

Low migrant mortality in Germany for men aged 65 and older: fact or artifact?

Eva Kibele · Rembrandt Scholz ·
Vladimir M. Shkolnikov

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Abstract Migrant mortality in Europe was found to be lower than mortality of host populations. In Germany, residents with migrant background constitute nearly one tenth of the population aged 65+ with about 40% of them being foreigners. The German Pension Scheme follows vital status of pensioners very accurately. Mortality re-estimation reveals two-fold underestimation of mortality of foreigners due to biased death numerator and population denominator.

Keywords Migrants · Mortality · Germany · Vital statistics registration · Pensions

Introduction

Migrant mortality has attracted substantial research interest. First, it provides the opportunity to look at the combined influence of earlier life conditions in the country of origin and the more recent life conditions in the receiving country. Second, it allows one to see how cultural and behavioral patterns imported from the country of origin and their further transformation affect migrant health. Third, it enables the researcher to gain insight into selective migration of healthy people (the healthy migrant effect). Indeed, at the very moment of moving, most migrants are in good health because immigration and assimilation to the foreign society are hardly compatible with serious health

problems. In addition, migrants often have to pass obligatory medical examinations before they immigrate.

In Germany and other European countries, migrant mortality was found to be much lower than the mortality of the host population [1–6]. Prior studies have tended to consider the healthy migrant effect as a central explanation of very low immigrant mortality. In addition, the possible role played by behavioral and psychological factors has been emphasized [1, 2, 7].

At the same time, there has also been serious concern about the reliability of demographic data on the mortality of migrants. The main problem is related to migrant moves between the home and host country. If departures from the host country and deaths in the country of origin are under-recorded, the moves produce a numerator-denominator bias leading to the under-estimation of migrant mortality. Deaths of migrants in the country of origin unregistered by the population statistics in the receiving countries cause “statistical immortality.” The results of under-registered return migrations and deaths abroad may be particularly problematic at advanced ages (90+), i.e., at ages when the share of “immortals” cumulated over time can become significant compared to the relatively small remaining population [4, 8, 9]. Biases in the data can be substantial even when micro-data from population registers or cohort follow-up studies are used [3, 10]. This is so because a segment of migrants (the less-well-integrated and less healthy) may tend to be at higher risk of observation censoring due to departure [3].

In Germany in 2005, 15.3 million people (or 18.6% of the total population) had a migrant background¹ and 7.3 million

E. Kibele (✉) · V. M. Shkolnikov
Max Planck Institute for Demographic Research,
Konrad-Zuse-Str. 1, 18057 Rostock, Germany
e-mail: kibele@demogr.mpg.de

R. Scholz
Rostock Center for the Study of Demographic Change,
Rostock, Germany

¹ German residents, who themselves have immigrated or were born as foreigners in Germany or who are residents with at least one parent who has either immigrated or was born in Germany as a foreigner [11].

(8.9%) had foreign citizenship [11]. Among the population aged 65+, 7.6% had a migrant background (mostly first-generation immigrants) and 3.4% of them were foreigners [11, 12]. Many labor migrants (*Gastarbeiter*) arrived in Germany in the 1950 and 1970s, at a time when the rapidly growing German economy experienced a labor shortage. They came mainly from Southern Europe and took up jobs in the coal, iron, steel, and automobile industries of Germany. Many of them have been granted permanent residence in Germany but not German citizenship. The so-called *Aussiedler*, i.e., ethnic Germans, mostly coming from the former Soviet Union, were the exception. They were granted the legal right to receive German citizenship upon arrival [13]. On average, foreigners have higher unemployment rates than Germans, their educational level is lower, and they have jobs that require relatively low qualifications [14, 15].

German population statistics are not free of problems, possibly resulting in an overestimation of the foreign population (see also [4]). The last West German and East German censuses took place in the 1980s. Since then, the population has been updated on the basis of vital event registration. Foreigners are also registered by the Central Registry of Aliens (*Ausländerzentralregister*), but a recent update of this source has not been translated into German population statistics [14]. Departures from Germany to stay abroad for long periods legally should be notified. Nevertheless, allegedly many fail to do so since an eventual return to Germany is facilitated by maintaining a German address.

In studies of migrant mortality, data problems are usually not addressed by direct checks since it is difficult to find high-quality data sources alternative to the official population statistics. We are aware of only one study that re-estimated migrant mortality. This was done for Sweden on the basis of income and taxation data [10]. The authors calculated death rates for foreign migrants aged 20–64 who had some registered income (either earnings or social benefits) and excluded those who had no registered income. The latter category was considered as the one that included a high proportion of people who (*de facto*) resided abroad. After the exclusion, the immigrant death rates substantially increased compared to the initial rates calculated from the whole migrant population. Correspondingly, the migrants' mortality advantage diminished and became statistically insignificant in most immigrant groups.

Our study is based on data of the scientific use files of the Federal German Statutory Pension Scheme (DRV *Bund-Deutsche Rentenversicherung Bund*) for the re-estimation of the mortality of the retired German and foreign populations. These data were provided by the DRV Research Data Centre in Würzburg [16]. The data cover all public old-age pensions resulting from work careers in Germany and all of the three former branches of the pension insurance: workers, salaried employees, and miners.

The data also reflect pension terminations due to the death of pensioners. We consider only men because many women who are now retired have never participated in the labor market. The DRV data cover about 90% of the German male population aged 65+. The remaining people are those whose working careers were entirely related to self-employment or to the German Civil Service.

The DRV data allow to identify the narrowly defined migrant population, i.e. pensioners with foreign citizenship. In 1995–2004, about 190,000 (or 3.5%) of the 5.4 million male pensioners aged 65+ had foreign citizenship. The DRV information about pensioners' nationality is considered to be exact [17]. The DRV data on the insureds' vital status are also highly reliable. As the function of pension insurers is to provide pension payments, they follow the survival of pensioners very carefully, using several sources: information from the pay-out service of the German Post (*Postrentendienst*), which receives death notices from the registrar's office or from the undertaker; information provided by surviving dependents; or information about pensions not delivered. Those receivers of German pensions who live abroad must provide annual confirmation of being alive. Nevertheless, we excluded pensioners with current residence abroad in order to achieve greater data homogeneity.

The official population figures, population and deaths by 5-year age groups, split by German and non-German nationality, were obtained from the Federal Statistical Office [12].

On the basis of the DRV and official population data, we computed two sets of deaths and population exposures at ages 65–69, 70–74, ..., 90+ for the years 1995, 1998, 2001, and 2004. To estimate life expectancies at age 65, abridged life tables were constructed using Chiang's method [18, 19].

Table 1 presents population figures and deaths from official population statistics and DRV pension data. For German men, the death and population ratios of population statistics to DRV statistics are the same. Both official population and official death figures exceed the figures provided by DRV by 9% over the whole period, indicating that DRV data cover 91% of the German population. For foreigners, however, there is a pronounced disagreement between population and death figures. The national figure for the former exceeds the DRV figure by 33%. For the latter, by contrast, the national figure is lower by 33% than that given by the DRV. This gap suggests a major bias in population statistics on foreigners, induced by an overstated population and under-stated deaths. Table 1 suggests that mortality of foreigners in the official statistics is about two-fold higher than its true value based on the DRV data.

Age-specific death rates (displayed in Fig. 1) accordingly show good agreement for Germans between the official population statistics and the pension statistics except for very old ages, i.e. 90+ at which the official

Table 1 Comparison of male population and death counts (age 65+) between German official population statistics and DRV data for the years 1995–2004

Nationality and year	Population			Deaths		
	In thousands		Ratio Population statistics/ DRV statistics	In thousands		Ratio Population statistics/ DRV statistics
	Population statistics	DRV statistics		Population statistics	DRV statistics	
Germans						
1995	4408.0	4023.1	1.10	277.7	255.1	1.09
1998	4704.2	4311.3	1.09	270.7	252.4	1.07
2001	5208.7	4760.2	1.09	268.5	232.5	1.15
2004	5879.4	5356.6	1.10	277.1	264.1	1.09
1995–2004	20,200.2	18,451.3	1.09	1,093.9	1,004.1	1.09
Foreigners						
1995	109.7	76.7	1.43	2.7	3.7	0.74
1998	144.7	104.2	1.39	3.3	4.6	0.71
2001	190.0	144.2	1.32	4.0	5.5	0.73
2004	251.0	197.3	1.27	4.9	8.4	0.58
1995–2004	695.3	522.3	1.33	14.9	22.1	0.67

Calculated from: official population statistics from the German Federal Statistical Office [14]; pension statistics from scientific use file SUFRBTBNTWF94-04TDemoKibebe [5]

population statistics understate the male mortality [8]. For foreigners, there is a very large disagreement in age-specific death rates. Official population statistics on the death rates for foreigners are extremely low at all ages and do not show the expected increase over age. The corresponding figures of DRV data are similar to those for Germans.

Table 2 shows nearly the same life expectancy figures for Germans at age 65 in both data sources (15.3 years in the population statistics and 15.6 years in the DRV statistics for the whole observation period). For foreigners, the population statistics' figures are unrealistically high (e.g. 30.2 years)

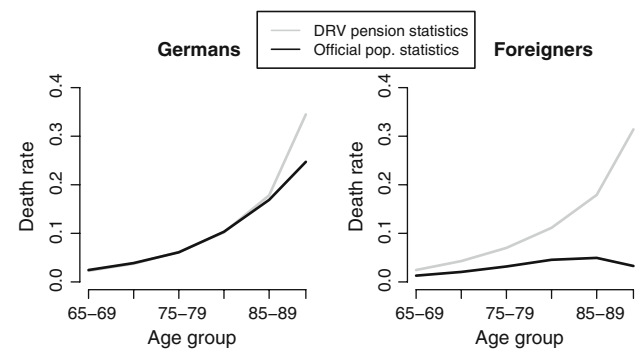


Fig. 1 Comparison of death rates between German official population statistics and DRV data: pooled data for the years 1995, 1998, 2001, and 2004. Calculated from: official population statistics from the German Federal Statistical Office [14]; pension statistics from scientific use file SUFRBTBNTWF94-04TDemoKibebe [5]

and very different from the figures provided by the DRV data (15.0 years). Importantly, German life expectancy in the DRV data is slightly higher than that of foreigners. Finally, both in the population statistics and the DRV data, overall life expectancy based on pooled data on Germans and foreigners hardly deviates from the life expectancy of Germans because the impact of the foreign population figure is small.

The life expectancy figures of the order of 30 years at age 65 calculated from German official population statistics are obviously implausible. They are much higher than the levels of longevity experienced by Japanese women (23.2 years in 2005), the world's lowest mortality population. The bias is produced by the inflated population denominator and the under-stated death numerator in German population statistics. By contrast, DRV data (which is based on the rigorous follow-up of people eligible to receive German old-age pensions) show that the mortality of foreigners aged 65+ is actually slightly higher than the mortality of German men. At least among men aged 65+ the seemingly large mortality advantage of foreigners compared to Germans is a statistical artifact.

Our study makes clear that the inaccuracies in estimation of the population denominator and the death numerator can result in serious underestimation of immigrant mortality. However, a significant mortality advantage of immigrants could be found even in studies where the researchers were well aware of the possible bias [5]. Even in the Swedish

Table 2 Life expectancy at age 65 for men in Germany, for the years 1995, 1998, 2001, and 2004, in years

Year	Germans		Foreigners		Germans and foreigners	
	Population statistics	DRV statistics	Population statistics	DRV statistics	Population statistics	DRV statistics
1995	14.7	14.6	25.9	14.3	14.7	14.6
1998	15.2	15.2	29.2	14.8	15.4	15.2
2001	16.0	16.4	34.1	15.7	16.2	16.4
2004	16.6	16.2	37.8	15.0	16.8	16.1
1995–2004	15.3	15.6	30.2	15.0	15.4	15.6

Calculated from: official population statistics from the German Federal Statistical Office [14]; pension statistics from scientific use file SUF-RTBNRTWF94-04TDemoKibele [5]

study mentioned earlier that revealed a general underestimation of mortality among immigrants, a statistically significant mortality advantage could be observed in some immigrant groups, i.e., women from Southern Europe, men from Latin America, Africa and Asia [10].

The underestimated mortality of foreigners should result in the underestimation of mortality in the broader group of German residents who have a migrant background. As mentioned earlier, foreigners constitute about 40% of all people with migrant background at ages 65+. Assuming for simplicity the same level of true mortality among all German residents with migrant background and precisely reported mortality of German nationals with migrant background, it is easy to see that the two-fold underestimation of mortality of foreigners leads to a 25% underestimation of mortality of all residents with migrant background.

How can the mortality advantage of the migrant population found elsewhere [1, 2, 4, 5] be reconciled with the complete absence of such an advantage in our analysis? The answer may be found by considering the peculiarities of our data compared to the previous studies. First, our study considers “foreigners” or pensioners with current foreign citizenship. Mostly, these are people from Southern Europe who entered Germany in the 1950–1970s and to a much lesser extent more recent immigrants from the former Soviet Union and Eastern Europe. Second, our study includes only people aged 65 and over, while the other studies looked mostly or exclusively at people of working age. Close to the age of their migration, the health advantage of immigrants can be attributed to the selection effect of healthy people, to healthier behaviors and dietary habits, and to positive psychological expectations [1, 2, 7].

For many reasons, the initial advantage does not translate into a mortality advantage at ages of 65 and over. Certain factors affecting immigrants in the country of their new residence can lead to a steeper (compared to the host population) health decline with age. In particular, immigrants may gradually adopt less healthy “western” lifestyles associated with higher coronary risk. In old age they may also experience higher mortality from conditions

related to childhood infections and deprivation, such as stroke and stomach cancer [7, 20, 21].

Most importantly, immigrants face the health consequences of lower socioeconomic status such as poorer life conditions, restricted life chances, and corresponding psychological stress [22]. According to DRV data, 86% of foreigners but only 45% of Germans belong to the lower 40% of the lifetime income distribution. Our earlier analysis shows that this category of pensioners experience approximately 50% mortality elevation compared to those belonging to the upper lifetime earnings’ quintile [23]. Foreigners are also characterized by a higher share of former manual workers: 80% vs. 58% among Germans. This status is associated with a 35% mortality excess compared to the white-collar occupations [23].

Speculation about potential reasons for a steeper health decline with age among the immigrants is supported by empirical evidence that confirms that the initial health advantage of foreigners “wears off” over time [3, 24, 25]. This pattern can lead to mortality convergence and even mortality crossover between the host and migrant populations.

In general, our results support the concern about the reliability of very low estimates of migrant mortality at ages 65 and over. It is possible that, despite the initial health advantage, the slightly higher mortality of foreigners in the 65+ population is a result of socioeconomic health inequalities. This is a serious public health concern that deserves further investigation.

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