

# Widening socioeconomic mortality gradient in Germany and its implication for the closing East-West mortality gap

Eva Kibele, Population Research Centre, University of Groningen, The Netherlands, e.u.b.kibele@rug.nl

Domantas Jasilionis, Max Planck Institute for Demographic Research, Rostock, Germany

Vladimir Shkolnikov, Max Planck Institute for Demographic Research, Rostock, Germany

## Abstract

Widening socioeconomic mortality gradients have been found in many European countries, ranging from supposedly egalitarian countries in Northern Europe to the Eastern European countries which have undergone great societal changes in the past few decades. This study seeks to find out how the socioeconomic mortality gradient developed among the elderly in Germany. In particular, the socioeconomic mortality gradients in eastern and western Germany and their trends are studied in order to see whether and how the differential mortality trends in population groups contributed to the closing East-West mortality gap in Germany. Mortality trends of the male population aged 65+ years in Germany over the years 1995-96 to 2007-08 are studied using data of the German Federal Pension Fund that cover over 80% of the retired German population. Former occupation and pension income are used as an indicator of socioeconomic status. The results reveal that the mortality risk is higher among people with a lower SES compared to lower mortality of people with higher SES. This difference has increased between 1995-96 and 2007-08, showing a widening of the old-age mortality gradient. Pronounced mortality reductions in the population with high socioeconomic status in eastern Germany greatly contributed to the mortality decrease in eastern Germany, and hence to the life expectancy convergence between the eastern and the western part of Germany.

## Introduction

Substantial mortality differentials between socioeconomic groups and widening inter-group mortality inequality over the past few decades have been detected in many European countries (Huisman et al., 2004; Kunst et al., 2004; Mackenbach et al., 2003). Even supposedly egalitarian countries in Northern Europe have mortality differences between population groups, which are increasing. Particularly large socioeconomic mortality differences are found in Eastern European countries (Leinsalu et al., 2009; Shkolnikov et al., 2006, 2012).

Also in Germany, the existence of a gradient in morbidity and mortality between socioeconomic groups has been documented (Lampert and Kroll, 2006; Reil-Held, 2000; Shkolnikov et al., 2008). There is however little evidence on changes in

mortality inequalities in Germany and especially how they differ between eastern and western Germany.

The East German excess mortality and the diminishing East-West life expectancy gap after the German reunification have been studied extensively. In respective studies, accelerated mortality decline among eastern Germans after reunification was analyzed in the whole population of eastern Germany (Diehl, 2008; Vaupel et al., 2003; Kibele&Scholz, 2008) with special emphasis on the mortality decline among the elderly.

Given this background, the paper systematically examines temporal changes in the socioeconomic mortality gradient among the elderly population in Germany. In particular, we are interested whether there are distinct East-West differences in the socioeconomic mortality gradient that can be linked to the closing of the East-West mortality gap in Germany.

## Data & Methods

Data on population and death counts for the population aged 65 years and older were obtained by the German Federal Pension Fund for the years 1995-96 to 2007-08. It includes all people who receive an old-age pension. Information about the age, sex, place of residence (eastern or western Germany), pension income (7 income groups; the group with lowest pension income is disregarded in the analyses as this group is heterogeneous with poor pensioners, but also pensioners receiving additional incomes from self-employment and other sources) and former occupation (employee, worker, or miner; data on occupational group available until 2003-04) is available for the population under study. These characteristics are less meaningful for women and non-German nationals as both groups may encounter greater interruptions in their working career. The analyses therefore focus on mortality trends among German men (cf. Shkolnikov et al., 2008). On average, there more than 9 million in the population under study at each time point (1995-96, 1999-2000, 2003-04, 2007-08) and about half a million deaths. About 51% of the population has been working as a manual worker, 42% as an employee, and 8% as a miner. The groups of pensioners with the lowest and the highest pension incomes considered both comprise of about 14% of the study population. Mortality risks were estimated by Poisson regression analysis.

## Results

There is a socioeconomic mortality gradient in the population aged 65+ years in Germany, as well as in eastern and western Germany in the period from 1995-96 to 2007-08. Former blue-collar workers have a higher mortality risk, in both eastern and western Germany. The gradient of workers' to employees' mortality rises from 1.23 to 1.43 in western Germany and from 1.15 to 1.30 in eastern Germany in the period from 1995-96 to 2003-04. The mortality risk of former miners, both in eastern and

western Germany, is higher than that for employees, but lower than the mortality risk of former manual workers. The mortality gradient by pension income is even steeper than the occupational mortality gradient. In western Germany, pensioners with a low pension income have 45% higher mortality compared to the group with high pension income in 1995-96. In 2007-08, the excess mortality constitutes 76%. The respective figures for eastern Germans are 48 and 107%.

Mortality declined in all population groups over time. Differences in the mortality declines between eastern and western Germany and between the population groups exist. Eastern Germany experienced the greatest mortality declines over time. Among population groups, those with the highest SES—employees and those with a high pension income—had the greatest mortality declines. High SES pensioners in eastern Germany thereby benefitted from the strongest mortality declines of 40% (highest pension income group) and 21% (employees).

## Conclusion

Our analyses reveal clear trends in the socioeconomic mortality gradient among elderly men in Germany. Although the data represent administrative data covering a large part, though not all, of the elderly population, our results are believed to be of high quality. The socioeconomic mortality gradient could, however, be underestimated to a small extent.

The group of elderly with higher socioeconomic status, as expressed by the former occupation and pension income, experienced a steeper mortality decrease. The progress was most pronounced among the elderly living in eastern Germany. This contributed to a widening social mortality gradient over the 1990s and 2000s. The occupational mortality gradient is now at a comparable level in eastern and western Germany, the income mortality gradient is larger in eastern Germany.

Strong mortality declines in the group of elderly with high socioeconomic status in eastern Germany contributed greatly to the old-age mortality decline in eastern Germany, and hence to the shrinking of the East-West life expectancy gap within Germany. How mortality trends in different population groups contributed to the East-West mortality convergence has not been studied yet. This research shows that a more even mortality decline in all population groups would have resulted in a faster and stronger East-West mortality convergence in Germany.

Similar to trends in Eastern European countries, the mortality gradient has widened mostly in eastern Germany. This is expressed in a decelerated mortality decline among elderly with a low socioeconomic status and to an accelerated mortality decline among people with a higher socioeconomic status. Future research should investigate why both an accelerated and decelerated mortality decline took place in different population groups in East Germany, also by looking at different measures of socioeconomic status. Questions arise whether the observed mortality disparities

reflect current socioeconomic circumstances or whether they reflect differences in the accumulation of risks over the life course.

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