

# **Drastic changes in regional life expectancy disparities in Germany**

July 15 2015

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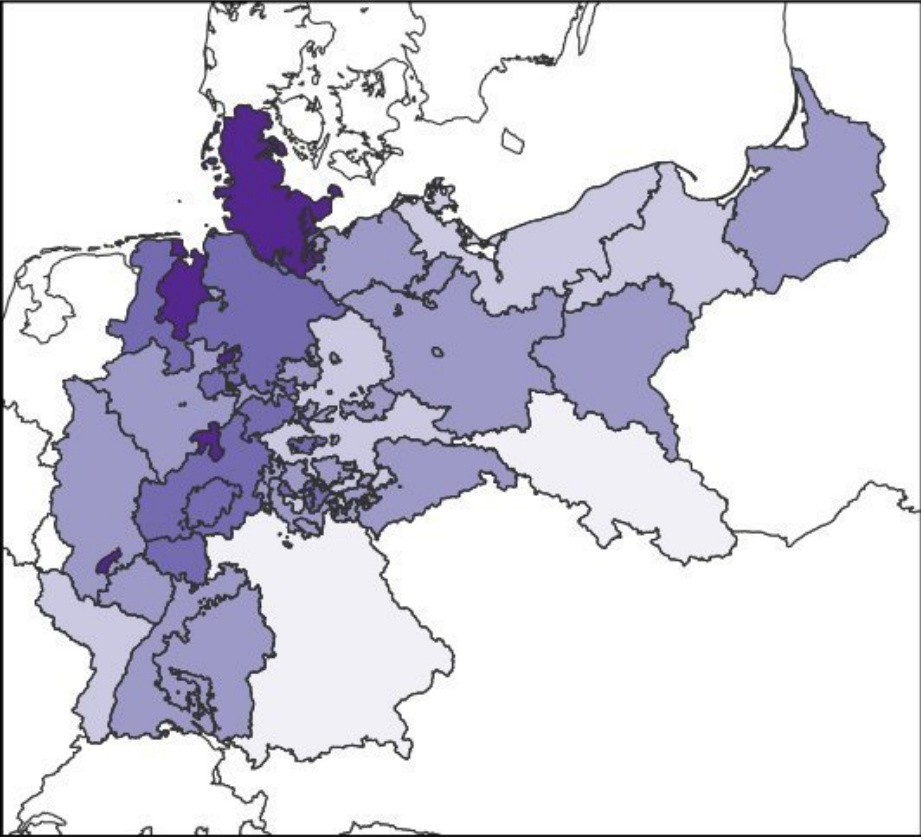
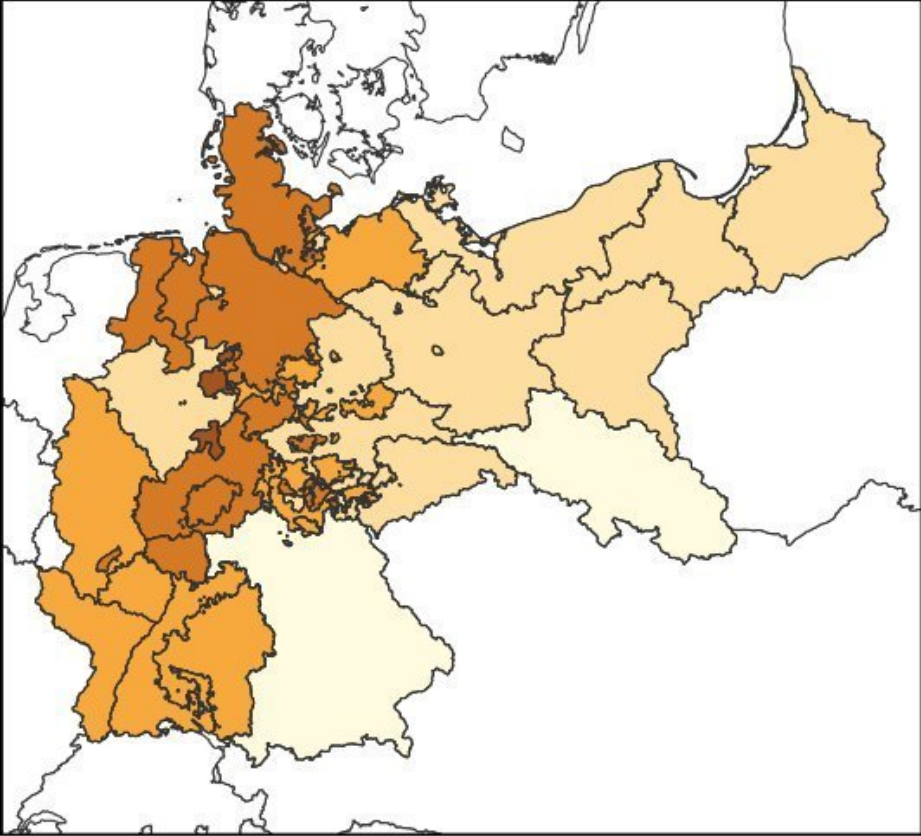


Fig. 1: Regional life expectancy at birth in Germany 1910. Calculated on the basis of averaged mortality data for the period 1908-1913. Source: Statistisches Reichsamt 1918; own calculations. Base map: MPIDR Population History GIS Collection (based on the VG 2,500 Federal Agency for Cartography and Geodesy). Credit: Max Planck Institute for Demographic Development

Over the last 100 years, marked changes have occurred in Germany's regional life expectancy patterns. These include differences between the eastern and western part of the country and substantial shifts in the disparities between northern and southern Germany. By the beginning of the 20th century, the northern regions had the highest life expectancy, while the southern regions had the lowest levels. Today, this pattern is largely reversed. Research projects at the Max Planck Institute for Demographic Research look into the determinants of these mortality trends.

Average life expectancy is an important indicator of societal development and the health of a population. It is influenced by a multitude of factors. These include, for example, the population composition in terms of socio-economic characteristics such as the level of education attained and participation in working and social life. However, populations also differ in relation to the prevalence of behaviours that can have an influence on health. These include, for example, smoking, eating and drinking habits. Moreover, so-called contextual factors such as access to healthcare and the level of environmental pollution to which people are exposed play a role. Research projects at the Max Planck Institute for Demographic Research demonstrate that considerable shifts in the regional life expectancy disparities have occurred in Germany over the course of the last hundred years. These changes are related to, among other things, the

fact that the influence specific factors had or have on regional differences in life expectancy underwent a marked change over the course of time.

In order to derive the [average life expectancy](#) of a population, mortality tables are calculated which take data on the age structure of the population and the recorded deaths by age into account. The "life expectancy" indicates the average number of years that newborns or persons of a particular age would live if the mortality conditions that exist in the period under consideration were to prevail until the end of their lives.

Research on the long-term regional development of social and economic processes in Germany faces the challenge that both its national borders and internal administrative borders have changed considerably over the last hundred years. To be able to take these border changes into account, the Max Planck Institute for Demographic Research developed the MPIDR Population History GIS Collection. This provides geodata on the development of administrative borders over the last hundred to two hundred years for Europe, Germany and several other countries.

## **Continuities and discontinuities in regional life expectancy patterns**

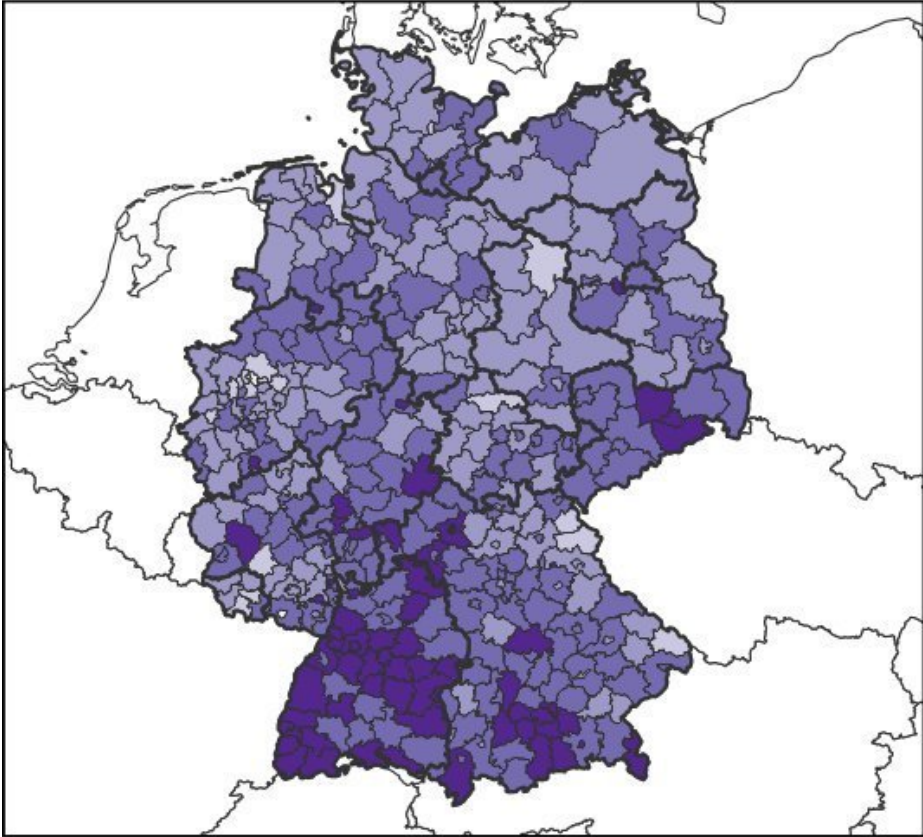
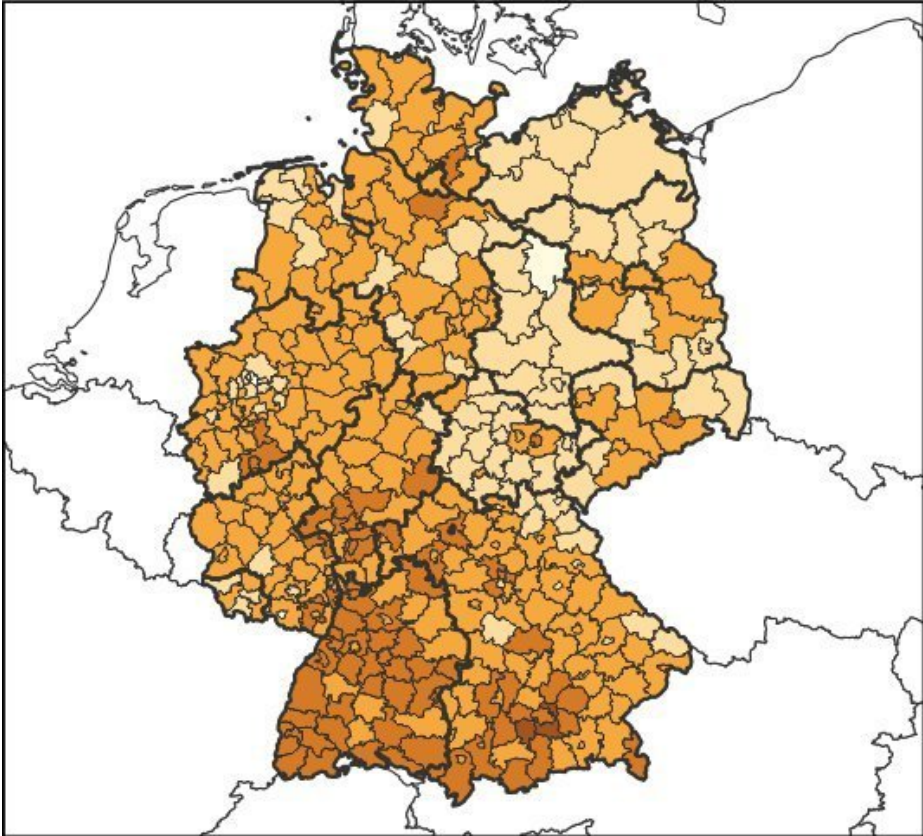


Fig. 2: Regional life expectancy at birth in Germany 2010. Calculated on the basis of averaged mortality data for the period 2009-2011; administrative districts that have undergone an exchange of areas since 1995 have been merged. Source: Statistische Ämter des Bundes und der Länder 2014; own calculations. Base map: MPIDR Population History GIS Collection (based on the VG2500 Federal Agency for Cartography and Geodesy). Credit: Max Planck Institute for Demographic Development

Comprehensive data on life expectancy in individual German regions are available from the early 20th century in geographically detailed form. In a research project at the Max Planck Institute for Demographic Research, regional differences in life expectancy at birth at around 1910 were compared with current data. This makes it possible to demonstrate continuities and discontinuities in the regional patterns. Figure 1 shows the situation around 1910. At that time, the life expectancy of men in the German Empire was 47.4 years with the regional values ranging from 42.8 to 53.8 years. Women had a life expectancy of 50.7 years and the regional data presented a somewhat smaller range of variation of 48.1 to 55.5 years. The regional patterns for men and women were very similar. Regions with high values were mainly concentrated in the north-west of the country and regions in Hesse. The lowest life expectancy was recorded in Bavaria and Silesia.

Figure 2 shows the current regional patterns in life expectancy based on geographically more differentiated data. In terms of long-term continuities, it shows that disparities in regional life expectancy for men remain very high in contrast to those observed for women. Today, men have a life expectancy at birth of 77.7 years with regional values of between 74.6 and 81.3 years. Women have a life expectancy of 82.7 years while regional numbers vary between 79.8 and 84.5 years. Compared to 1910, the areas with the highest life expectancy in 2010 are

no longer concentrated in the north of the country but in the south. This reversal in the development of the north-south disparities emerged around the middle of the 20th century. The change was initially concentrated on life expectancy at birth and in the younger age categories. In contrast, a similar trend in life expectancy at 60 or 80 years was not recorded until later. In the early 21st century the regional patterns for the probability of reaching an extreme age of over 105 years still tended to correspond to the regional life expectancy patterns recorded in 1910.

With regard to the disparities between eastern and western Germany, it can be observed that in both 1910 and 2010, the life expectancy of men in today's eastern Germany tended to lag behind that in directly bordering western areas. In terms of east-west disparities, it is, however, possible to identify periods with different trends over the course of the last hundred years: for example, predominantly converging trends could be observed in the period between 1920 and 1970. From the early 1970s, the differences increased dramatically again as life expectancy improved far more rapidly in the west than in the east. Since the early 1990s, the values in the east – for women at least – have converged almost fully with those in the west. East German men have also made strong progress in catching up with their western counterparts, though they still lag somewhat behind.

## **Possible explanations for the observed developments**

Research findings indicate that the shift from a north-south to a south-north disparity developed in parallel to similar trends in the economic sphere. In the early 20th century, southern Germany was still economically less well developed than the north. One reason for this was that, due to its proximity to international harbours the north was able to benefit from the globalization of markets at an earlier stage than the south. Moreover, most of the industrial areas tended to be rather

concentrated in the north of the country. Over the course of the 20th century, the south of Germany managed to overtake the north. A variety of factors contributed to this development. For example, during the transition from the industrial age to the knowledge age, the south was able to benefit from a long-established high density of institutions of higher education there.

Overall, it may be observed that the correlation between the economic development of a region and the recorded life expectancy trends has intensified over the last hundred years. This is connected to, among other things, the fact that in the past economically well-developed areas such as cities and industrial regions were characterized by high levels of environmental pollution and unfavourable sanitary conditions. Most of these problems were overcome through technological progress. The fact that cultural traditions are less influential today also contributes to a closer correlation between economic development and life expectancy. For example, the low life expectancy in Bavaria around 1910 was closely linked with the cultural pattern that many Bavarian mothers did not breastfeed their babies but fed them with flour and water porridge. Because the water they used was frequently contaminated with pathogens, many infants died of diarrhoeal diseases. Hence, in parts of Bavaria, one out of four children did not reach their first birthday, while the corresponding figure for north Germany was just one in ten infants. Nevertheless, regional cultural differences in eating and drinking habits, for example, can still be somewhat relevant today in explaining the regional differences in life expectancy.

The development of the major east-west differences in the post-1970 period is related to the considerable improvements in healthcare in West Germany. These enabled the considerable reduction of mortality from, among other things, cardiovascular diseases in recent decades. East Germany initially lagged behind in this process, as the German Democratic Republic was not in a position to develop its healthcare



system to the same extent. From 1990, healthcare in the east was adapted to the level of that in the west, a development that also contributed to the reduction of the east-west disparities in life expectancy.

The future development of the regional differences in [life expectancy](#) in Germany will enable the assessment of whether the drastic change observed in the 20th century was an unusual process. To be able to examine the regional trends in greater detail, the Max Planck Institute for Demographic Research is currently working on a regional version of the Human Mortality Database for Germany. This regional database will also enable the comparison of trends in individual Federal States with developments in neighbouring countries.

**More information:** "Regional mortality disparities in Germany. Long-term dynamics and possible determinants." *Kölner Zeitschrift für Soziologie und Sozialpsychologie* 67 (2015, in print)

"MPIDR Population History GIS Collection" Max Planck Institute for Demographic Research, Rostock (2015). [www.censusmosaic.org/](http://www.censusmosaic.org/)

"Spatial inequalities in infant survival at an early stage of the longevity revolution. A pan-European view across 5000+ regions and localities in 1910." *Demographic Research* 30 (68), 1849–1864 (2014).  
[dx.doi.org/10.4054/DemRes.2014.30.68](https://doi.org/10.4054/DemRes.2014.30.68)

Human Mortality Database (HMD): [www.mortality.org/](http://www.mortality.org/)

Provided by Max Planck Society

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