



# Prevalence of heart failure in Germany – nationwide trends, regional variation, and frequent comorbidities

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## Abstract

### Background

Heart failure (HF) is a severe clinical syndrome which is associated with high health care expenditure and mortality. In Germany hospital admissions due to HF are steadily rising most likely on account of increasing population prevalence. Previous German studies show marked variations of prevalence estimates due to differences of case definitions, studied years and risk profiles of included source populations. So far the extent of regional variation among German federal states is unknown. This study aimed to estimate annual heart failure prevalence in the years 2009 to 2017 and to examine its regional differences. In addition, the HF-specific profile of comorbidities was examined.

### Methods

Using a full sample of nationwide claims data covering ambulatory care of approximately 87% of the German population annual HF prevalence in Germany was estimated from 2009 to 2017 and for each Federal State in 2017. Patients were identified as HF cases if they received ambulatory HF diagnoses in two quarters of a given year. Two-level logistic regression was employed to examine the influence of the district level variables social deprivation and degree of urbanity on diagnosis of HF, adjusted for age and sex. To study HF specific comorbidities HF patients were randomly matched to disease-free controls for age, sex and Federal State.

### Results

In 2017 HF prevalence was 3.4%, amounting to roughly 2.5 million affected persons. Over the course of the study the crude prevalence increased by about 17% (men: 33%, women: 6%). Age- and sex-standardized prevalence rose substantially in men (17%). All studied comorbidities showed considerably higher prevalence in HF patients compared to controls, including hypertension, diabetes, ischaemic and inflammatory heart disease, dementia and renal failure. The risk of experiencing HF was 40% higher among inhabitants of the most rural districts in contrast to large cities (OR: 1.40; 99%-CI: 1.24–1.59).

### Conclusion

The increasing prevalence of heart failure in Germany constitutes a major public health burden. Independent of population demographics, areas with low population density showed the highest HF prevalence, which adds to the challenge of ensuring universal access to health services in rural German regions. Further research is needed to investigate factors driving the rise of age- and sex-standardized prevalence in men.

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#### Keywords

Diagnosis prevalence, case-control study, heart failure, comorbidity, prevalence, risk analysis

#### Citation

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