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Have life expectancies in eastern and western Germany converged since reunification?

Version française

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Following the division of the country in 1949, life expectancy in East and West Germany diverged. Markéta Pechholdová and her colleagues compare trends in mortality by cause in the two parts of Germany to explain the factors behind this divergence and the new trends observed since reunification.

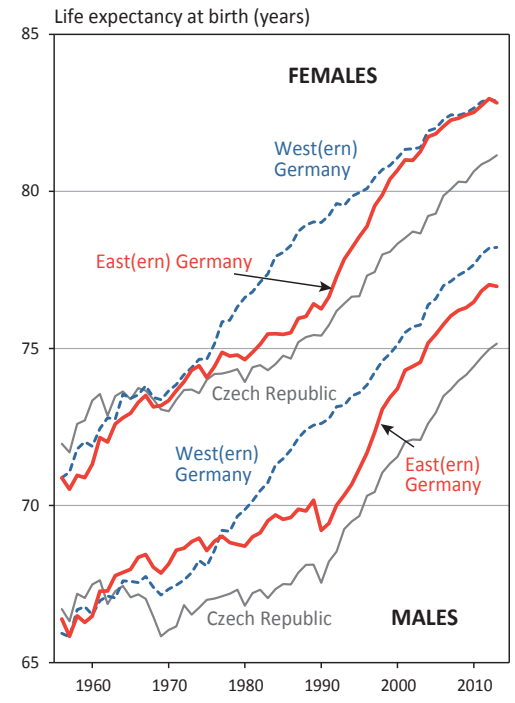
From 1949 to 1989, Germany was divided into two separate states. Despite faster economic development in West Germany than East Germany, life expectancies did not begin to diverge until the mid-1970s. In 1990, the year of reunification, the life expectancy gap was at its widest, with a difference of 3.4 years for men and 2.8 years for women (Figure 1). A period of convergence then began, and by 2004, women in eastern Germany had already caught up with their western counterparts. In 2013, the gap was just 1.3 years for men and had practically disappeared for women (0.17 years).

It is interesting to compare eastern Germany with its neighbour, the Czech Republic, which also experienced a period of Communist rule that later collapsed. Czech women, who were close on the heels of East German women in 1989-1990, managed to narrow the gap slightly with western Germany in the 1990s, but have made no further headway over the last ten years. Clearly, German reunification has had a positive effect over and above that brought about by the downfall of the Communist regimes in central Europe. The pattern is similar for men, although eastern German men have struggled to catch up fully with their western counterparts in recent years.

A "natural" experiment

The partitioning of Germany and its subsequent reunification can be seen as a natural experiment,

Figure 1. Life expectancy at birth in the two Germanies and in the Czech Republic



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Source : Human Mortality Database

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offering a unique opportunity to measure the effects of two different policies imposed upon a single temporarily separated population, and vice versa. In the abundant literature on this topic [1-4], it is generally assumed that the widening of the life expectancy gap in the 1970s and 1980s is attributable to a decline in health care and living standards over that period, and that the closing of this gap since 1991 can be explained by their subsequent improvement. Differences in lifestyle and health behaviours are also believed to have played a role, but probably less so in the phase of convergence than in that of divergence. An analysis of trends in causes of death throughout this period sheds new light on the way these processes played out.

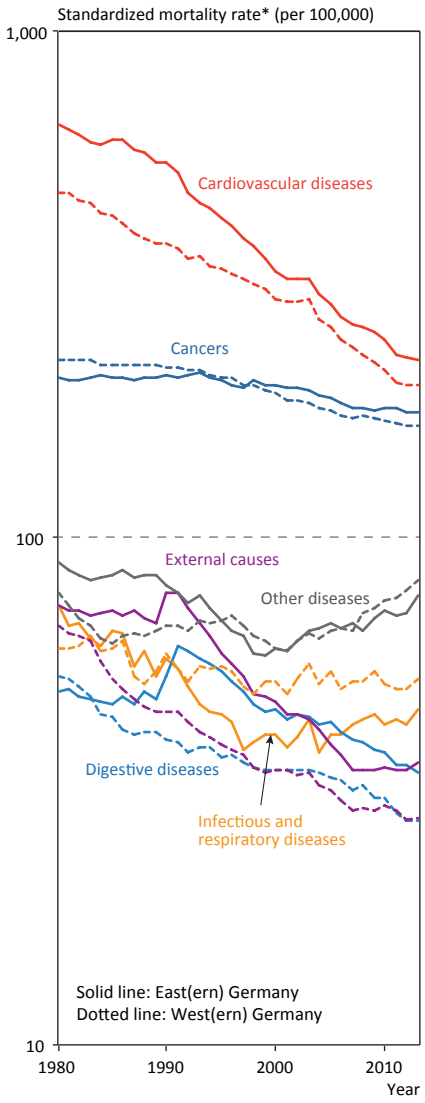
Reunification: no trend reversal, but a changing tempo differential

It is difficult to track medical causes of death because the classifications of diseases are regularly updated and coding practices differ over time and space [5] (see Box). Thanks to the initial findings of a long-term project to reconstruct time series of deaths by cause with constant definitions for both eastern and western Germany [6], we are now able to analyse mortality by cause in the two Germanies since 1980. In that year, the East-West life expectancy gap was already one and two years for males and females, respectively, but it widened considerably up to 1990. This means that most of the past divergence process can be compared with the current pattern of convergence.

Figure 2 shows mortality trends by major groups of causes. In 1980, in both East and West Germany, cardiovascular diseases were by far the largest killers, well ahead of cancers which, in turn, caused more deaths than any other groups of causes. While cardiovascular mortality was already starting to decrease in both Germanies at that time, it was a powerful factor of life expectancy divergence, simply because its decline in the East was slower than in the West. The slight contrast between a small rise in cancers in the East and their stabilization in the West also contributed to divergence, though to a lesser extent.(1) The trends in other groups of causes, while important from an epidemiological viewpoint, had only a marginal impact on trends in life expectancy. The health policy of the Communist regime was not without its positive effects, however. Its main weakness was its inability to reduce cardiovascular mortality as rapidly as in West Germany, and, even more importantly, to stem the rise in digestive diseases (cirrhosis of the liver in particular) and in deaths from external causes (accidents and violence).

No group of examined causes exhibits a clear trend reversal resulting from German reunification. However – and this is the main factor behind the convergence – cardiovascular mortality in eastern Germany began to fall faster than in the west after 1990, thus reversing the previous pattern of decline. For male cancers, the change was in the opposite direction, producing a slight slowdown in the pace of convergence. Last, we observe a sudden, albeit temporary, increase in deaths from external causes and digestive diseases linked to the abrupt regime change, which also slightly delayed the convergence process.

Figure 2. Trends in causes of death in the two Germanies since 1980



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* annual deaths per 100,000 population, constant age distribution, log scale.

Source: Human Mortality Database.

A faster decrease in cardiovascular mortality

Figure 3 shows the trends in mortality from myocardial infarction, chronic ischaemic diseases of the heart, cerebrovascular diseases and other circulatory diseases. In 1980, mortality from myocardial infarction was no higher in East than in West Germany, but its decline was particularly slow and irregular in the East until the early

(1) The impression given by Figure 2 with regard to cancers should be interpreted with caution. Cancer mortality in East Germany may have been underestimated (Box) and the crossing of the east-west curves in the early 1990s may thus be a partial artefact.

Figure 3. Trends in circulatory diseases in the two Germanies since 1980

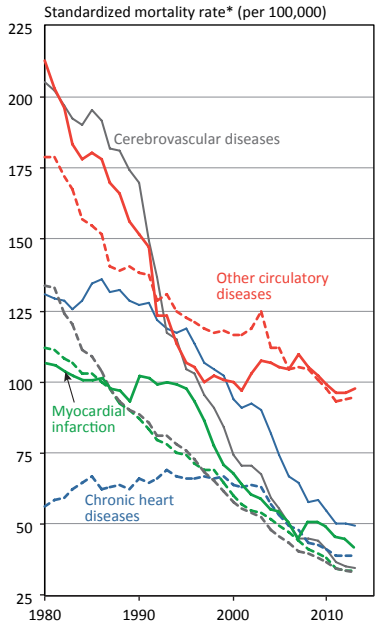
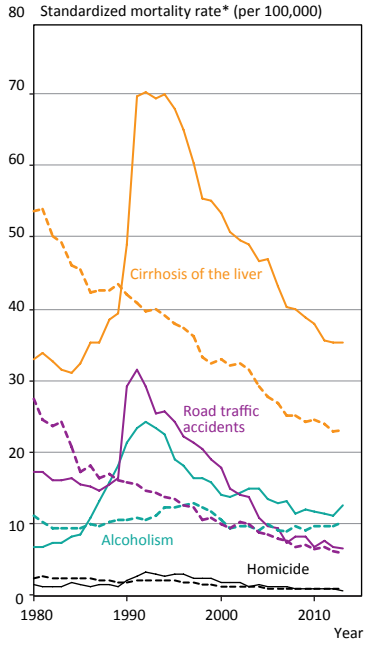


Figure 4. Trends in mortality due to alcohol, accidents and violence in the two Germanies since 1980



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Solid line: East(ern) Germany; dotted line: West(ern) Germany

* annual deaths per 100,000 population, constant age distribution.

Source: [6]

1990s, in contrast with the rapid and steady decrease observed in the West. These distinct trends in this group of causes contributed quite strongly to the East-West divergence. Concerning chronic ischaemic heart diseases, on the other hand, mortality in East Germany was much higher in 1980. However, unlike myocardial infarction, these diseases had little impact on divergence as the patterns in East and West Germany were very similar before reunification. There has been substantial convergence since then, although this may partly reflect the recent harmonization of coding practices (Communist countries massively over-reported atherosclerotic heart diseases), the consequences of past differences being difficult to expunge completely (see Box). Last, by far the main factor of divergence followed by convergence is the contrast in patterns of cerebrovascular disease, with a slower decrease in East Germany until 1990, a subsequent acceleration of progress and a spectacular catch-up in the 1990s. Given the rapid pace of improvement, the initial reduction in excess eastern German cardiovascular mortality is probably attributable to the development of modern treatments (non-invasive cardiac surgery, effective drugs, emergency medical teams) rather than to changes in behaviour, whose effects emerge more slowly. This hypothesis has yet to be verified, although it has already been confirmed for the Czech Republic [7].

The shock of reunification as reflected in violent deaths and digestive diseases

The sudden drop in eastern German life expectancy in 1990, clearly visible on Figure 1, is only mirrored on two curves in Figure 2, those of external causes and of digestive diseases. Figure 4 shows the three specific causes that contribute most to this drop: cirrhosis of the liver, alcoholism and road traffic accidents. This shock was very violent. The collapse of Communism disrupted the rules of social life, giving leash to high-risk behaviours (alcoholism, reckless driving, etc.) that were compounded by the stress of transition to a market economy. Note that the peak of this sudden mortality surge varies considerably across the different causes of death. Road traffic mortality increased almost immediately, while deaths from cirrhosis of the liver and alcoholism did not reach their maximum until a few years later; fatal accidents increased as soon as cars became more numerous, while the effects of heavy drinking were less immediate. In any case, these data confirm and explain the mortality changes associated with the "demographic shock" often mentioned in the literature, which concerned fertility and marriage likewise [8]. While the overall impact of these changes was small compared with that of cardiovascular diseases, they nonetheless held back the convergence process; above all, they were largely responsible for the abrupt widening of the east-west gap in 1990-1991, making the subsequent convergence, once the initial shock was over, even more spectacular.

A certain difference persists

Compared with other post-Communist countries of central Europe, eastern Germany has made spectacular progress in reducing mortality thanks to reunification.

Cause-of-death statistics

The data on causes of death were provided by the German Statistical Office. However, comparing trends in mortality by cause of death in the two parts of Germany poses numerous methodological problems. First, the time series of deaths by cause are disrupted by the transition in 1998 from the 9th to the 10th revision of the International Classification of Diseases (ICD). To reconstruct series with a constant definition, we applied the method developed in France [5] to an abridged list of 186 categories of causes [9]. In addition, during the Communist era, certain causes of death (primarily digestive diseases and deaths from external causes) were politically sensitive, and therefore excluded from official statistics. By good fortune, these statistics were found in the secret tables held in the archives. It was more difficult to deal with the differences in coding practices between East and West Germany. For example, when eastern Germany switched to the western coding system in 1990-1991, cancer mortality suddenly increased by 10%, and major changes were observed in diseases of the circulatory system, such as non-specific atherosclerosis or essential hypertension. All these trend breaks had to be identified and corrected.

The adjusted data will be soon available online in the Human Cause of Death Database (www.causesofdeath.org).

The process is not entirely complete, however. In terms of life expectancy, while women in eastern and western Germany have reached the same level, eastern men still lag behind their western counterparts and the causes of death differ slightly for both sexes. Deaths from accidents and heart disease are still more frequent in the east, for men and women alike. However, among eastern women, this disadvantage is more than offset by lower mortality from other causes. For eastern men, on the other hand, death from cancers (especially lung cancer) and digestive diseases (mainly cirrhosis of the liver) are higher than in the west, and are not offset by any significant advantage in terms of lower mortality from other causes. Eastern men are still exhibiting the negative after-effects of the previous regime in terms of cardiovascular and man-made diseases (alcohol and tobacco consumption, accidents and violence, and risk behaviours for heart disease). Thanks to improvements in the health system resulting from reunification, the eastern part of Germany is catching up with the west. However, lifestyles and individual behaviours in the two parts of the country are still very different [6].

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Abstract

After diverging when Germany was divided into two separate states, life expectancies in the two parts of the country have converged since reunification. While eastern men have not fully caught up with their western counterparts, eastern Germany is closing the life expectancy gap thanks to improvements in the health system and changes in individual behaviours.

Keywords

Germany, east-west contrast, life expectancy, causes of death.

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