Life expectancy and life expectancy lost: (dis-)similarities across Germany's regions over time
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1 Introduction

Mortality differences across Germany's federal regions persist. In terms of life expectancy in 2006, the best-performing state–Baden-Württemberg–experiences life expectancy of 78.6 years for males and 83.5 years for females respectively. Those states with the lowest life expectancy have values about 3.5 years respectively 2.2 years below.

This research explores which regions in Germany exhibit the most favorable mortality pattern, expressed in life expectancy and in life expectancy lost. Age groups and causes of death which determine the patterns are defined.

2 Data and Methods

Data for the German federal states on population, deaths by causes and by age covers the period 1980-2006 (if available). Data is provided by the German Regional Statistical Offices.

For the analysis of the regional mortality inequalities, the measures of life expectancy (e_x) and life expectancy lost ($e_x^\dagger$), expressing the inequality in age at death, are applied. The latter is based on the distribution of deaths in the life table and is derived from the life table deaths at age x weighted by the average remaining life expectancy. It indicates how many years of life on average are lost if one death occurs. Mortality advances depend on the average rate of mortality decline as well as on its age pattern (Vaupel and Canudas Romo, 2003). Differences in both measures at different time points or between different geographical entities are

decomposable by age and causes of death (Shkolnikov et al., 2003). Life expectancy and inequality in age at death show a strong negative relationship in general (Wilmoth and Horiuchi, 1999).

3 Findings

Applying these measures to the mortality trends in East and West Germany, one can see that just as life expectancy is continuously increasing over time, life expectancy lost as measured by $e_x^\dagger$ is continuously decreasing. Life expectancy in East Germany has long been lagging behind West German levels, the gap became even wider when East German life expectancy fell around the time of the German unification in 1990, mostly due to excess mortality in young adult ages. Mortality in East Germany, however, declined faster than before and faster in comparison to West Germany in subsequent years. Trends in life expectancy lost are the reverse: an initial increase of inequality around unification is followed by a stronger decline thereafter.

Turning to mortality at regional level (figure 1), over time life expectancy differences and differences in life expectancy lost among the West German federal states are rather stable. Baden-Württemberg, Bavaria, and Hesse are the forerunners with lowest mortality and lowest levels of life expectancy lost and Saarland takes the last rank. Life expectancy in the East German states is generally below the West German level, as inequality levels are above. Saxony takes the most favorable rank with highest life expectancy and lowest inequality, opposed to Saxony-Anhalt and Mecklenburg-Western Pomerania on the bottom line.

Both life expectancy as well as life expectancy lost across the German federal states have been converging. Since the late 1990s, differences between federal states in life expectancy and life expectancy lost are stable and no longer converging.

Causes of death behind this development are mainly big groups of causes comprising cardiovascular mortality and cancer mortality, which declined to a large extent. In all of the West German federal states, progress in bringing external mortality rates down was achieved during the 1980s. External mortality, being at higher levels in the East German states in 1990, decreased rapidly in East Germany during the 1990s.

Differences both in life expectancy and in life expectancy lost across the German federal states are smaller for women. Most ad-

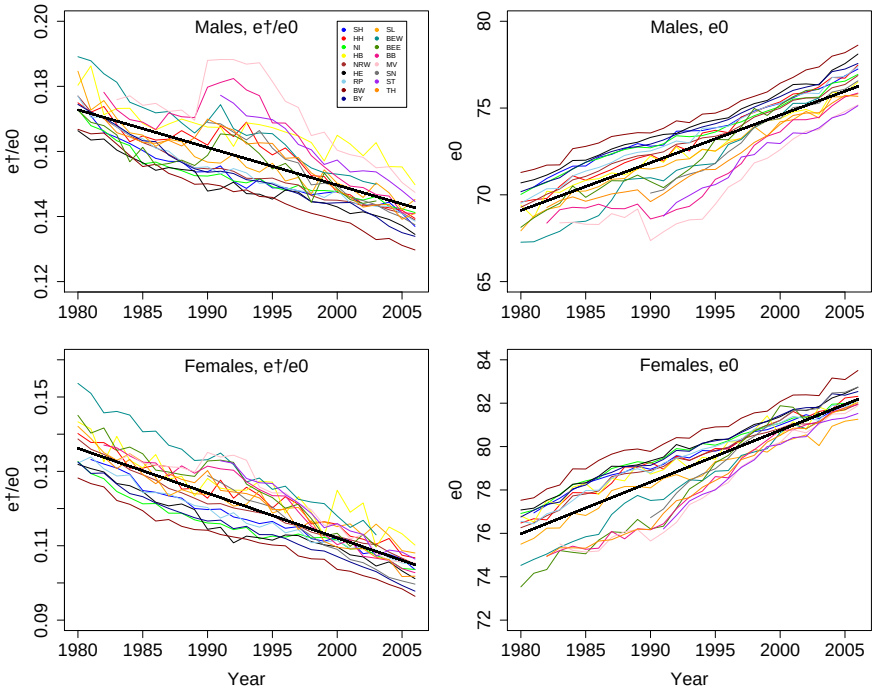

Figure 1: Relative $e_0^\dagger$ ($e_0^\dagger/e_0$) and e_0 1980-2006 with fitted regression line over all values; males and females; SH-Schleswig-Holstein, HH-Hamburg, NI-Niedersachsen, HB-Bremen, NRW-Northrhine-Westphalia, HE-Hesse, RP-Rhineland-Palatinate, BW-Baden-Württemberg, BY-Bavaria, SL-Saarland, BEW-Berlin West, BEE-Berlin East, BB-Brandenburg, MV-Mecklenburg-Western Pomerania, SN-Saxony, ST-Saxony-Anhalt, TH-Thuringia

vances in reducing mortality since the 1980s across all federal states were made at older ages, though progress is made at all groups.

Apart from the regularities observed across the federal states where increasing life expectancy goes hand in hand with decreasing life expectancy lost, some interesting deviations exist. This concerns for example the city states of Hamburg and Bremen: both exhibit higher levels of life expectancy lost than could be expected for their levels of life expectancy and will be investigated further in the analysis.

4 Conclusion

Though mortality differences between German regions are small compared to several other countries, there is still space for improvement in some parts of the country.

If the same level of life expectancy should be achieved for all the German federal states, then mortality in those federal states with excess mortality would have to be reduced in particular ways. For males, excess mortality especially around the age of 20 and around 40-50 years of age is a major issue. On the other hand for females, excess mortality at ages above 65 is most relevant.

If an equal death distribution (reducing life expectancy lost) were the main goal, death rates at all ages had to exhibit similarly fast rates of change as the death rates in the old ages do.

References

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