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ORIGINAL PAPER

German Heart Report 2013

Thomas Meinertz · Anno Diegeler · Brigitte Stiller · Eckart Fleck · Markus K. Heinemann · Achim A. Schmaltz · Martin Vestweber · Kurt Bestehorn · Andreas Beckmann · Christian Hamm · Jochen Cremer

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Abstract
Objectives The 25th German Heart Report provides a comprehensive analysis of morbidity and mortality in patients with selected heart diseases as well as services and care in cardiology and cardiac surgery in Germany during the period 2011–2012. It is the result of a multidisciplinary collaboration between the German Heart Foundation, the German Cardiac Society, the German Society for Thoracic and Cardiovascular Surgery, and the German Society of Pediatric Cardiology and is based on data from different sources. In addition, trends of the period from 1995 to 2012 are presented.
Results The trends in morbidity due to cardiac diseases in 2010 and previous years continued in 2011. Compared with data from 1995 to 2010, one can observe:

- a slight decrease in ischemic heart disease in every age group
- a distinct increase in valve diseases, predominantly at age >75 years
- an increase in arrhythmias from the age of 45 years on
- an increase in cardiac failure, especially beyond the age of 75 years.

Compared with data from 2009, the mortality rates in 2011 differ somewhat; there is:

- a decrease in heart failure and coronary heart disease
- no change in arrhythmias
- a distinct increase in valvular heart diseases
- an additional, small decrease in congenital heart defects.

These data are in agreement with findings from other Western countries. Coronary heart disease, the most frequent cardiac disease, has continuously decreased in frequency and mortality since 2000. The underlying reasons are discussed.
Conclusion This report is an important resource for all parties of the healthcare system regarding heart disease conditions and their treatment in Germany.

Keywords Heart disease · Morbidity · Mortality · Diagnostic · Therapy procedures

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T. Meinertz (✉) · M. Vestweber
German Heart Foundation, Frankfurt, Germany
e-mail: tm@prof-meinertz.com

A. Diegeler · M. K. Heinemann · A. Beckmann · J. Cremer
German Society for Thoracic and Cardiovascular Surgery, Berlin, Germany

B. Stiller · A. A. Schmaltz
German Society of Pediatric Cardiology, Düsseldorf, Germany

E. Fleck · K. Bestehorn · C. Hamm
German Cardiac Society, Düsseldorf, Germany

K. Bestehorn (✉)
Institute for Clincal Pharmacology TU Dresden, Dresden, Germany
e-mail: kurt.bestehorn@googlemail.com

Introduction and background

In 1988, the Conference of German Health Ministers initiated the German Heart Report (GHR) to evaluate the need for cardiac surgery facilities. During the following years, the report—edited by E. Bruckenberger—was further evolved to give an overview of activities and accomplishments in cardiology and cardiac surgery in Germany. The GHR currently provides extensive information on morbidity, mortality, diagnostic methods, and therapeutic procedures for heart disease [1].

The GHR is based on a multidisciplinary collaboration between the German Heart Foundation, the German Cardiac Society, the German Society for Thoracic and Cardiovascular Surgery, and the German Society of Pediatric Cardiology. In 2013, the quality of the data forming the basis of the report was improved; i.e., the data sources were documented in detail than in previous reports. Therefore, the 2013 GHR provides more comprehensive information on health services for patients with selected cardiac diseases [2]. The previous presentation of the data, organized according to the disciplines of cardiology, cardiac surgery, and pediatric cardiology, has been replaced by a system of disease categories: coronary heart disease (ischemic heart disease), heart failure, valvular heart disease, cardiac arrhythmias, and congenital defects of the heart. Three short chapters on cardiac rehabilitation, major areas of cardiovascular research in Germany, and development of resources and framework for cardiology, cardiac surgery, and pediatric cardiology complete the report.

This paper describes the most important findings of the GHR. For further details and analysis, please refer to the full report.

Methodology and data sources

The GHR describes mortality and inpatient morbidity, defined as number of inpatient cases per 100,000 inhabitants, due to heart disease as well as diagnostic and therapeutic procedures for selected cardiac conditions. Owing to a lack of comprehensive, nationwide morbidity data, the report refers to diagnostic data from hospitals [3]. The report, based on the international classification of diseases (ICD-10) for the main diagnosis, provides inpatient morbidity data and limited socio-demographic data (age and sex). Mortality and mortality rates (incident cases per 100,000 persons) as well as inpatient morbidity rates (number of inpatient cases per 100,000 inhabitants) were obtained from the Federal Statistics Office as a dimension of hospital healthcare utilization [4].

To account for regional differences in the age distribution of the population and the interdependence of age and selected cardiac diseases, upper and lower limits for age-adjusted mean morbidity and mortality rates were calculated individually for each federal state.

Further data sources are shown in the following table.

Annual Registry of the German Society for Thoracic and Cardiovascular Surgery [5]	Coronary Artery Bypass Graft (CABG), heart valve surgery, aortic surgery, thoracic organ transplantations, mechanical circulatory support systems, pacemaker, cardioverter defibrillator implantations (ICD), and procedures for congenital heart defects
Data collection from the German Cardiac Society [6]	Coronary angiography, percutaneous coronary intervention (PCI), electrophysiological procedures, ablations, pacemaker/ICD implantations
AQUA Institute for Applied Quality Improvement and Research in Health Care [7]	Coronary angiography, PCI, aortic valve replacement and transcatheter aortic valve implantation (TAVI), and pacemaker/ICD procedures
Federal Association of Statutory Health Insurance Physicians [8]	Outpatient coronary diagnosis and intervention
German Foundation for Organ Transplantation [9]	Transplantations
Survey of the German Society of Pediatric Cardiology [10]	Inpatient treatment, diagnostic procedures (echocardiography, cardiac and extracardiac catheterization procedures with and without cardiac or vascular interventions in patients with congenital heart disease of all ages)

Results

Coronary heart disease

Mortality and inpatient morbidity trends over time

In 1980, the mortality rate for ischemic heart disease was considerably lower in women than in men (Fig. 1). By 1993, however, it had reached the same level, and within the following years the mortality rate for women was higher than that for men until 2007. The increase in the overall mortality rate between 1980 and 1993 was, in fact, solely due to the increased proportion of female patients. In contrast, the trend for men was a continuous decrease in mortality from 1985 on, and since 1995 the mortality rate has been declining continuously for both genders.

In a similar pattern, the total mortality rate for acute myocardial infarction decreased over the long term in men since 1980 and in women since 1995 (Fig. 2). The decrease was more distinct in men (about 50 %) than in women (about 35 %). Despite the pronounced decrease in mortality for men, the prognosis after an acute myocardial infarction in 2011 was less favorable in men than in women.

The mortality rate after myocardial infarction varies considerably between the federal states (Fig. 3). As in previous years, the highest mortality was observed in Sachsen-Anhalt, Sachsen, Brandenburg, Thüringen, and Mecklenburg-Vorpommern. Compared with 2010, there

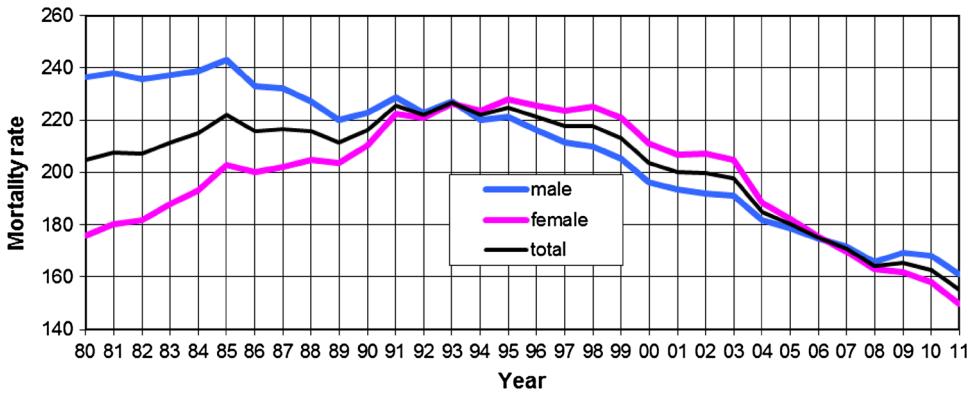

Fig. 1 Trend in mortality rates for ischemic heart disease: 1980–2011. Calculations are based on data from the Federal Statistics Office. Data for 1980 through 2010 are derived from the Heart Report 2010

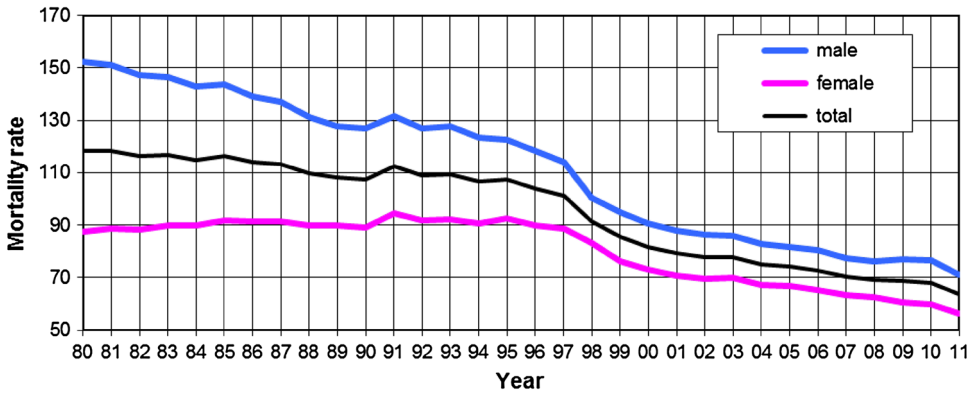

Fig. 2 Trend in mortality rates for acute myocardial infarction in Germany: 1980–2011 (data from 1980 through 1989 are from the Federal Republic of Germany and the German Democratic Republic). Calculations are based on data from the Federal Statistics Office. Data from 1980 through 2009 are derived from the Heart Report 2010

was a trend towards higher mortality for the myocardial infarction-related mortality in these federal states. The right panel of Fig. 3 shows the upper and lower deviation in the age-adjusted mean mortality rate in the federal states.

After a peak in 2000, inpatient morbidity due to ischemic cardiac disease has decreased continuously, and, in 2011, it dropped below the 1995 level (Fig. 4). This pattern was similar in men and women; however, the disease was less than half as frequent in women than in men.

Procedures and events

In 2012, the number of in-hospital left-heart catheterization procedures was 857,688, which was a slight decline compared with 2011. A total of 337,171 balloon angioplasties (PCIs) were performed, involving the use of 302,724 stents. Compared with previous years, the number of PCIs increased slightly, and the percentage of drug-eluting stent implantations increased from 54 % in 2011 to 68 % in 2012.

At least one intra-procedural event was reported in 1.05 % of left heart catheterization procedures and in 1.93 % of PCIs in 2012. Post-procedural (until discharge) events were reported in 2.91 and 4.17 % of angiography procedures and PCIs, respectively.

In 2012, 75,706 left heart catheterizations and 21,512 PCIs were performed in outpatient facilities. Both rates were more or less constant compared with 2011. The intra-procedural complication rates were reported as 0.67 % for left heart catheterizations and 1.37 % for PCIs.

In 55,302 patients, coronary artery bypass graft procedures (CABG) were performed in 2012 and thus remained nearly unchanged compared with 2011. Among these 6,859 CABG procedures were performed without the extracorporeal circulation (ECC). 42,249 of the patients were male (76 %), and 49.3 % of the patients were older than 70 years. This ratio remained constant over the last years. The in-hospital survival rate of all these patients was 97.1 %. This is a nearly consistent value over the last 10 years.

Valvular heart disease

Morbidity and mortality

Since 2005, the inpatient morbidity rates of valvular heart disease have increased steadily (Fig. 5). The rates in men have risen more markedly than in women since 2002, but the trend is similar. During the same time period, however, life expectancy and other parameters for these patients

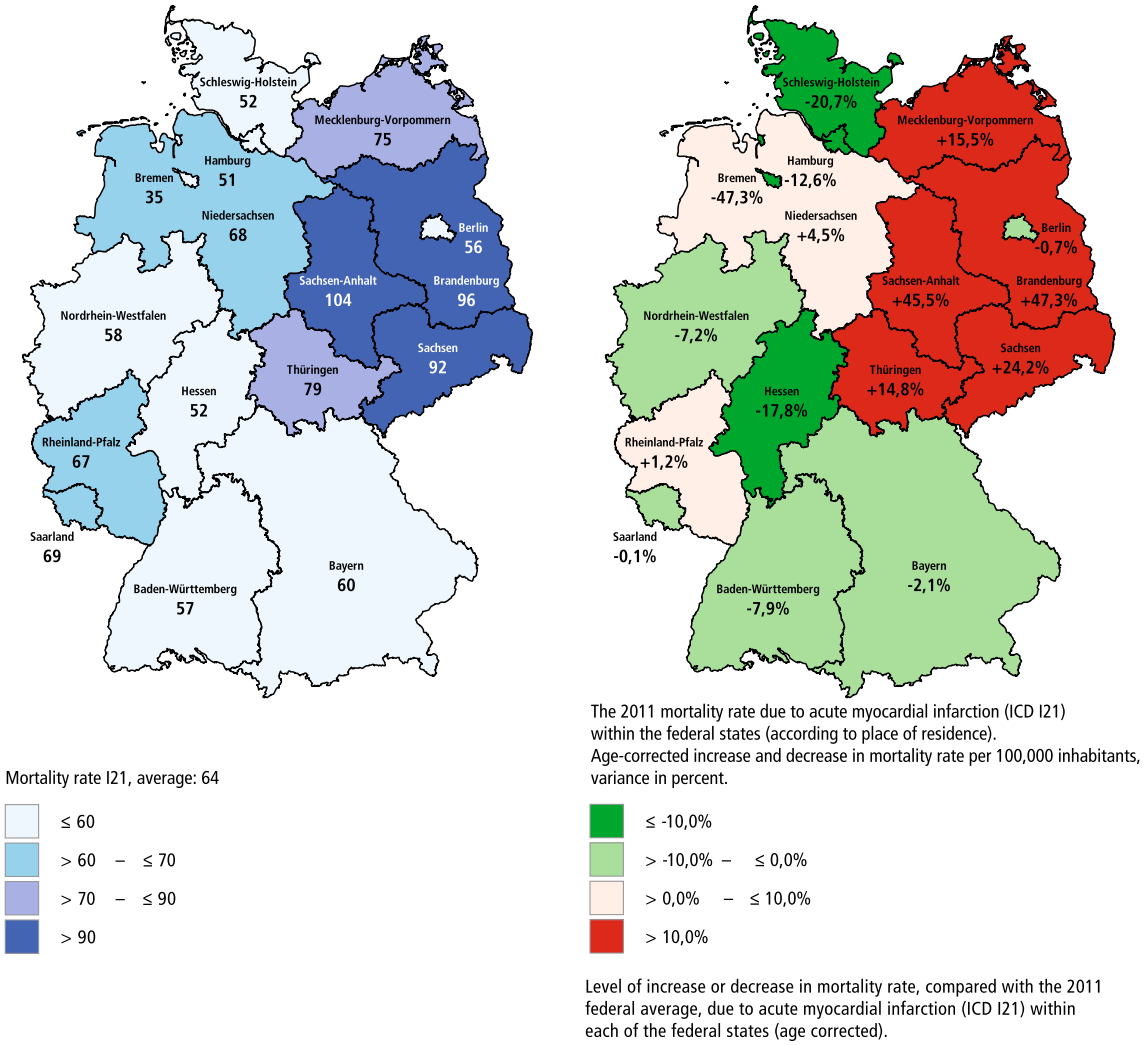

Fig. 3 Mortality rate due to acute myocardial infarction (ICD-10 I21) in 2011 for each federal state. Calculations are based on data from the Federal Statistics Office

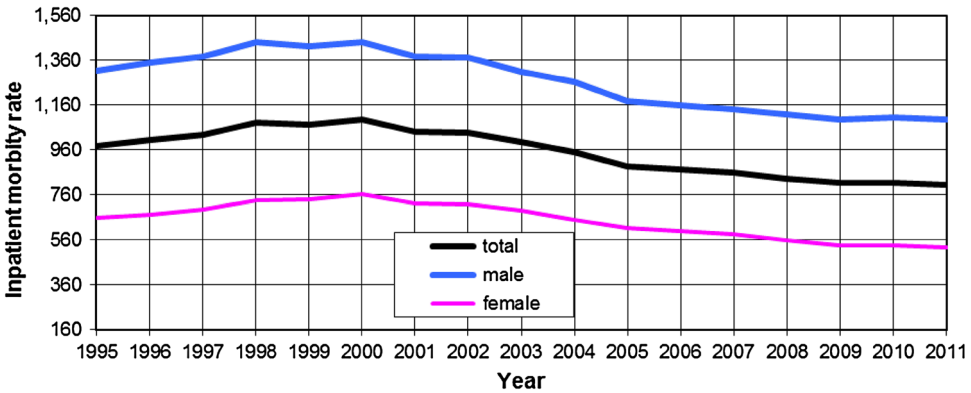

Fig. 4 Trend in inpatient morbidity rates due to ischemic heart disease: 1995–2011. Calculations are based on data from the Federal Statistics Office. Data from 1995 through 2009 are derived from the Heart Report 2010

have improved. In the age group of patients older than 75 years, inpatient morbidity has increased markedly and is currently approximately twice as high compared with the previous decade (Fig. 6). The long-term mortality rate from valvular heart disease has increased continuously since 1980, reaching a peak in 2011 (Fig. 7). Mortality in women due to valvular heart disease is now nearly twice as high compared with that of men.

Treatment of valvular heart disease

In 64.4 % of the 5,622 procedures performed to treat mitral valve insufficiency in 2012, it was possible to preserve the native valve by reconstructing morphology and function (Fig. 8). Since 1995, mitral valve reconstructions have increased and exceed the number of implantations/replacements by nearly two-thirds. For a well-defined small subset of patients with mitral insufficiency with specific contraindications for heart surgery, the transcatheter mitral valve repair may be an alternative according to the ESC/EACTS Guidelines on the management of Valvular Heart Disease (version 2012).

The development of isolated aortic valve replacement (AVR) and transcatheter aortic valve implantation (TAVI) is illustrated in Fig. 9. The frequency of conventional AVR has remained nearly constant from 2007 to 2012. Since 2008, transcatheter aortic valve implantation (TAVI) is increasingly used as an alternative therapeutic procedure, i.e., in patients who are older than 75 years of age unable to undergo surgery or in those for whom surgery has a particularly high risk.

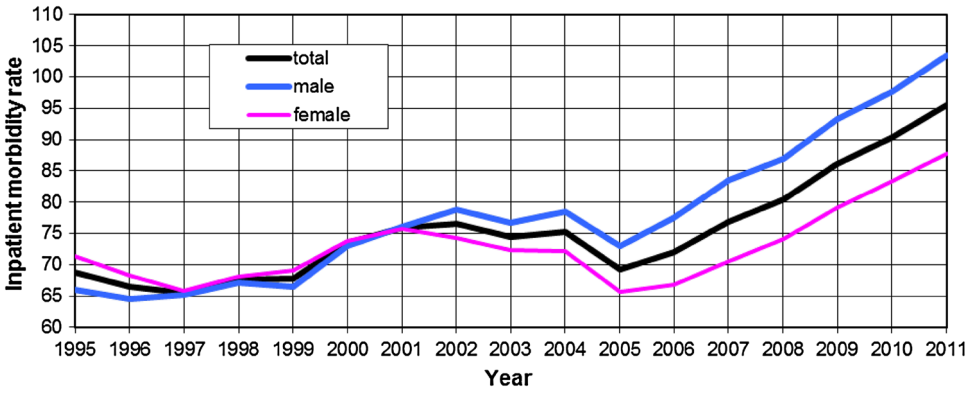

Fig. 5 Trend in inpatient morbidity rates of valvular heart disease: 1995–2011. Calculations are based on data from the Federal Statistics Office. Data from 1995 to 2009 are derived from the Heart Report 2010

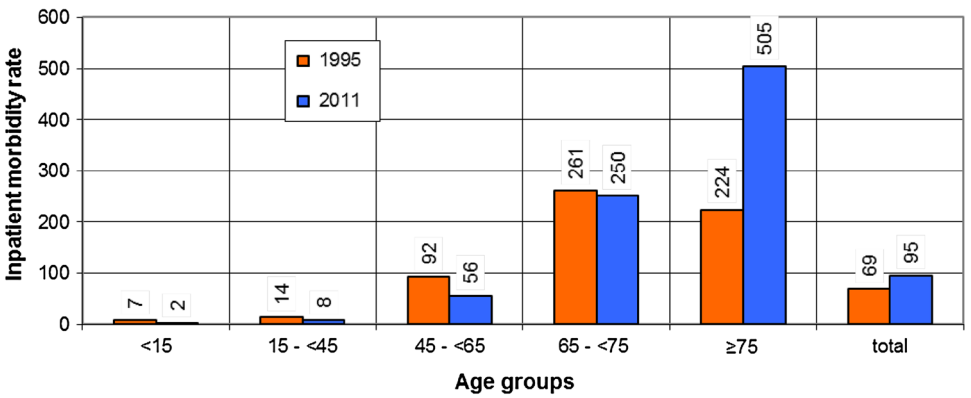

Fig. 6 Comparison of inpatient morbidity rates for valvular heart disease in patients older than 75 years during the period 1995–2011. Calculations are based on data from the Federal Statistics Office. Data from 1995 are derived from the Heart Report 2010

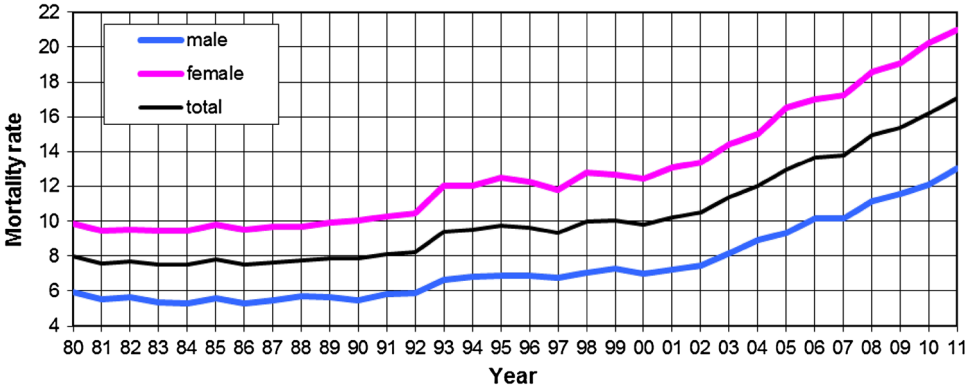

Fig. 7 Trend in mortality rates for valvular heart disease in Germany: 1980–2011. Calculations are based on data from the Federal Statistics Office. Data from 1995 through 2009 are derived from the Heart Report 2010

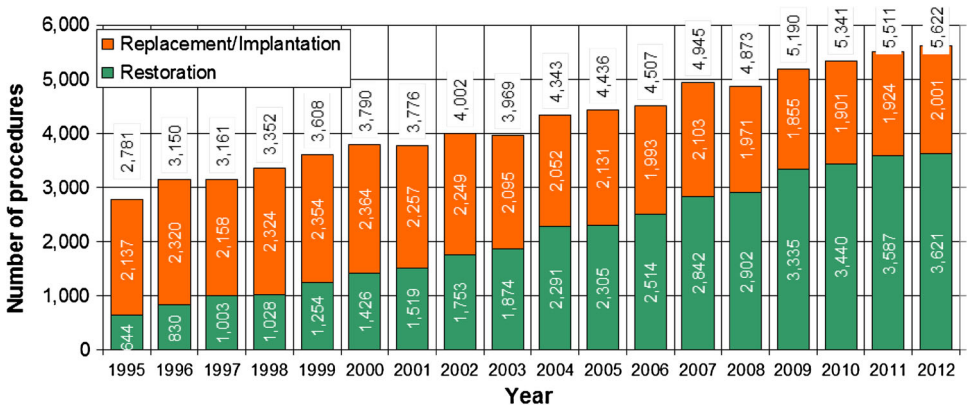

Fig. 8 Trend in mitral valve surgery: 1995–2012. The diagram is based on the annual registry of the German Society for Thoracic and Cardiovascular Surgery. Data from 1995 through 2010 are derived from the Heart Report 2010

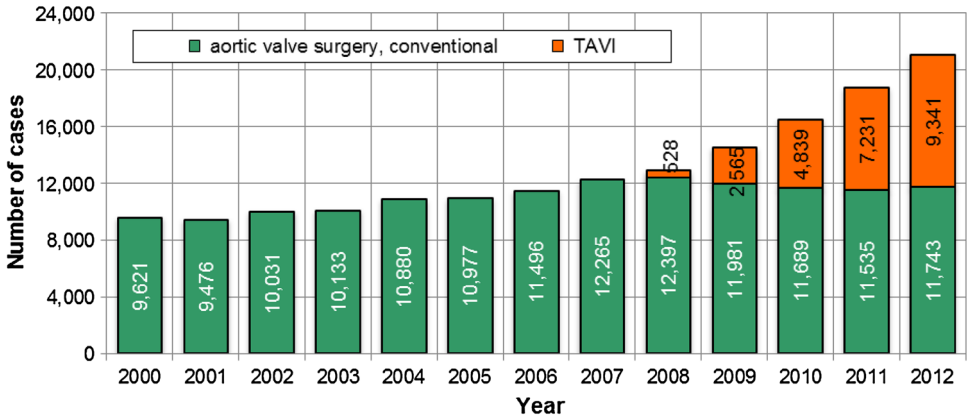

Fig. 9 Conventional AVR and transcatheter aortic valve implantations: 2000–2012. The diagram is based on data from the AQUA Institute (until 2008), BQS Institute, and German Society for Thoracic and Cardiovascular Surgery

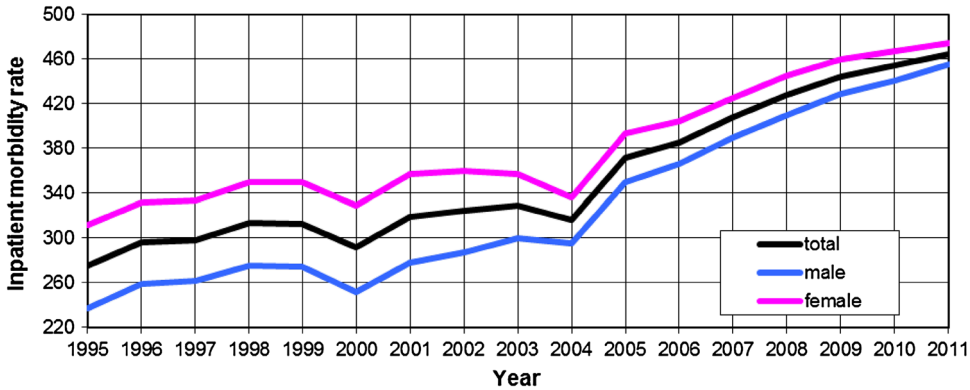

Fig. 10 Trend in inpatient morbidity rates from heart failure: 1995 to 2011. Calculations are based on data from the Federal Statistics Office. Data from 1995 through 2009 are derived from the Heart Report 2010

Heart failure

Morbidity and mortality

The incidence of heart failure has increased over the last several years, with the inpatient morbidity rate showing a nearly linear increase since 2004 after a plateau phase between 1998 and 2004 (Fig. 10). This applies to both genders. Further, the difference in morbidity between men and women has steadily diminished during this period of time. The mortality rate from heart failure is much higher for women than for men, and while it has decreased from 1983 to 2011 overall, the decline has been more prominent for men than for women (Fig. 11).

Mechanical cardiac support and transplantation

The number of patients requiring prolonged mechanical circulatory support systems (MCS) increased from 2,109 in 2011 to 2,618 in 2012; in 1,905 of these patients

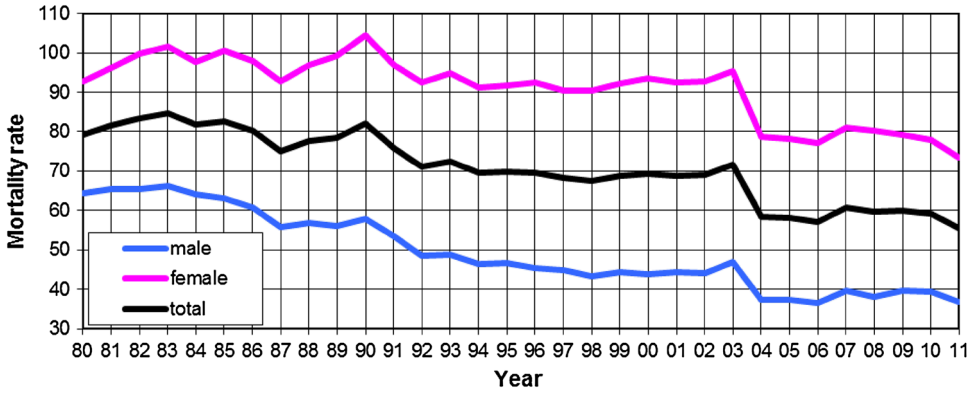

Fig. 11 Trend in mortality rates for heart failure in Germany: 1980–2011. Calculations are based on data from the Federal Statistics Office. Data from 1995 through 2009 are derived from the Heart Report 2010

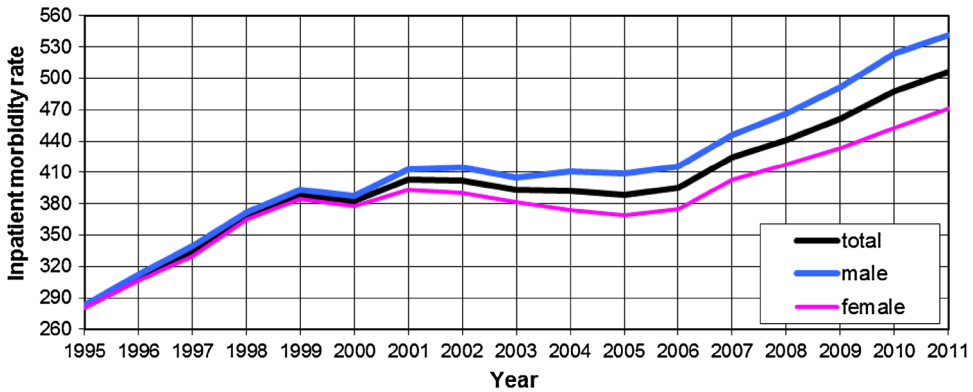

Fig. 12 Trend in inpatient morbidity rates from cardiac arrhythmias: 1995–2011. Calculations are based on data from the Federal Statistics Office. Data from 1995 through 2009 are derived from the Heart Report 2010

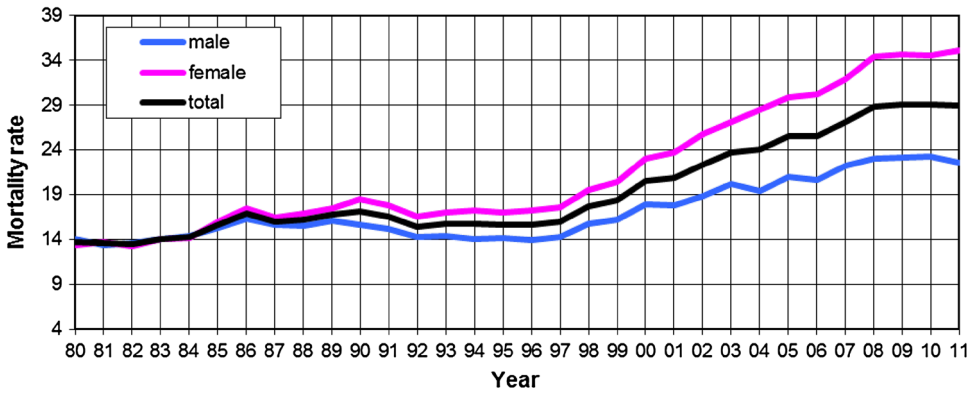

Fig. 13 Trend in mortality rates from cardiac arrhythmias in Germany: 1980–2011. Calculations are based on data from the Federal Statistics Office. Data from 1980 through 2009 are derived from the Heart Report 2010

extracorporeal life-support systems (ECLS) with veno-arterial cannulation were used. While the implantation of a left-ventricular assist device (LVAD) reached an all-time high of 766 in 2012 (up from 601 in 2011), the use of biventricular assist devices (BVAD) declined from 68 to 45, and the number of implantations of a total artificial heart (TAH) declined from 45 in 2007 to 24 in 2011.

The number of heart and combined heart/lung transplantations decreased substantially, from 562 transplantations in 1997 to 346 in 2012. This period includes a plateau of around 400 between 2000 and 2010.

Cardiac arrhythmias

Morbidity and mortality

In 2011, as in previous years, the inpatient morbidity rate markedly increased compared with the preceding year. Since 2000, the increase has been more pronounced in men than in women (Fig. 12). In the early 1980s, the mortality rates for men and women with cardiac arrhythmias were nearly identical (Fig. 13). They then increased over time until reaching a plateau in 2008. Since 1997, there has been a more pronounced increase in the mortality rate in women

than in men; from 1997 to the present, the rate for women has more than doubled.

Diagnosis and procedures

Based on data collected by the German Cardiac Society in 2012, the number of electrophysiological examinations increased from 44,531 in 2011 to 52,441 in 2012, and the number of ablation procedures from 47,797 to 57,012. In contrast, the rate of implantation of pacemaker and cardioverter defibrillator devices (ICD) has remained constant at a level of about 25,000 per year since 2007 in those hospitals that provide cardiac surgery on site. In 2012, the overall numbers of newly implanted pacemakers and ICDs were 76,233 and 29,574, respectively.

Congenital heart defects

Morbidity and mortality

Inpatient morbidity due to congenital defects of the cardiovascular system has been nearly constant for many years (average for Germany: 25.9 per 100,000 inhabitants).

The annual mortality rate for congenital defects of the cardiovascular system declined continuously since 1980 and, as in previous years, has reached a low of 0.6 per 100,000 inhabitants (Fig. 14). In parallel, the life expectancy of patients with congenital heart defects has improved substantially. More than 95 % of the children with mild and moderate heart defects reached adulthood. Even for complex congenital heart defects it is estimated that the percentage of patients who reached adulthood increased from 10 % in the 1950s to 70 % at the end of the last century. Therefore, the number of adults with a congenital heart defect is expected to increase further.

Operations and interventions

Cardiac surgery for congenital heart defects has increased only slightly during the last 15 years. However, catheter interventions have multiplied during the same period (Fig. 15). Hybrid interventions also showed an upward trend.

In the 73 hospitals with cardiac surgery departments, 5,593 cardiac surgeries for congenital heart defects were performed in 2012. Extracorporeal circulation was utilized in 83 %. In 14 clinics more than 150 operations were performed per year; in 19 departments, operations numbered 100 or more (Fig. 16).

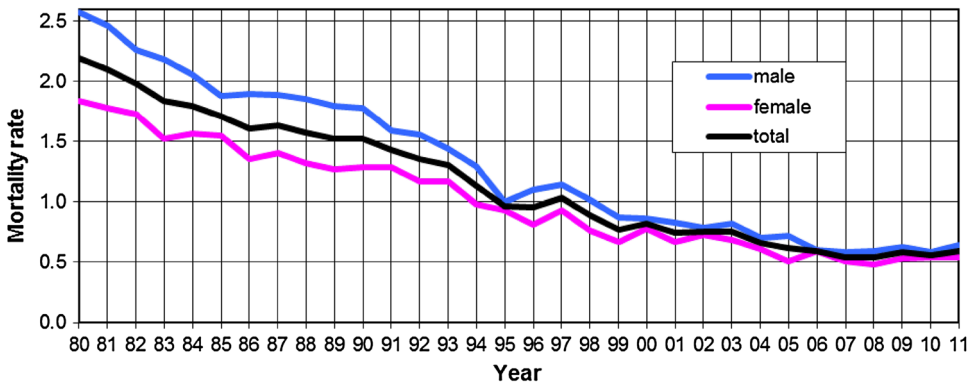

Fig. 14 Trend in mortality rates from congenital heart defects (ICD-10 Q20-Q28) in Germany: 1980–2011. Calculations are based on data from the Federal Statistics Office. Data from 1980 through 2009 are derived from the Heart Report 2010

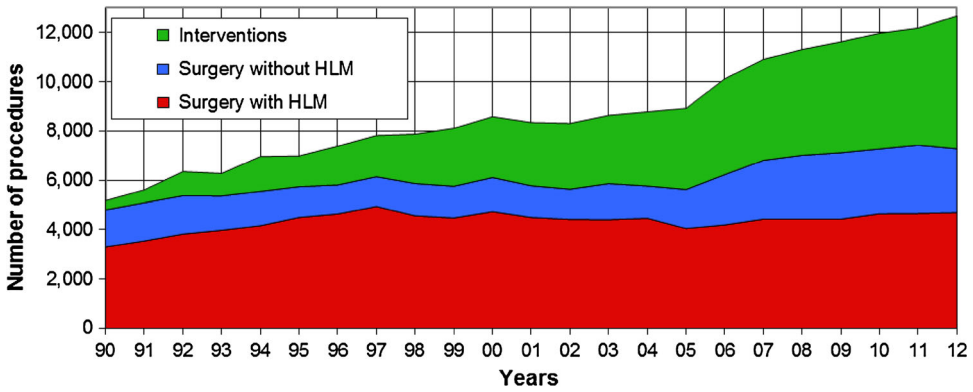

Fig. 15 Surgery with and without extracorporeal circulation (HLM) and other surgical interventions: 1997–2012. The diagram is based on the annual registry of the German Society for Thoracic and Cardiovascular Surgery and of statistics of the German Society of Pediatric Cardiology

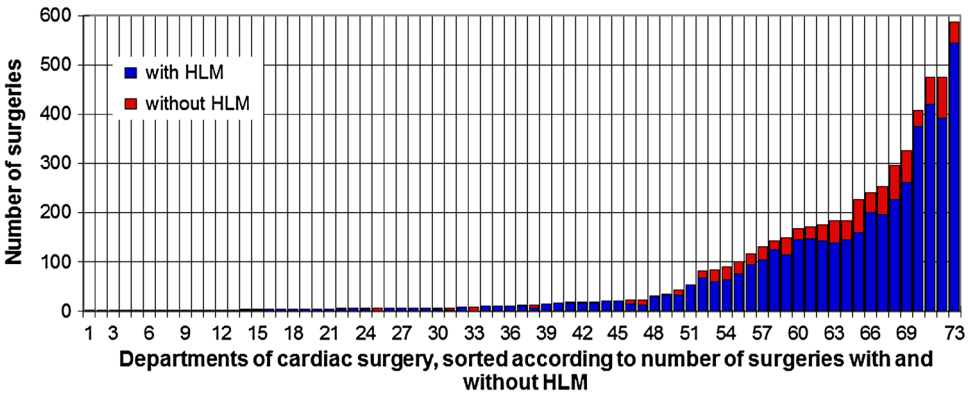

Fig. 16 Cardiac surgery for congenital heart defects in 2012

Discussion

The 25th German Heart Report provides a comprehensive analysis of morbidity and mortality for selected heart diseases as well as of services and care in cardiology, pediatric cardiology, and cardiac surgery in Germany during the period 2011–2012. The rates of morbidity and mortality provide a description of trends over time, on a regional basis, and between different groups of patients based on age or gender.

The trends in morbidity due to cardiac diseases in 2010 and previous years continued in 2011. This confirms the results of the 2011 Heart Report, which had compared data of the period between 1995 and 2010.

These trends may be summarized as follows:

- a slight decrease in coronary heart disease in every age group
- a distinct increase in valvular diseases, predominantly at age >75 years
- an increase in arrhythmias from the age of 45 years onwards
- an increase in cardiac failure, especially beyond the age of 75 years.

Compared with data from 2009, the mortality rates in 2011 differed somewhat:

- a decrease in deaths due to heart failure and coronary heart disease
- no change in mortality due to arrhythmias
- a distinct increase in death due to valvular heart diseases
- a slight decrease in mortality based on congenital heart defects.

These data are in agreement with findings from other Western countries.

Coronary heart disease, the most frequent cardiac disease, has continuously decreased in frequency and as a cause of mortality since 2000. The underlying reasons are probably related to improved prevention, early diagnosis, and better therapy of outpatients and inpatients, i.e., the broad use of drug-eluting stents, thrombolysis, emergency PCI, timely CABG procedures, and reduction of pre-hospital time for acute coronary syndrome as well as increased outpatient diagnosis and treatment. According to the FAST-MI program, the improvement of early mortality after STEMI is related to changes in patient profile as well as improved organization of care [11]. The figures may also be influenced by changes in definitions or coding of diseases apart from epidemiological and medical trends.

It is difficult to explain the differences in the mortality rates from coronary heart disease between and within the German federal states—i.e., the reduction from 87 to 35 in Bremen (Fig. 3/2 of the original GHR) within one year parallel to an increase in the morbidity rate of acute myocardial infarction from 342 to 379 (Fig. 3). Such changes may also be due to modifications in coding. For Bremen, one must consider the relatively small number of patients. In this case, changes in one coding office can immediately impact the total result. Changes in admission behavior may have had some influence as well.

The modified definition of myocardial infarction, which is slowly being adopted in statistical analyses, has to be considered. In addition, the more favorable short-term prognosis of patients with non-ST elevation myocardial infarction might be due to the fact that through the use of high-sensitivity troponin assays, more patients are classified as non-ST elevation myocardial infarction cases than in previous reports. In addition a high-sensitivity cardiac troponin T assay allows an earlier diagnosis of non-ST elevation myocardial infarction [12]. It is not very likely, however, that the differences in the mortality rates for patients with coronary heart disease between the "old" and "new" federal states are due to different coding practices. Social–medical reasons like knowledge about symptoms of infarction and logistic differences for emergency cases—such as prolonged pre-hospital time or longer waits before

being transferred to the next hospital to rescue PCI and urgent CABG procedures—may explain these differences.

Quite remarkable is the evolution of transcatheter aortic valve implantations (TAVI). Since 2008, the number of TAVI procedures increased steadily over and above conventional AVR. International guidelines and other recommendations of scientific medical societies suggest that these procedures should be performed by a cardiac surgeon and a cardiologist working together as an interdisciplinary heart team. Both the decision-making and the technical procedure together with the entire perioperative treatment should be performed within this competent interdisciplinary team. For the time being, this interventional technique is reserved for selected patients who cannot undergo cardiac surgery or are at very high risk of surgical complications. It is out of question that more widespread use of such interventions via catheter must be first investigated by clinical trials (for example, the use in younger patients or in patients with only a moderately higher surgical risk). In addition, it will be important to have further information about the long-term durability of the implanted valves.

The increase in morbidity of valvular heart diseases can be explained by the increased life expectancy, the more frequent and simple diagnostics by echocardiography, and the extended therapeutic options (TAVI, transcatheter mitral valve repair). The increased mortality rate due to valvular diseases, however, cannot be easily explained by the data. One of the main reasons may be the fact that during the last years the indication for valve replacement was extended to elder and sicker patients, who could not be operated in the past and who have a higher mortality per se. Demographic changes, the overall higher life expectancy, or improved clinical diagnostics of valvular heart disease may have some additional reasons that lead to a more frequent diagnosis of heart valve disease as the cause of death.

It can be assumed that invasive cardiac procedures prolong the life expectancy of individual patients. Of course, the same patients will die later, possibly from other, non-cardiac diseases. In patients who have undergone previous valve procedures, the cause of death may be assumed to be cardiac valve related and are documented in the statistical reports accordingly.

The increased inpatient morbidity seen in heart failure patients may stem from diverse causes such as increased life expectancy and the prolonged life of patients who have received good care for cardiac diseases. Improved diagnostic may play an additional role—in the EVITA-HF registry 68 % of consecutive hospitalized patients with heart failure had a non-elective admission [13]. The usage of phase-control cardiac magnetic resonance imaging to determine left ventricular diastolic function may serve as an additional example [14]. The decline in the mortality rate due to heart failure is probably the result of improved therapy as described in the EVITA-HF registry, and extended treatment options like cardiac synchronization therapy which can delay the disease progression in mildly symptomatic heart failure patients [11].

Improved diagnosis and, consequently, more frequently documented diagnosis of cardiac arrhythmias may be the reason for the increased morbidity associated with arrhythmias. Unfortunately, specific rhythm conditions such as atrial fibrillation, supraventricular tachycardia, and ventricular tachycardia were not distinguished in the analysis. Therefore, an interpretation of the data is not possible with regard to the distribution of specific cardiac arrhythmias.

From a present-day perspective, the obvious increase in the mortality rate for arrhythmias between 1996 and 2008 seems almost paradoxical considering the improved therapeutic alternatives compared with those available 20 years ago. These include improved diagnostic and therapeutic tools, for example, the use of ICDs or improved therapy of the disease underlying the arrhythmia. In the EVITA-HF registry patients with ejection fraction <40 % received—beyond pharmacotherapy—in 39 % advice therapy, 5 % ablation procedures and at discharge 33 % had ICD or CRT implants [13]. Such capabilities should decrease the mortality rate. However, cardiac arrhythmias are more frequently diagnosed today and consequently more often assumed to be the cause of death. The appropriate therapy for the underlying disease often does not remediate the arrhythmia as the cause of death but instead shifts it to a later age. In addition, there seems to be a trend towards treating more complex arrhythmias than 10–15 years ago. Due to the lack of evidence the phenomenon merits further research.

As far as pacemakers and ICDs are concerned, it has also to be considered that there are a remarkable number of primary implantations of such devices in hospitals without cardiac departments.

The dramatic reduction in mortality for congenital heart defects over the last 20 years can be attributed to improvements in both surgical and catheter-based techniques. The fact that inpatient morbidity did not substantially decline during the last decade is an indirect hint that in spite of considerable improvements in prenatal diagnostics, the number of children born with a congenital defect has not decreased.

The number of surgical procedures per congenital center and even per physician is a matter of discussion with regard to quality issues. Considering this, the high number of hospitals with less than 100 pediatric cardiac surgeries per year is a cause for concern. It is generally agreed that each congenital surgical program should have two experienced surgeons available. Under the assumption that two cases

per week are necessary to maintain surgical quality, a total number of 200 cases per center and year should be performed in a congenital surgical program to maintain a rating of excellence. A further concentration of resources seems warranted.

Strengths

The German Heart report provides comprehensive data from different sources about common cardiac diseases and related diagnostic and therapeutic procedures. This report is the product of a multidisciplinary approach by a consortium of different scientific bodies in Germany.

Limitations

Differences in the classification, collection, completeness, or aggregation of data or the presence of various interfaces may have distorted the results. In Germany any healthcare research is limited by the federal structure of the country, which results in a lack of uniform and consistent data collection and makes it difficult to provide an absolutely valid analysis of morbidity rates. Thus, information about morbidity is available for inpatients only. Furthermore, even official data may be misleading. For example, the official statistics about causes of death strongly depend on the correctness of the diagnosis and its classification.

It must also be considered that the perception of indications and causes of death may have been changed by additional diagnostic and therapeutic options. This would impact the assessment of cause of death. In addition, the reimbursement system and its changes may influence inpatient morbidity data, for example, "heart failure" as a factor of augmentation of the reimbursement for an underlying disease.

Some other countries such as Denmark (Danish National Registry of Patients) [15] Sweden (SWEDEHEART registries) [16], and The Netherlands may provide good examples of well-established data collection practices. In these countries, a central registration of the healthcare system is available as a basis for healthcare research, including history, inpatient treatment records, and information about death for every patient. Even for these countries, the following holds true:

The studies show that the validity of the administrative data and the overall data concerning procedures is high, although large differences are seen for specific diagnoses [17–19].

Resume

The German Heart Report provides comprehensive information regarding health services for patients with common cardiac diseases. The report is the result of a multidisciplinary collaboration between the German Heart Foundation, the German Cardiac Society, the German Society for Thoracic and Cardiovascular Surgery, and the German Society of Pediatric Cardiology. This is especially important in view of the federal structure of the German healthcare system; there are only a few national databases available, so various data sources have to be taken into account. The report is an important resource for anyone interested in data regarding heart disease conditions and their treatment in Germany, including stakeholders in healthcare politics.

Conflict of interest Thomas Meinertz, Anno Diegeler, Brigitte Stiller, Eckart Fleck, Markus K. Heinemann, Achim A. Schmaltz, Martin Vestweber, Kurt Bestehorn, Andreas Beckmann, Christian Hamm, Jochen Cremer states that there are no conflicts of interest.

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