

# **Differences in Avoidable Mortality between Urban and Rural Regions in the German Baltic Sea Area since Reunification – Trends, Patterns and Explanations**

**Michael Mühlichen<sup>1</sup>**

## **1. Introduction**

There are considerable regional mortality differences in Germany. Concerning average life expectancy at birth, the eastern and northern regions rank below the western and southern part of the country. Consequently, in the northeastern-most state of Mecklenburg-Vorpommern (MV)<sup>2</sup> average life expectancy is lower than in most other German federal states, also in comparison to its western neighboring state of Schleswig-Holstein (SH) although – with its special position as a popular recreational and holiday destination – it actually possesses favorable prerequisites for long life (e.g. good air quality, little industry, seaside location, many lakes and forests). One reason for this finding is the period of German partition from 1949 to 1990. As a result of the Second World War not only Germany as a whole but the German Baltic Sea area as well were divided: MV became a territory of the German Democratic Republic (GDR) and SH became a part of the Federal Republic of Germany (FRG). In this time, two different health systems developed and the one of the GDR increasingly became antiquated in comparison to the FRG regarding medical technology (Dinkel 2003). Different political, economic and social conditions developed in both German countries as well (Gjonça et al. 2000; Luy 2004). Thus, the difference in life expectancy between both regions grew to the disadvantage of the GDR territory. After reunification this difference decreased again but has not yet been completely vanished. The consequences of political separation and reunification for health and life expectancy have the unique character of a ‘natural experiment’ in mortality research (Vaupel et al. 2003; Vogt & Vaupel 2015), even more with regard to the German Baltic Sea area because of the geographic, historical, economic and cultural commonalities in this region than total East-West differences which are partly a result of the north-south gradient in mortality.

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<sup>1</sup> Federal Institute for Population Research, Friedrich-Ebert-Allee 4, 65185 Wiesbaden, Germany. E-Mail: michael.muehlichen@bib.bund.de.

<sup>2</sup> Vorpommern is also referred to as West Pomerania, Western Pomerania or Hither Pomerania.

The paper's objective is to ascertain the changes in cause-specific standardized death rates in Mecklenburg-Vorpommern and Schleswig-Holstein since reunification. In addition, using official data on causes of death, the effectiveness of health care and inter-sectoral health policies is measured by the concept of avoidable mortality. In order to examine if the urban-rural gradient in mortality that developed during the GDR era is still evident and influences mortality differentials between both states, all analyses are conducted for urban and rural areas each via the method of decomposition for the periods of 1990-1994 and 2007-2011.

## **2. Data and Methods**

The data basis of the following analyses are the official year-end population numbers according to sex, age and district for the period of 1989 to 2011, delivered by the statistical offices of Mecklenburg-Vorpommern and Schleswig-Holstein, and the official cause of death statistics that include all deaths according to sex, age, district and cause of death from 1990 to 2011, delivered by the Research Data Center of the Statistical Offices of the Federal States.

The districts have been aggregated into the following regions: Urban districts of Mecklenburg-Vorpommern (Urban MV), rural districts of Mecklenburg-Vorpommern (Rural MV), urban districts of Schleswig-Holstein (Urban SH) and rural districts of Schleswig-Holstein (Rural SH). The composition of these regions is based on the territorial status before 4 September 2011.

The selection of causes of death follows the concept of 'avoidable' mortality. Avoidable deaths can be divided into causes amenable to medical or health care and into causes avoidable through primary prevention. Whereas amenable mortality can be considered as an indicator for the impact of health care through secondary prevention or medical treatment, preventable mortality can be considered as an indicator for the impact of inter-sectoral health policies in the broad sense and largely reflects risk-relevant behavior of the population (Nolte et al. 2002). Classifying avoidable conditions, this paper follows the approach to use a list of conditions that 1) is as complete as possible, thus delivering sufficient numbers for regionalized analyses, 2) includes both amenable and preventable causes of death and 3) allows for the limited use of three-digit codes as four-and-more-digit codes are not easily accessible in district-level data. The list for amenable causes is primarily based on Nolte & McKee (2004), the most wide-spread classification. Additional conditions including age limits were taken mostly from Page et al. (2006), some from Plug et al. (2011) and Tobias et al. (2010) as well. The list for preventable causes is based on Page et al. (2006) and Tobias &

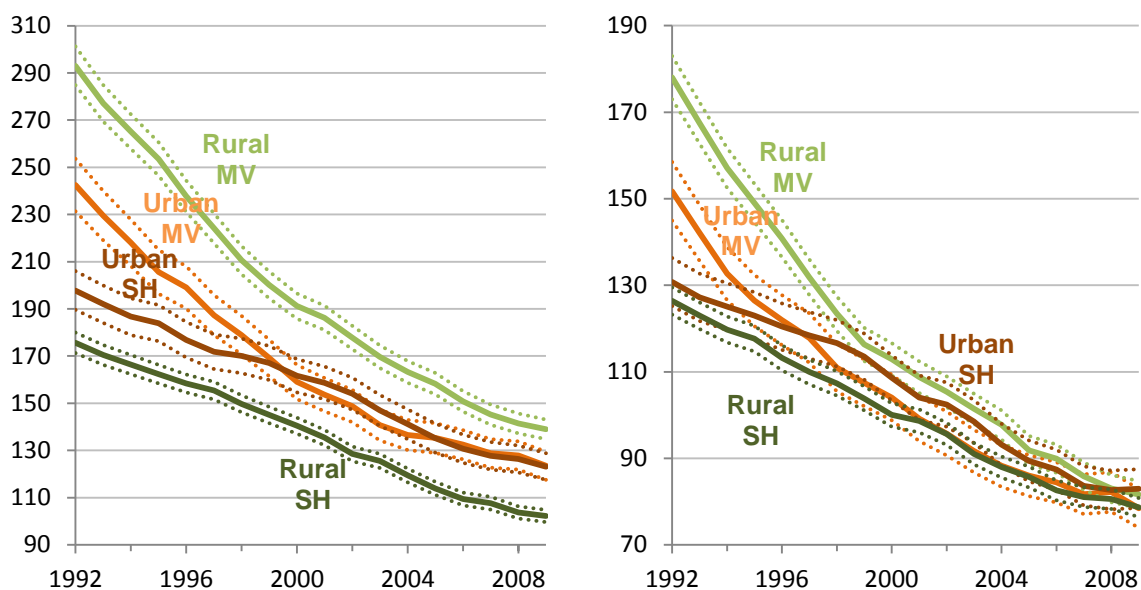
Jackson (2001). Little deviations from the cited publications were done to reach a better compatibility between ICD-9 and ICD-10, especially when access is limited to three-digit codes. The general upper age limit was set to 75 years “as ‘avoidability’ of death and reliability of death certification become increasingly questionable at older ages” (Nolte & McKee 2004: 65).

In order to show cause-specific mortality differences in their development over time and between regions and sex, without being distorted by compositional effects, standardized death rates are the most suitable practice. Thus, death rates with a directly standardized age and sex structure were calculated for each region differentiated by sex and cause of death groups.

Another practice to measure mortality differences is the decomposition method. Whereas, the standardization method eliminates the compositional impact on death rates by using an arbitrary standard population, the purpose of decomposition analysis is to measure the difference between the true, observed death rates in terms of both, differences in mortality (direct component) as well as differences in age structure (compositional component). The decomposition analysis used in this paper is based on Kitagawa (1955).

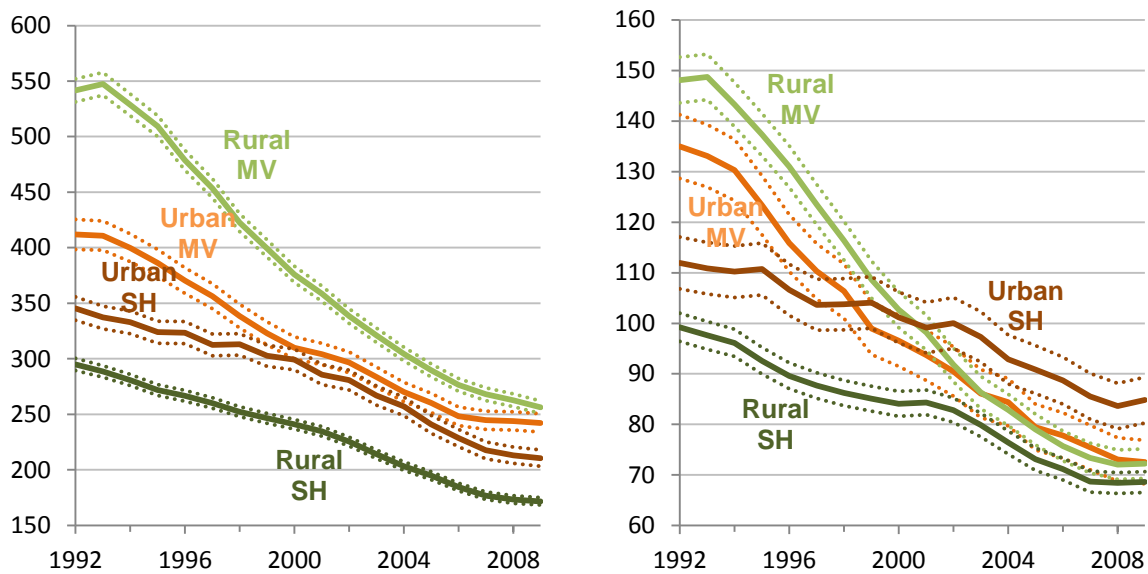
### 3. Results

**Figure 1: Amenable mortality in urban and rural regions of Mecklenburg-Vorpommern (MV) and Schleswig-Holstein (SH), standardized death rate, years 1992-2009, 5-year values, men (left) and women (right)**



Source: Forschungsdatenzentrum der Statistischen Ämter des Bundes und der Länder, Statistikamt Nord, Statistisches Amt Mecklenburg-Vorpommern (own calculations)

**Figure 2: Preventable mortality in urban and rural regions of Mecklenburg-Vorpommern (MV) and Schleswig-Holstein (SH), standardized death rate, years 1992-2009, 5-year values, men (left) and women (right)**



Source: Forschungsdatenzentrum der Statistischen Ämter des Bundes und der Länder, Statistikamt Nord, Statistisches Amt Mecklenburg-Vorpommern (own calculations)

#### 4. Conclusion

This paper shows that the mortality differences in the German Baltic Sea area primarily concern men, and there it is especially due to an urban-rural gradient in MV: Whereas the urban regions of MV have reached the mortality level of the urban areas of SH in recent years, the rural areas of MV still show a significantly higher mortality level than the other regions. On the one hand, these regional differences in men are caused by a higher mortality from causes amenable to health care. On the other hand, even the urban regions of MV still exhibit a significantly higher mortality from causes that should be avoidable through primary prevention. The results show that the accessibility of medical care in the thinly populated areas of MV is still improvable and that health policies should focus more on men and preventing risky behavior, especially smoking and alcohol abuse.

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