcare), rights to information (guarantee of access to medical treatment records, confidentiality of personal medical data), and rights to organization (guarantee that treatment is competently organized) [8].

Patients' rights are currently taken into account in constitutional, civil, social-insurance, pharmaceutical, competition, penal and professional law. To date, however, there is no patient protection act combining all the legal regulations and giving them a unified structure; experts and patients' representatives are constantly demanding such a structure.

**The Patients' Charter summarizes all existing patients' rights.** The information charter entitled "Patients' Rights in Germany" was published in 2003 to reinforce patients' rights [9]. It was created by patients' representatives, representatives of self-help groups, the medical profession, clinics and hospitals, health insurers, data protection associations and the federal states under the auspices of the former BMGS (Federal Ministry of Health and Social Security). The Patients' Charter summarizes the current rights and duties of patients and medical staff with the aim of making patients aware of their rights and enabling them to participate in the treatment process, as well as providing orientation guidelines to doctors and others active in healthcare-related professions on how they can support their clientele.

Since the introduction of the Social Health Insurance (SHI) Modernization Act, passed in January 2004, patients' interests have been represented by a Commissioner for Patients' Affairs in the federal government. S/he intervenes on behalf of patients and is responsible for ensuring that the patient-related aspects of the SHI Modernization Act do not fall short of their aim.

**Patient organizations are to take part in decisions on the schedule of SHI benefits.** Leading patient organizations named in the Ordinance on Patient Participation [10] have been given consultation rights and the right to file applications to the Federal Joint Committee, one of the most important decision-making bodies in the German healthcare system. In its capacity as representative of the medical profession, SHI funds, clinics and hospitals, this body's task is to decide which diagnostic and treatment methods will be included into the SHI schedule of benefits and covered by them in their policies.

An important target is to manage patients' complaints systematically to help prevent unnecessary, ineffective or mistaken practices and to reduce the number of medical errors. Such errors are especially likely to occur as a result of organizational weaknesses, poor documentation or inadequate or incorrect therapy, or if therapy is conducted using inappropriate or inadequate facilities [11]. Knowledge and experience on the part of the patients themselves is crucial in the prevention of medical malpractice.

The Institute for Quality and Economic Efficiency in the Health System (an independent body founded by the Federal Joint Committee) deals with questions (pursuant to section 139a of the SGB V) of fundamental importance to healthcare performed within the scope of statutory health insurance. Especially important aspects of the institute's role include the following: investigating, presenting and evaluating the medical state of the art in the diagnosis and therapy of selected diseases; drawing up scientific reports and opinions; evaluating professional therapy guidelines; submitting recommendations on disease-management programmes; evaluating the effectiveness of pharmaceutical products; and preparing general, easy-to-understand information on quality and efficiency in healthcare provision.

The Institute publishes reports on its results at regular intervals, giving the leading patient organizations and the federal government's Commissioner for Patients' Affairs an opportunity to make comments. Patients can also file applications to the Federal Joint Committee asking for the institute to be instructed to clarify specific questions (see also section 4.3).

Institution	Committee	Listening	Advice	Decision
BMG	German forum Prevention			■
BMG / GVG	gesundheitsziele.de			■
BMG	Commission Off Label Use			■
DIMDI	HTA – Board of Trustees			■
RKI	GBE – Commission			■
BfARM	Graduated plan procedure § 63 AMG		■	
BfR	Committee on the Detection and Treatment of Acute Poisonings ChemG		■	
IfA	IfA Positive list	■		
German federal states	Health conferences			■
Local authorities	Health conferences			■
Joint self-government of doctors and health insurance funds at national level	Federal Joint Commission § 91 SGB V		■	
	Advisory board of Association for Health Care Data Transparency § 303b SGB V		■	
Joint self-government of doctors and health insurance funds at regional level	Regional committees § 90 SGB V		■	
	Accreditation committees § 96 SGB V		■	
	Appeal committees		■	
German Medical Association / KBV	Patients' forum			■
Regional medical associations Research institutions	Ethics commission			(■)
Regional medical associations	Panel of experts/arbitration boards			(■)
IQWiG	Board of Trustees	■	■	
Gematik	Advisory council	■		

BMG: Federal Ministry of Health  
 DIMDI: German Institute for Medical Documentation and Information  
 RKI: Robert Koch Institute  
 BfARM: Federal Institute for Pharmaceuticals and Medical Products  
 BfR: Federal Institute for Risk Assessment  
 IfA: Institute for the Prescription of Pharmaceuticals in the Statutory Health Insurance System  
 IQWiG: Institute for Quality and Economic Efficiency in the Health System  
 Gematik: Society for Telemedical Applications of the Health Card mbH  
 HTA: Health Technology Assessment  
 GBE: Health Monitoring  
 AMG: Pharmaceuticals Act  
 ChemG: Chemicals Act

■ = already full or (■) = opportunities for participation existing in part

**Table 6.2.1:** Continuous participation of patients' representatives on various committees of the German health care system

Institution	Agreements and requirements during the modification, revision, or repealing of which patients' representatives are accorded a hearing	Hearings/ Statement of Position	Advising	Decision
German Parliament (Bundestag)	diverse	■		
Ministries	diverse	■		
Leading Associations of Statutory Health Insurance Funds As per SGB V	Self-help promotion § 20 (4)		■	
	General agreements Preventive measures against dental diseases (Group prophylaxis) § 21 (2)		■	
	Fixed contributions: medical aids § 36 (1,2)		■	
	General recommendations: health care and rehabilitation measures § 111b		■	
	Two page contracts and general recommendations about treatment in hospital § 112		■	
	General recommendations about three page contracts and general recommendations between health insurance funds, hospitals and SHI doctors § 115		■	
	Recommendation on including therapeutic remedies as a service § 124 (4)		■	
	General recommendations regarding standard cure provision § 125 (1)		■	
	Recommendations regarding a standard procedure for granting licences as per § 126 (2)		■	
	List of therapeutic aids § 128		■	
Structured programme of treatment in the case of chronic diseases § 137f	■			

**Table 6.2.2:** Ad hoc participation of patients' representatives during hearings, statements of position and advising on various aspects of health care provision

## 6.2 Opportunities to participate in the healthcare system

### ► Abstract

**Citizens, as well as patients, sit on a variety of different committees in the German healthcare system where they have consultation rights and, less often, voting rights.**

**One of the most important decision-making bodies in which ordinary members of the public participate is the Federal Joint Committee, which decides on what is to be included in the statutory health insurance funds' schedule of benefits. At present, representatives of the following groups enjoy consultation rights and the right to file applications to the Federal Joint Committee: the German Disability Council, the Federation of German Consumer Organizations, the Federal Association of Patient-information centres and Initiatives, and the German Association of Self-Help Groups.**

**Ordinary members of the public, as well as patients, are also represented on health insurance fund committees and regional conferences on healthcare, although in these cases the lack of financial resources and staff makes it more difficult to pursue patients' interests.**

**Over 80 percent of Germans want to make joint decisions with their doctor about their treatment. However, only about 45 percent believe that this is what actually happens. Various studies have shown that the chances that a treatment will succeed – and that unnecessary treatment can be avoided – will improve if the person affected is properly informed and involved in the decision-making process; this is especially likely to be the case where chronic disease is concerned.**

### 6.2.1 Involvement in individual healthcare decisions

**The great majority of Germans want to play an active role in their relationship with their doctor.** Customers of the healthcare system want to be reliably informed and treated as an equal partner by specialists and others involved in decisions about their health. This applies more or less equally to healthy and sick people, as well as to both chronic and acute patients. In particular, the desire to be regarded as a partner in the proceedings is shared by patients regardless of the nature of their illness [7].

According to a European comparative study, more than 80 percent of German citizens would like to be actively involved in decision-making processes in relations between doctor and patient: just under 45 percent consider that this is already happening. There is no difference between men and women in this respect, but interest does tend to wane with advancing age [12].

**Patient involvement can improve the success rate of treatment and reduce costs.** Appropriate patient involvement not only makes it easier for them to cope with an illness and raise their quality of life, it also reduces the demand for unnecessary medical care, which in turn prevents unnecessary costs or cost increases.

Various studies have shown that better therapeutic results are achieved in the case of chronic pain, chronic mental disorders, diabetes, rheumatism and head injuries, when those affected are properly informed and involved in the decision-making process [13]. A shared decision-making model is especially beneficial. It is a way of reaching decisions through a partnership in which special emphasis is placed on understanding

the needs of patients in their totality, explaining the opportunities and risks of alternative treatments, and giving patients an opportunity to bring their own priorities, values and preferences into the decision-making process [14, 15].

This approach is served by the electronic health card (launch date 2006), which is being introduced in stages in Germany to eventually replace the existing health-insurance card. Patients will have access to their medical data via this card, so that they can better understand decisions about their medical treatment and play a part in shaping them.

### 6.2.2 Participation in collective decisions on healthcare

**Members of the general public as well as patients are represented on a variety of committees, mostly in a consultative capacity.**

The interests of ordinary members of the public, insured people and patients should be taken into account when decisions are made on healthcare, by making sure they are represented as individuals or as group or association delegates [8]. The Social Health Insurance Modernization Act for the first time laid down a collective legal right of patients' representatives to participate. Under the Act representatives of patients' interests have an advisory vote on various committees. These include the Federal Joint Committee and its subcommittees (section 91 of the SGB V); the Association for Healthcare Data Transparency (section 303b of the SGB V); federal state committees (section 90 of the SGB V); the Accreditation Committees (section 96 of the SGB V); and appeals committees at federal state level (section 97 of the SGB V). In addition, patients' representatives are involved in the decisions made by the national confederations of regional SHI associations, for example when decisions are made on the Medical Aid Directory or on fixed rates for medication.

There are various stages of collective participation that need to be distinguished. Citizens can express their opinions via opinion polls (stage 1), can participate in hearings and statements (stage 2), take part in consultation procedures (stage 3), and finally they have a right to vote on decisions (stage 4).

At present, different forms of involvement have become established on different committees (see Tables 6.2.1 and 6.2.2).

**The most influential committee with citizen participation is the Federal Joint Committee.** It is one of the most important decision-making bodies in the German healthcare system, bringing together representatives of the medical profession, health insurance funds, clinics and hospitals. It decides, for instance, which therapies are to be covered by statutory health insurance. At present representatives of the leading patients' organizations participate in an advisory capacity in the Federal Joint Committee (and at state level in the regional appeal and accreditation committees). These organizations are the German Disability Council, the Federation of German Consumer Organizations, the Federal Alliance of Patient Centres and Initiatives, and the German Association of Self-Help Groups.

The German Council for the Disabled is an alliance of the leading organizations representing the chronically ill and disabled; the other three are umbrella organizations offering both support and advisory services.

On all the committees at both national and local level, most of the people representing patients who are directly affected. Sufficiently competent people have a right to consultation if not to co-determination [10]. Patient participation on the Joint Federal Committee is intended to ensure more transparency in its

resolutions and to focus more attention on the interests of those affected with respect to their age, gender, living conditions and personal circumstances.

The organizations taking part gave a generally positive assessment of their first year of participation on the Joint Committee. Although the patients' representatives failed to win acceptance for their point of view on some issues, on others their participation clearly modified the committee's resolutions in the patients interests [16].

At present it is still too early to assess the effect that the participation of patients' representatives will have on the actions and conclusions of the Federal Joint Committee.

**Patients' representatives also participate in committee meetings of the insurance funds.** Insured people are represented in the statutory health-insurance institutions (and have been for years) through the elections to their governing boards (the tenth election was held in 2005). However, participation in the elections to the governing boards of the social security institutions is not very high. For this reason, the Regional Health Ministers' Conference proposed in 1996 that patients' representatives should be co-opted onto the relevant committees regardless of the elections. On the other hand, the opportunity to participate in the work of the professional chambers and corporate bodies of public medical care is problematic, both legally and with regard to regulatory procedures.

The German Medical Association actively involves patients' representatives in the preparation and adoption of guidelines for medical practice. A formal partnership has been in existence between the Federal Working Group on Help for the Disabled, the Parity Welfare Association and the National Medical Committee for Quality Assurance (ÄZQ) since March 2001. This partnership works together selecting, certifying and distributing medical information via the following Internet address [www.patienteninformation.de](http://www.patienteninformation.de).

Many care-service providers in the health system consult patients on their views, if only through general or patient opinion polls (stage 1 of participation). Patient surveys are a standard element of quality management in many clinics and hospitals. Interest in quality assurance has been growing continuously since the early 1990s and the patient's perspective has always been considered an indispensable part of this (see also Chapter 4.3).

**Healthcare conferences support citizens' interests at regional and local-council levels.** Members of the public, insured people and patients can take part in the shaping of healthcare provision at the level of council policymaking or in so-called healthcare conferences [17]. Patients' representatives rate these opportunities very highly, but also feel that the financial resources and staff available are inadequate to pursue patients' interests effectively. They also argue that there has to be an improvement in the way information is exchanged between local-council healthcare conferences, their respective working groups and citizens [18]. They say that more attention should be paid to gender balance among participants. In North Rhine-Westphalia there is now a platform (Patient Network North Rhine-Westphalia [19]) where the representatives of patient and self-help organizations can exchange ideas and offer mutual support.

**Promoting patient sovereignty and participation should be health-policy aims.** The "gesundheitsziele.de" pilot project is an initiative launched in December 2000 with the support of the former Federal Ministry of Health and Social Security in which politicians, the medical profession, hospitals, health insurance funds and patient and self-help organizations coop-

erate with each other; its health policy aims include the promotion of patient sovereignty and competence in health matters. The specific aims are that the healthcare system become more transparent, patient rights reinforced and complaints management improved [20]. Processes have also been set in motion to put these aims into practice; specific responsibilities have been defined and agreement reached on the regular monitoring of the processes in question [21]. The relevant measures have already been adopted and are currently being put into practice.



## 6.3 Sources of information and advice

### ► Abstract

The amount of information and advice available in the German healthcare system has been growing continually over the last few decades. Providers of advice and information include medical associations, clinics and hospitals, consumer advice centres, patient-information centres and self-help groups.

The most important advisors for the majority of patients are doctors, but there is a growing desire to be better informed in general. In hospitals, patients' spokespersons assume the role of ombudsmen. About three quarters of the members of statutory medical insurance believe that the statutory health insurers ought to be monitoring the quality of treatment that doctors and hospitals provide.

Consumer advice centres are regarded as independent of the medical healthcare system, and they provide, for example, information about alternatives in the healthcare service. Independent patient-information centres are also very important. Among other issues they explain to patients what their rights are, offer support in cases of suspected medical malpractice, provide information on financial issues, and offer general guidance.

There are an estimated 70,000 to 100,000 self-help groups in Germany, and many of them are concerned with healthcare. It is estimated that their achievements in their role as advisers save the German economy up to €2 billion a year. Despite the variety and quantity of available information, both informal and from institutions, comparative information about the quality of treatment from individual healthcare services is hardly available at all.

There is also room for improvement in the networking of available sources of advice. A desirable asset from the user's point of view would be a national Internet portal providing accredited and valuable information on health matters. The quality of information currently available on the Internet varies wildly. A range of quality assurance tools have been developed in the last few years, however. Specialist information as well as reliable information for ordinary people can be obtained from a wide range of online sources.

**The number of sources of information is growing.** Over the last few decades numerous information and advice centres have become established in Germany alongside the traditional preventive-care facilities. There are both informal and institutional centres; one example of the latter is the Institute for Quality and Efficiency in Healthcare, which was set up by the Federal Joint Committee in 2004 pursuant to section 139a of the German Social Security Code (SGB V) to make comprehensible information available to the public on standards and efficiency in healthcare provision.

Different sources of information and advice are used to varying degrees. According to the 2003 Telephone Health Survey, there is considerable interest in obtaining medical information. Only two percent of those interviewed said they were not using any source of information on health at all. Alongside the more traditional media such as radio, television, newspapers and books, more and more people are also using information from the insurance funds and above all the Internet, which is now being used by one person in three for obtaining medical information. It is mostly men who use the Internet for this purpose; all the other sources of information are used more often by women than by men [22].

**Comparative information on the quality of treatment is hardly available.** The amount of comparative information available on the quality of medical healthcare is limited [23]. The chances of obtaining information on the quality of a specific hospital are regarded as slim. In a representative survey in 2002, 58 percent of those asked said they did not have enough information to be able to make an informed choice on the best provider of inpatient healthcare; 49 percent said they are also insufficiently informed about ambulatory healthcare services [24].

Various tools are currently being developed to make the healthcare system more transparent, such as patient receipts, quality reports and comparative appraisals of hospitals. However, the concept is being developed primarily for professionals and at present they are not particularly user friendly. In order to make them more so, the information should be better presented and more easily obtainable. The existing providers of information should also be placed on a financially sustainable footing.

### 6.3.1 Providers of information and advice

**Providers of advice differ considerably in their interests and in how they are structured.** In Germany, advice and information on healthcare is characterized by differences in the interests and structures of those providing it. Many institutions offer both information and advice. At present there is no clear distinction between the two aspects.

There are four distinct groups of organizations providing information and advice: so-called consultation organizations (e.g. insurance funds, medical associations and pharmacies) are maintained by healthcare providers or third-party contributors and are consequently not generally regarded as disinterested parties. The increasingly well-established and independent advice centres (e.g. consumer organizations and patient-information centres) are not directly linked to providers in the healthcare system either organizationally, financially or conceptually. Public agencies (e.g. the public health service) provide advice, for instance, on the prevention of infectious diseases, the health of children and adolescents, or the treatment of addictions and psychiatric diseases. Finally, there are private and commercial information providers (such as the pharmaceutical industry).

Doctors are still the most important advisors. Patients seek advice from different sources, depending on the nature of their illness, the kind of information they are looking for, their personal preferences and experience. As in the past, doctors are still the most likely source of advice [4]. However, many patients want additional advice, a second opinion or guidance from sources other than those of the medical healthcare system [25].

This development is increasingly being recognized by the medical profession itself. Almost every regional medical association offers its own patients' advisory service. In the state of North Rhine-Westphalia, the North Rhine Medical Association and the Westphalia-Lippe Medical Association were involved in a pilot project called "The Health System – Citizen Orientation" [24] and are continuing with their consultative work even now that the project has ended. One request that is often made is for the address of doctors and clinics and hospitals, although no recommendations are made as to the quality of the different establishments. The National Association of SHI Physicians (KBV) offers a nationwide online doctor search service.

Health related themes	Clinical picture, medical therapies, side effects, pharmaceutical products, alternative health therapies
Health insurance fund benefits	Benefits catalogue, pursuing claims against health insurance funds, insurance premiums and contribution rates
Psycho-social support	Promotion of personal strengths, assistance in coping with everyday life
Legal issues	Documents to be used by third parties in the event of incapacity, living wills, the legal position on care, the legal position on severe disability
Complaints and medical malpractice	What to do in cases of suspicion of medical malpractice
Financial aspects	Dealing with financial demands, advice on individual health services ( non-insured, out of pocket payments for care), Doctors' and dentists' fee rates and scale of charges
Pension insurance	Questions and queries to do with pension insurance and retirement benefit
Ambulatory assistance	The way to ambulatory assistance
Addresses	Desire for information about health care providers, self-help groups etc.

**Table 6.3:** Subjects about which information and advice was sought – Results taken from the pilot projects as per § 65b SGB V [37]

A similar trend can be observed in dental medicine. More than 45 patient advisory centres have been set up nationwide via the regional dental chambers. Furthermore, the Federal Dental Chamber has installed a nationwide telephone hotline.

**Patients' spokespersons as ombudsmen in hospitals.** Advice for patients is also provided in clinics and hospitals. Social care structures were set up in clinics and hospitals in the 1970s. Now there are many self-help groups offering advice on specific illnesses. Many establishments appoint a patients' spokesperson or create an ombudsman unit or complaint-assistance unit. This is a legal obligation in six states in Germany.

The role of the patients' spokesperson is to follow up complaints arising from a stay in hospital, to be available as contact person, and to represent the patients' interests vis-à-vis the clinic if they have requests or matters of concern. Patients' spokespersons have regular consultation hours and are expected to keep the patients informed [7, 26].

**The health-insurance companies are increasingly willing to offer support in indemnity cases.** The statutory health insurers are committed to maintaining, restoring or improving the health of their members. Supporting insured people who are seeking redress for the results of medical malpractice is a discretionary provision of the Social Security Code (section 66 of the SGB V). Several health insurance funds are becoming increasingly willing to offer such support in response to the express wishes of many patients [27].

The insurance funds believe they are well suited to providing advice to insured people, and the latter agree [28]. Four-fifths of German SHI members would like their insurance provider to provide information and explanations [29]. About 83 percent of their members argue that health-insurance providers should also take on a lawyer's role on their behalf. No less than 73 percent said that insurance funds should check the standards of treatment provided by doctors and hospitals.

Insurance funds are increasingly prepared to offer their members telephone advice. In special call centres, staff from various healthcare professions (doctors, psychologists, dieticians, nurses) are on hand to answer calls on illness and medication, to help people find the right doctor and to provide information about such subjects as fitness and diet. It appears, however, that there is room for improvement in the quality of the advice being given [30]. For callers it is especially important that they can reach someone at the call centre quickly at different times of the day and can have a personal talk with someone [31].

**Healthcare cost providers in rehabilitation have created information centres all over Germany.** The long-term nursing care insurance funds, often in close collaboration with the health insurance funds, also provide information and advice (section 7 and section 72 subsection 5 of the SGB XI). Here the focus is on questions about care entitlements and application procedures, organizational and legal issues, as well as information on providers and what nursing-care provision can offer [32].

Book IX of the German Social Security Code, which came into force in mid-2001, commits the contributors to third-party rehabilitation services (for example pension and health insurance, the Federal Employment Office, employers' liability insurance associations) to setting up a common information centre in every administrative district and in every urban municipality. The role of these centres is to offer comprehensive advice to those seeking it on the areas of expertise of all the third-party contributors, thereby providing the advice seeker the information needed to choose a tailor-made rehabilitation programme.

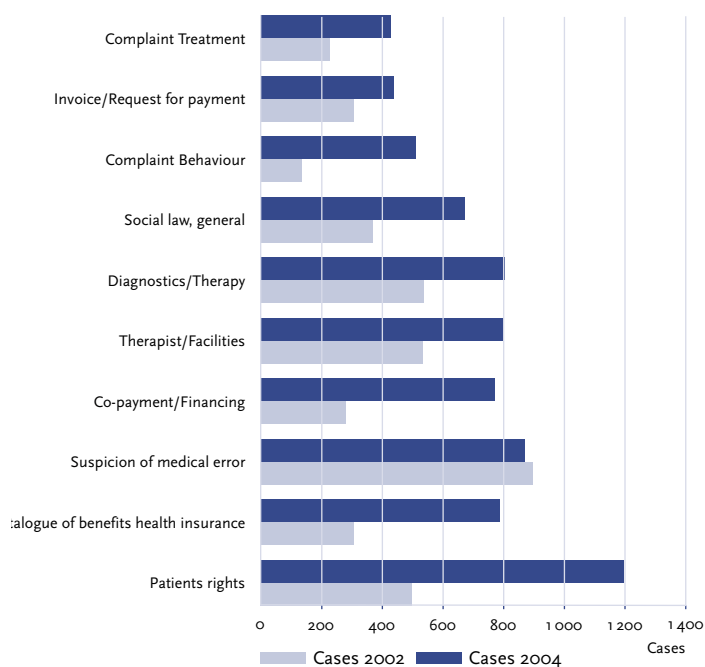
**Welfare organizations are increasingly giving advice on the health system.** By dint of their commitment as private agencies to youth care, social welfare and geriatric care, major social and welfare organizations have traditionally been involved in people's concerns in various walks of life and different circumstances and have a lot of experience in the field of advice and care work. This group of information providers includes social associations and associations for the disabled (e.g. the German Social Association) as well as independent welfare agencies such as the German Red Cross, the Workers' Welfare Association, the Workers' Samaritan Federation of Germany, Johanner Accident Assistance, the Diaconal Association of the Protestant Church, Caritas Germany (the Roman Catholic charity organization), the Maltese Relief Agency and the German Voluntary Welfare Association.

**Consumer organizations and patient-information centres are regarded as independent patients' advice and liaison services.** The Federation of German Consumer Associations functions as the umbrella organization for 39 consumer and social organizations in Germany, including the 16 consumer associations in the federal states with their regional consumer advice centres. These offer a varied range of printed information. In some of the consumer advice centres, citizens can obtain advice on such subjects as choosing their own doctor, hospital and health insurance, as well as doctors' and dentists' bills, and legal questions in the event of disputes with doctors or insurers, or in case of medical malpractice (see for example [www.vznrw.de](http://www.vznrw.de) or [www.patientenprojekt.de](http://www.patientenprojekt.de)). The consumer associations are independent of the medical healthcare system and are widely recognized and respected.

Patient-information centres that have linked up with the Federal Alliance of Patients' Centres and Initiatives (BAGP) can also be classified as independent advice and liaison services. There are now twelve patient-information centres which are sponsored by non-profit making organizations (see [www.patientenstellen.de](http://www.patientenstellen.de)) [33]. The information centres receive criticisms and complaints about healthcare provision from patients and professionals, and try to achieve the relevant improvements, e.g. on the Federal Joint Committee, where the BAGP sits in an advisory capacity. Patient-information centres provide information on health, transparency and patients' rights, give advice on complaints or lack of care in healthcare provision, and support where there is suspicion of medical malpractice or incorrect invoicing. Records show that advice is given about 10,000 times a year.

Furthermore, there is a colourful variety of associations that have been founded for the purpose of protecting or representing patients (for example "Patient Protection", the German Association of Insurants and Patients). It needs to be said, however, that the aims of these groups are frequently not transparent, and it may be unclear what interests lie behind them [23].

**Independent advisory and consultation facilities are supported by law.** With the incorporation of section 65b into the German Social Security Code (SGB V) as part of the Health Reform Act, the statutory health insurance funds were given the responsibility of financing, in the form of pilot projects, independent consumer and patient advice organizations. In the context of pilot projects the leading associations of health insurance funds provide an annual total of € 5,113,000 to support advice and liaison services. In order to qualify for funding, a service has to be set up for the purpose of providing information, advice and clarification for insured persons and be recognized by the leading associations as an appropriate organization to receive financial



**Figure 6.3:** Thematic areas of consultation/advice. Source: Project of the Federal consortium of patient organisations and patient initiatives (BAGP)

support: proof of neutrality and independence are prerequisites of such recognition.

Tenders are invited for pilot projects on this basis. 300 tenders were received for the first invitation from diverse organizations with different aims. 30 were accepted for the pilot project. After the end of the first pilot phase, a new invitation to tender was issued in mid-2005. This time applicants had to prove the existence of network structures, in line with the recommendations arising from the scientific research accompanying the projects. Recommendations and results can be viewed at [www.g-k-v.com](http://www.g-k-v.com).

**Advisors need to be competent and have sufficient time at their disposal.** The results of the pilot project show that people seeking advice are primarily interested in health-related information, although questions on insurance rights and the search for specialized and competent healthcare providers also crop up frequently (see Table 6.3). It should be noted, however, that it is almost impossible to answer questions on the quality of healthcare providers. In the first place, there are legal regulations against emphatic, preferential recommendations; and second, even if the law allowed it, there would be insufficient data available to justify such recommendations.

Those seeking advice are highly satisfied with the independent patients' and consumers' advice facilities. Users specifically stress the fact that they were given competent assistance and that the advisors devoted enough time to them [34]. Women, the elderly, and people with a medium- or high-level school-leaving certificate are statistically more likely to use the service than men, younger people and people with a low level of education. Foreigners living in Germany tend not to seek medical advice in this way [35].

It is the role of the advisors to point people in the right direction and pass on information and expertise – and in doing so to reinforce patient autonomy [36].

**The need for financial and legal advice is on the increase.** The need for advice has been affected by general health policy. This was shown by the evaluation of a project sponsored by the Federal Alliance of Patient Centres and Initiatives (BAGP project, see Figure 6.3). More questions were asked in 2004 than in 2002 on patients' rights, health-insurance services and supplementary contributions, relating to complaints, providers or third-party contributors. This corresponds to a trend in health policy towards higher rates of personal contribution and restrictions on SHI coverage. The increase in the number of healthcare services rendered privately by doctors and the fact that more bills are presented directly to the patient cause uncertainty and lead to a considerable need for advice [38]. By contrast, the number of questions about suspected cases of medical malpractice has hardly changed since 2002, suggesting that this phenomenon has neither improved nor deteriorated. In 2004 suspected cases of medical malpractice were the second most frequent reason for questions to the centres.

**Experts expect patients' and self-help organizations to be the main providers of patient advice in the years to come.** In the context of the scientific research accompanying the pilot projects pursuant to section 65b of the SGB V, approx. 200 experts were asked about the role they expected the provision of advice to patients to play in the future and which providers of advice would be the most important to patients. About 80 percent of those asked expected advisory services to patients to increase in importance over the next 20 years: 63 percent included patient advice centres among the most important advice facilities, 57 percent mentioned self-help organizations, 43 percent clin-

ics and hospitals, and these were followed by rehabilitation centres (32 percent), ambulatory nursing-care services (29 percent), statutory health insurers (29 percent) and consumer advice centres (28 percent). Associations of SHI physicians, medical associations, pharmaceutical companies and commercial suppliers were only regarded by a few of those questioned as significant providers of advice. Only 15 percent of those questioned regarded the German Ministry of Health, the Public Health Office or pharmacies as being among the most important purveyors of advice [39].

### 6.3.2 Self-help groups

**Self-help groups offset deficits in the healthcare system.** Self-help groups arose as a reaction to deficits in the healthcare system. After a period of rejection by professionals they came to be an integral part of healthcare provision [40]. It is now generally accepted that being personally involved can be the first step to becoming an expert in a subject, and that self-help groups make a significant contribution to patient care [41, 42]. It is estimated that self-help groups in the field of health save the economy about € 2 billion a year [43].

There are an estimated 70,000 to 100,000 self-help groups in Germany with approximately three million members, many of whom are active in the field of healthcare [44]. There were 273 self-help contact centres in Germany in 2003 (201 of them in western Germany and 72 in the eastern Germany) operating as points of departure for anyone interested in self-help groups. Almost half the contact centres were managed by the German Voluntary Welfare Association or its member organizations [45]. Coordination is organized across Germany by the National Clearing House for the Encouragement and Support of Self-Help Groups (NAKOS).

According to the German Social Code (section 20 of the SGB V), the health insurance funds are committed to funding self-help groups with a flat rate or with sums for individual projects with an annual sum totalling a fixed amount per insured person. In 2004 this amount was € 0.54 per insured person, of which only € 0.39 (€ 28 billion in total) was transferred directly to self-help organizations. In other words, the health insurance funds have yet to meet their legal obligations in this respect. The causes are understood to be structural problems for the health insurance funds and a high level of red tape in the funding process, but difficulties are encountered by self-help groups, too, when completing the formalities of applying for funding [44].

► Comprehensive Information on **Self-help in Healthcare** is to be found in booklet 23 of the Federal Health Reporting's series [44].

### 6.3.3 Information available over the Internet

**The quality of information available over the Internet varies considerably.** Medical information on the Internet ranges from the neutral and reliable clarification of facts at one end of the spectrum to open product advertising at the other. A qualitatively sound, national health web portal for ordinary people, like the one that exists in the UK for example or the USA ([www.healthfinder.gov](http://www.healthfinder.gov)), is not available in this form for Germany. There are plans underway for a European Union web portal offering access to fact-based information at the European level [46].

The "Action Forum Health Information System" (AFGIS) was established some years ago on the initiative of the German government with the aim of raising the standard of information on the Internet by developing criteria for standards. AFGIS presents providers of high-standard information with a logo of excellence. Before this logo is awarded, the website under consideration is checked for its transparency and for the standards of communication, explanations and data protection. The range of accredited providers ranges from commercial institutions to research institutions, health insurance funds and self-help groups.

Another tool for ensuring the standard of electronically transmitted information on health is Discern ([www.discern.de](http://www.discern.de)), which can be used to assess the quality of websites for themselves. Quality standards for websites providing information on health-related matters have also been elaborated by the European Commission [47]. The decisive criteria are transparency and reliability, naming authors and all sources, data protection, constant updating, clarity as to who is responsible, and ease of access. The Swiss "Health on the Net" foundation uses similar criteria for evaluating standards ([www.hon.ch/HONcode/Conduct.html](http://www.hon.ch/HONcode/Conduct.html)) for its HON-Code seal, which is also used by many German providers.

**Professional medical literature is easily obtainable over the Internet.** The bibliographical database PubMed, issued by the American National Library of Medicine, has over 15 million references on specialist bio-medical publications, in some cases with direct links to summaries and articles. In Germany, the German Institute for Medical Documentation and Information DIMDI ([www.dimdi.de](http://www.dimdi.de)) provides a comprehensive database of professional literature as well as information on classifications of illnesses, pharmaceutical products, medical products and medical procedures. A section of the information available is especially tailored to meet the needs of patients and doctors. The German National Library of Medicine ([www.zbmed.de](http://www.zbmed.de)) also offers access to medical literature via an electronic library of publications and a database information system. Much of the information obtainable in these databases is in English, but much of it is written for specialists.

**Treatment guidelines and therapy assessments are also available online.** The German Association of Scientific Medical Societies (at [www.leitlinien.net](http://www.leitlinien.net)) provides all the scientifically based guidelines on diagnosis and therapy. Some guidelines include a specially prepared summary for patients.

The Cochrane Collaboration is a global network of scientists and doctors who create systematic and up-to-date overviews

#### Note on the list of internet addresses

The Internet addresses presented in Section 6.3.3 are meant as examples and are not systematic. They should not be interpreted as an assessment or hierarchy.

(the Cochrane Reviews) providing an evaluation of therapies. A Cochrane Review offers all the available data relevant to a specific question, so as to paint the most objective picture possible. The Cochrane Review Centre in Freiburg ([www.cochrane.de](http://www.cochrane.de)) provides a link to the Cochrane Library itself and thus a chance to look through and print out any of the abstracts that are there.

The German Agency for Quality in Medicine has set up a web portal at [www.patienten-information.de](http://www.patienten-information.de) offering accredited information for patients and members of the general public. Along with professional literature, the site offers advice on patient education, self-help and patient-information centres and quality checklists. The Institute for Quality and Efficiency in Healthcare (IQWiG) offers citizens independent and accredited information based on the latest scientific developments at [www.gesundheitsinformation.de](http://www.gesundheitsinformation.de).

***There are numerous websites providing information on cancerous diseases.*** The Cancer Information Service at the German Cancer Research Centre in Heidelberg KID ([www.krebsinformation.de](http://www.krebsinformation.de)) provides up-to-date information on cancerous diseases. Members of the general public and patients can obtain advice via e-mail or by phone. The KID is sponsored by the Federal Ministry of Health with additional funding from the Social Services Ministry of Baden-Württemberg. 17,418 telephone and 2,446 e-mail queries were dealt with in 2004: 63 percent of those seeking advice were women, 35 percent men (2 percent did not say). By far the largest proportion of queries came from patients or their relations (40 percent respectively). Apart from this 80 percent, inquirers were friends and acquaintances (6 percent of queries), healthcare professionals (4 percent) and interested general members of the public (7.5 percent).

The German Cancer Society ([www.krebsgesellschaft.de](http://www.krebsgesellschaft.de)) and German Cancer Aid ([www.krebshilfe.de](http://www.krebshilfe.de)) provide information on cancer diseases on their websites. The “PDQ (Physicians’ Data Query) Treatment Information for Patients” deals with the broadest variety of cancers ([www.meb.unibonn.de/cancernet/deutsch/](http://www.meb.unibonn.de/cancernet/deutsch/)). The information is based on the records of the US National Cancer Institute and is presented to the public. By contrast, the “Information Net for Cancer Patients and their Relatives” ([www.inkanet.de](http://www.inkanet.de)) grew out of a patient initiative, and its aim is to motivate those affected to find out more themselves about their illness and all the different sources of advice and information that are available to them.

***“Competence networks” explain the widest possible variety of illnesses.*** The so-called “competence nets” in medicine funded by the German Ministry for Education and Research ([www.kompetenznetze-medizin.de](http://www.kompetenznetze-medizin.de)) also provide information for patients, for example about depressive illnesses, strokes, dementia and AIDS. Other sites to look for on the Internet are the umbrella groups of self-help organizations and foundations, for example the German Rheumatic League ([www.rheuma-liga.de](http://www.rheuma-liga.de)) or the German Stroke Foundation ([www.schlaganfall-hilfe.de](http://www.schlaganfall-hilfe.de)).

The Federal Ministry of Health’s website offers a wide selection of information ([www.bmg.bund.de](http://www.bmg.bund.de)), as do the sites of the various federal state ministries. The Federal Centre for Health Education ([www.bzga.de](http://www.bzga.de)) and the Robert Koch Institute ([www.rki.de](http://www.rki.de)) offer users of their website extensive and varied information. The information system of the Federal Health Reporting, which provides data and analyses on all areas of the healthcare system, is also available online ([www.gbe-bund.de](http://www.gbe-bund.de)).

***Service providers and third-party contributors use their websites for contact with customers.*** The websites of the statutory and the private health insurers provide information on many health issues. Furthermore, there are opportunities to obtain

advice online as well as Internet advice forums. Various health-care providers, from pharmacists to dentists, provide information on the Internet about the services they offer and their conditions. The Federal Joint Committee can be reached online at [www.g-ba.de](http://www.g-ba.de). Commercial information centres in the health sector are also on the market, but their services are not all free and not always transparent.

A national and independent web portal on health would be most welcome from the users' perspective, one that either provides valuable information itself or links to such information. Such a web portal could also provide information on structures as well as data on the quality of care facilities [23].

In the future, improving the networking of different sources of information and advice will be of particular importance [32]. What is needed are points of departure which take into account the whole person to a much greater extent than care facilities have done up to now, which work as pilots through the waters of the healthcare system, which answer questions about costs and, in addition to all these things, provide psycho-social support. Citizen and patient orientation organized in such a way would make a decisive contribution to healthcare in Germany.

► Comprehensive Information on **Citizen and Patient Orientation in the German Healthcare System** is to be found in booklet 32 of the Federal Health Reporting's series [32].

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## Glossary

The glossary contains selected terms of general importance. As a rule specialist expressions or abbreviations have been directly explained in the text. For further information on medical specialist terminology we refer to the relevant medical literature.

### Eastern Germany

Area of the former German Democratic Republic, which now consists of the Federal States of Thuringia, Saxony, Mecklenburg-Western Pomerania, Brandenburg and Saxony-Anhalt

### Western Germany

Area of the former Federal Republic of Germany before 1990.

**Age Standardisation**

A calculation process by which sickness and mortality rates are adjusted to that of a so-called standard population with a defined age structure. The age standardisation process removes the effect of the process of an ageing society, making it easier to interpret changes in sickness rates. Using age standardised data it is also possible to make comparisons between countries which have different age structures.

**Biocide**

An agent which damages or destroys living organism (pesticide)

**Body Mass Index**

*See the definition on page 113*

**Budgeting**

Remuneration for health care provision on the basis of a fixed or maximum amount

**Causes, external**

Non-natural causes of death or disease, for example accidents, injuries, poisonings, acts of violence and suicides

**Cohort**

A group of persons who can be defined in terms of a common characteristic, for example their age

**Costs of Illness**

*See definition on page 195*

**Death Rate**

*See Mortality*

**Deaths, preventable**

*See the definition on page 67*

**Direct Purchases**

Expenditure by private households or others on health care services or products which are not covered or not entirely covered by other third party payers (for example health care insurance) or which are part of copayments

**Disease Management Programme**

A treatment programme for chronic diseases which is oriented around standardised guidelines, the progress and result of the therapy being documented all the time and where the patient is involved to an especially significant extent. The terms "structured treatment programme" and "chronic disease programme" are also used.

**Drug Affinity Study**

A survey which has been carried out at regular intervals since 1973 by the Federal Centre for Health Education, questioning adolescents and young adults between the ages of 12 and 25 about the consumption of drugs. The study covers cigarettes, alcohol and illegal drugs.

**Diagnosis related Flat-rates per case**

Flat rate reimbursement per hospital treatment case

**Health-related benefit payments**

*See the definition on page 187*

**Health expenditure**

*See definition on page 187*

**Health Survey**

Representative population study which, by means for example of interviews and examinations, studies the frequency of illnesses and complaints, satisfaction with health and quality of life as well as health behaviour and the extent of use of medical care services

**High Utiliser**

Persons who make heavy claims on the health care system, for example through higher than average numbers of visits to the doctor owing to somatic complaints

**Incidence**

Frequency of new occurrences of an illness or disease, measured for example as the annual number of new occurrences per 100,000 persons

**Indicator**

Key number

**Ischaemia**

*See definition on page 23*

**Life expectancy (average, mean, remaining)**

*See definition on page 15*

**Healthy Life expectancy**

*See definition on page 16*

**Longitudinal study**

Longitudinal studies follow the development or behaviour of a population or a representative randomly selected population sample in the course of a given period of time

**Mammography**

Radiography of the female breast

**Median**

The value of a distribution curve above and below which 50 percent of the individual values are to be found. In the case of an even (bell shaped) curve, the median and the mean value are identical averages. When the distribution curve is uneven, for example in the case of income distribution in a population, the median differs from the mean value.

**Menopause**

The time when the menstrual cycle has come to a natural end

**Metabolic Syndrome**

*See the definition on page 117*

**Microcensus**

The microcensus is the official representative statistic of the population and the labour market, in which 1 percent of all households in Germany are questioned annually (continuous household sample survey). Four yearly additional programmes cover reveal statistics about housing, health insurance as well as health and the nature and extent of disabilities.

**Morbidity**

Frequency of an illness (see also Incidence, Prevalence)

**Mortality**

The death rate calculated for example as per 100,000 persons in the space of a year. The figure is given as a total mortality rate or applied to individual illnesses and is mostly age-standardised (see Age Standardisation).

**Odds Ratio (OR)**

Serves as comparative measure of risk (of contracting illness). For example the odds ratio can be calculated from the relationship of sick to healthy in two different population groups. If the ratio is higher or lower than one, then the risk is unevenly distributed.

**OECD**

Organisation for Economic Co-operation and Development.

**Ottawa Charter**

A charter presented at the first International Conference on Health Promotion (Ottawa 1986), calling for action aimed at achieving "Health for All" by 2000 and beyond.

**Particulate matter**

*See definition on page 91*

**Perinatal**

The time around birth (between the 39th week of pregnancy and seven days after birth).

**Percentile; Quartile**

A percentile to which an n percent result is given (for example the 95 % percentile) indicates the point (as a percentage) in a scale of recorded values where the values are either equal or less than the n percent result. Special percentiles are median (50 %), quartile (25 %, 50 %, 75 %) or quintile (20 %, 40 %, 60 %, 80 %)

**PISA Study**

PISA stands for Programme for International Student Assessment. The study is part of the International Indicators of Education Systems (INES) of the Organization for Economic Cooperation and Development (OECD). With the results of PISA studies an OECD member state can compare data about its education system with those of other member states.

**Plasticiser**

Material applied to resins and plastics in order to make them more pliable and elastic

**Potential years of life lost**

*See definition on page 66*

**Prevalence**

The frequency of a disease, measured by the number of persons who on a randomly selected day (point prevalence) or within a year (one-year prevalence) are found to be suffering from a particular illness or disease.

**Prevention (primary, secondary, tertiary)**

*see Definition Page 125*

**Prospective**

Refers to a study in which the participants are followed forward in time. During the study certain data are first generated and not just existing and available information retrospectively interpreted. Prospective studies are regarded as sounder and less likely to be biased than retrospective studies.

**PSA-Test**

Prostate-specific antigen test, a test to detect presence of prostate specific antigens in the blood. Various diseases of the prostate are marked by an increase of the level of PSA in the blood.

**Quality (structure, process, result)**

*See the definition on page 172*

**Quality circle**

A study group made up of persons with the same experiences or at the same professional level (here mostly office-based doctors), where issues about day to day work are discussed and proposals for improvement put forward. The target is a continuous process of improvement in the sense of quality management (QM).

**Representativeness; representative**

The quality of a random survey stating that the structure and composition of the surveyed population sample is such, that the results of the survey can be reliably applied to the underlying totality (e.g. a specific population subgroup or the whole population).

**Resistance**

The genetically determined ability of pathogens to withstand antibiotics.

**Infant mortality**

*See definition on page 75*

**Sentinel Surveys**

In sentinels, sentinel practices or sentinel health departments regularly transfer on a voluntary basis data about the number of cases of illness or other relevant data to a records office, to notify them about the evolution of given diseases, illnesses or health problems in the population or part of the population.

**Screening**

Mass examination of a population in order to detect diseases as early as possible

**SF 36 Questionnaire**

Short Form 36: questionnaire with 36 individual questions on the basis of which the level of health related life quality can be recorded.

**SHI** Statutory health insurance**Significant**

Describes a statistical result which is unlikely to be coincidental. Significance is one of several measures of the explanatory power of a statistical study.

**Significance level**

Indicates the probability level at which a statistical figure is accepted as having become significant (see definition). The lower the significance level (for example 0.05; 0.01), the more reliable the result.

**Somatic**

Pertaining to the body

**Socio-Economic Panel**

A continuous annually repeated survey, begun in 1984, of Germans, non-German residents and immigrants in both the new and old federal states. Among other issues the survey focuses on composition of the household, job history, family history, labour force participation rate, occupational mobility, health and life satisfaction.

**T Cells**

Sub-group of white corpuscles (lymphocytes) which play a central role in the body's defence mechanism. There are B and T lymphocytes, which both have different functions.

**Survival rate, relative**

*See definition on page 47*

**Vascular**

Related to the blood vessels

**VERA study**

A German acronym meaning Cooperative Study: Nutrition Survey and Risk Factor Analysis. A representative diet survey of the whole population was carried out in West Germany between 1985 and 1988 (the National Food Consumption Survey). A sub-sample of the households in the survey was examined using clinical-chemical and clinical-biochemical methods.

**Vulnerability**

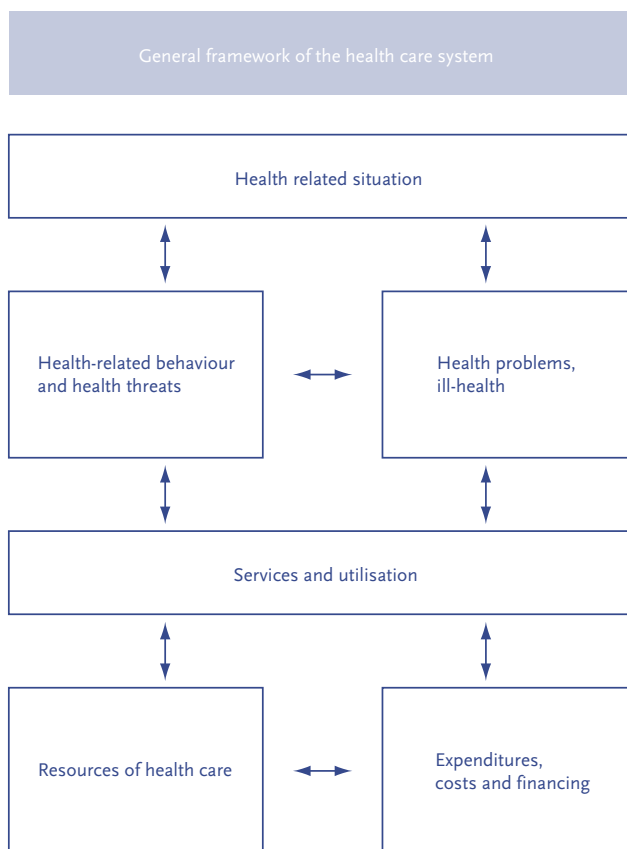
Susceptibility to injury; Susceptibility to an illness or disease

**WHO**

The World Health Organization.

## Federal Health Reporting

The Federal Health Reporting (Gesundheitsberichterstattung des Bundes, GBE) provides descriptions and analyses on all issues of the health system based on both data and indicators.



The federal health reporting system is dynamic and constantly updated, providing information on the different issues in the form of supplementary and related publications.

#### **Booklets published by the Federal Health Reporting**

The booklets published by the Federal Health Reporting provide, in an action-oriented and concise manner, information on the health status of the general population and on the health care system. Each booklet may be attributed to one of the major topics of the Federal Health Reporting and the internal structure of the report also follows the structure of the major topics. The major topics therefore form the framework as well as the structure of the individual booklets. Related topics may be bundled and published together. This continuous mode of publication assures that reports are up-to-date. The authors are recognised experts in their respective fields.

► [www.rki.de/GBE/GBE.HTM](http://www.rki.de/GBE/GBE.HTM)

#### **The Federal Health Reporting information database**

The information database of the Federal Health Reporting provides online health-related information on all major topics of the Federal Health Reporting in a rapid, compact and transparent manner. Information is provided in the form of customisable tables, concise graphs, comprehensible descriptions and precise definitions. The information, which is constantly being expanded and currently comprises more than a hundred sources of data, may be downloaded from the database. In addition, this system provides access to the GBE booklets and the contents of the Health Report for Germany (Gesundheitsbericht für Deutschland, published by Statistisches Bundesamt, Stuttgart, 1998).

► [www.gbe-bund.de](http://www.gbe-bund.de)

#### **Topical Reports**

Topical reports cover issues of health and the health care system in a detailed and comprehensive manner.

Statements made by the Federal Health Reporting refer to the national level and serve as a reference for the health reporting services of the individual states. The Federal Health Reporting therefore provides an expert basis for political decisions and offers a database of information to those interested. It further serves to monitor the success of measures taken and contributes to the development and evaluation of health targets.

The readers and users of GBE products are from a wide range of fields: health politicians, experts in scientific research institutions as well as the scientific public are addressed. The target audience also includes the general public, patients and consumers, and their associations.

**The following booklets and special study reports have appeared to date:**

- Booklet 1 Vaccinations
- Booklet 2 Terminal Care
- Booklet 3 Health Problems related with travelling abroad
- Booklet 4 Poverty of Children and Adolescents
- Booklet 5 Medical Malpractice
- Booklet 6 Foodborne Diseases
- Booklet 7 Chronic Pain
- Booklet 8 Nosocomial Infections
- Booklet 9 Utilisation of complementary and alternative diagnostics in medicine
- Booklet 10 Healthy ageing
- Booklet 11 Psoriasis
- Booklet 12 Decubitus
- Booklet 13 Unemployment and Health Status
- Booklet 14 Health of single mothers and fathers
- Booklet 15 Hepatitis C
- Booklet 16 Overweight and Obesity
- Booklet 17 Organ Transplantation and Organ Donation
- Booklet 18 Emerging and Re-emerging infectious diseases
- Booklet 19 Pet Keeping – Chances and Risks for Health
- Booklet 20 Unintentional Childlessness
- Booklet 21 Anxiety Disorders
- Booklet 22 Skin Cancer
- Booklet 23 Self-help in the area of health
- Booklet 24 Diabetes mellitus
- Booklet 25 Breast Cancer
- Booklet 26 Physical Activity
- Booklet 27 Sleep Disorders
- Booklet 28 Dementia
- Booklet 29 Hearing Disorders and Tinnitus
- Booklet 30 Health-related Early Retirement
- Booklet 31 HIV and AIDS
- Booklet 32 Citizen and Patient Orientation in the Health Care System
- Booklet 33 Coronary heart disease and acute myocardial infarction
- Booklet 34 Doping in recreational and mass sports
- Booklet 35 Tuberculosis
- Booklet 36 “Prostate diseases”
- Booklet 37 “Uterine diseases”
- Booklet 38 “Accidents at work and occupational diseases”
- Booklet 39 “Urinary Incontinence”
- Booklet 40 “Alcohol consumption and alcohol-related disorders”

Federal Health Reporting Focus Reports

- The Health of Children and Adolescents
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**Recommended Format when Quoting:**

Robert Koch Institute (Publisher) 2008. Health in Germany. Federal Health Reporting. Robert Koch Institute, Berlin

**Bibliographical Information of the German Library**

The German Library lists this publication in the German National Bibliography.



**Publisher**

Robert Koch Institute  
Nordufer 20  
13353 Berlin

**Editorial Office**

Robert Koch Institute  
Federal Health Reporting  
Dr. Cornelia Lange, Jürgen Thelen, Dr. Thomas Ziese  
Seestrasse 10  
13353 Berlin

**Translation**

Jens Jaspert, Bob Culverhouse  
Robert Koch Institute

**Source of Information:**

E-Mail: [gbe@rki.de](mailto:gbe@rki.de)  
[www.rki.de](http://www.rki.de)  
Tel.: 00 49 (0)18 88 7 54-34 00  
Fax: 00 49 (0)18 88 7 54-35 13

**Format**

blotto design, Berlin

**Print**

Oktoberdruck AG, Berlin

**ISBN**

3-89606-173-9 (german)  
3-89606-188-1 (english)

The political and financial responsibility for the Federal Health Reporting lies with the German Federal Ministry of Health.

*Federal Health Reporting*

The Robert Koch Institute in cooperation with  
the Federal Statistical Office

**Health in Germany**

June 2008

© Berlin: Robert Koch-Institute  
ISBN 3-89606-173-9 (german)  
ISBN 3-89606-188-1 (english)