1.4 Fertility and Mortality Data for Germany

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Abstract

There has been considerable progress made in the improvement of the data infrastructure for fertility and morality researchers in Germany in recent years. Several large-scale datasets have been made available through the establishment of Research Data Centers. The Microcensuses of the 1970s and 1980s, the censuses of the German Democratic Republic and the Federal Republic of Germany, the Microcensus panel, data from the pension registers, individual-level data from vital statistics, and the central foreigner registers are now available for scientific use. Vital statistics have been reformed, and the Microcensus now collects information on the number of children a woman has given birth to during her life. Despite these improvements, there are still some "weak spots" in Germany's data infrastructure. Germany is lacking official counts of reconstituted families. We know little about the mortality risks of immigrants. In addition, the data infrastructure for studying socio-economic differences in mortality risks could be improved, enabling Germany to catch up with international developments in this area. This paper concludes by making some suggestions for improving the available data.

Keywords: fertility, mortality, demographic data

1. Introduction

Since the turn of the last century, demographic change has been a popular topic among journalists and policy-makers alike. Yet despite the considerable level of public interest in this topic, the available data was rather poor in Germany: important fertility indicators were lacking, official mortality rates for the "oldest old" were of poor quality, and population counts were inaccurate. Today, however, we can state that the data situation for researchers interested in the field of demographic change has improved tremendously. Germany is about to conduct a register-based census which is expected to give an accurate account of the population size in Germany. Furthermore, new micro-level datasets have become available for scientific use that will enhance our understanding of demographic processes.

This paper provides an overview of what we believe are the most important recent innovations in the field of fertility and mortality research. Obviously, such an overview is subjective and can not be considered comprehensive. Nevertheless, we believe that we have included the most significant and critical datasets in this brief overview. Part 2 presents data and discusses applications. In Part 3 we discuss what could be done to improve data availability in the future. Part 4 concludes the overview, and provides a list of recommendations for the future.

2. Recent progress in the data infrastructure

2.1 Fertility and family research

In the field of family and fertility research, an important step forward was made recently with the amendment of the German Population Statistics Law (*Bevölkerungsstatistik-Gesetz*), which prescribes which data are to be collected for population statistics. For centuries, German vital statistics did not collect births by biological order. Since 2008, German vital statistics includes this type of information (Deutscher Bundestag 2007). Another important amendment provides that the Microcensus will ask female respondents to give the number of their biological children.[1]

Age at first birth and childlessness

The groundbreaking changes in the law will enable researchers to generate important structural fertility indicators, such as the mean age at first birth. The postponement of first birth is one of the most important changes in fertility behavior of the recent years (Sobotka 2004; Billari et al. 2006). Germany has been a forerunner in this development, but official indicators documenting this process were lacking. Due to the amendment of the German Population Statistics Law, it is now possible to generate a (period) mean age at first birth. This indicator is of great public interest. Furthermore, it is a measure that will enter international demographic statistics.

In addition to changes in the age at first birth, the level of childlessness is an indicator that is in great demand and frequently discussed (Berth 2005; Mönch 2007; Schwentker 2007). However, the ultimate level of childlessness cannot yet be calculated based on German vital statistics.[2] This gap in vital statistics can be filled through other sources, however. The *Frauenbefragung Geburten* has been an important source of indicators of permanent childlessness (Pötzsch 2007). In the future, the Microcensus will provide this information, too.

1 The plan is to collect this information every four years. The Microcensus 2008 is the first to include a question on whether the respondent has ever given birth to a child and another one on the total number of children ever born. The question will be asked of female respondents aged 15 to 75.

2 Since 2008, German vital statistics provide birth order-specific fertility information, which is needed to calculate indicators of childlessness. However, birth order specific fertility information for the entire reproductive life of a cohort must be collected first before an ultimate level of childlessness can be generated. The cohort 1993 will be the first one for which birth order information will be available for their entire reproductive lives. This cohort reaches the end of their fertile years in 2038.

Fertility of migrants

From 2008 onwards, the Microcensus will enable researchers to generate fertility indicators according to the socio-economic characteristics of the respondents. This will also enable us to generate the total number of children by nationality and migration background. In addition to the Microcensus, the Turkish sample of the Generations and Gender Survey (GGS) will complement our understanding of the demographic behavior of non-citizens and migrants. The fertility of migrants is an aspect worth pointing out, not only because this topic is of great scientific interest (see Nauck 2007; Milewski 2007), but also because vital statistics are not very useful for understanding the fertility dynamics of non-citizens and migrants. This is partly because population counts of non-German citizens have been imprecise. But this also relates to the fact that it is difficult to generate fertility indicators for a highly mobile population with aggregate level data.

Panel studies in the field of family and fertility

In the past, the Socio-Economic Panel (SOEP, *Sozio-oekonomisches Panel*) has been the major panel study for family and fertility researchers. Although this data provides a rich battery of socio-economic variables, it does not provide much information on the quality of partnership or the intention to become parent. This has limited our opportunities to study, for example, how fertility intentions transfer into behavior. Germany now provides two important datasets – the GGS and the Panel Analysis of Intimate Relationships and Family Dynamics (pairfam) – that will help shed light on the decision-making processes that underlie fertility and nuptiality behaviors. The first wave of the GGS has been released (Ruckdeschel et al. 2006). Data from the second round of the GGS, as well as data of the pairfam, were collected in autumn 2008 (Feldhaus and Huinink 2008).

Fertility and large-scale datasets

For demographic studies, having access to large-scale data is indispensable. In this context, the great achievement of the Research Data Centers must be acknowledged. The Research Data Centers of the Federal Statistical Office and the Statistical Offices of the German *Länder* have made available individual-level data for births and marriages. Additionally, the Microcensuses of the 1970s and 1980s and the censuses of the German Democratic Republic and the Federal Republic of Germany have been made available for scientific purposes. The Scientific Use File of the Microcensus, which opens up new potential for fertility and family analysis, is also now accessible (Schmidtke et al. 2008). Finally, the Research Data Center of the German

Pension Insurance (RV, *Deutsche Rentenversicherung*) provides researchers access to Scientific Use Files of pension records, which can also be used for fertility and family research (in particular, the *Versicherungskontenstichprobe*) (Kreyenfeld and Mika 2008). Fertility analyses with register data, like those that have previously been undertaken mainly for Scandinavian countries, can now be replicated using German data.

2.2 Aging and mortality

It is as crucial in the field of mortality and aging to have access to large-scale datasets as it is for demographic studies. After all, death is quite a rare event. Therefore, large datasets are needed in the calculation of robust mortality estimates. Fortunately, there has been considerable progress made in recent years in terms of the availability of large-scale datasets. New computer techniques and opportunities offered by installed process data sources enable researchers to conduct mortality analyses on large-scale datasets.

Human Mortality Database, population size and census

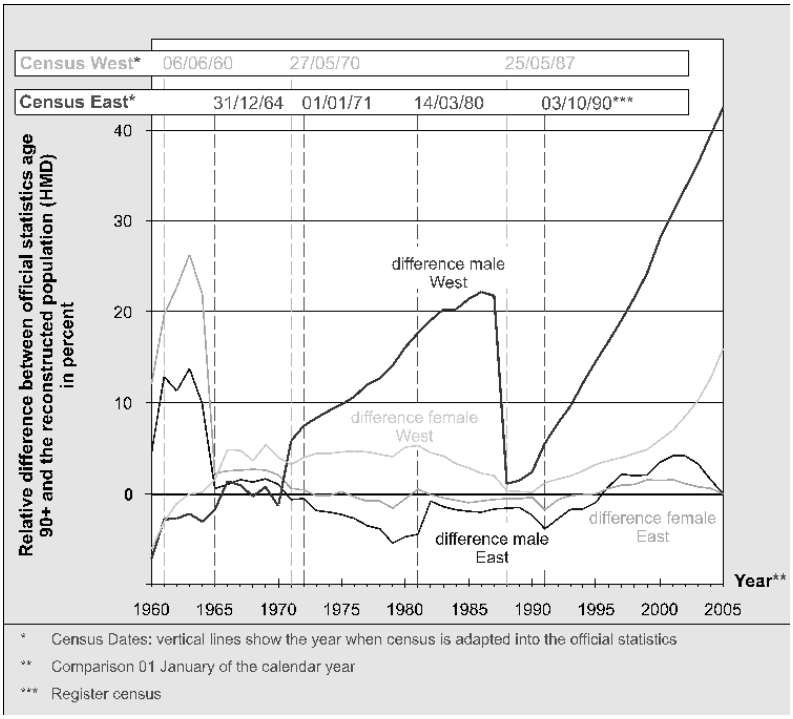
The Human Mortality Database (HMD) is a collaborative project which has been conducted since 2002 by the University of California at Berkeley (US) and the Max Planck Institute for Demographic Research (Rostock, Germany). The purpose of the database is to provide researchers around the world with easy access to detailed and comparable national mortality data via the Internet.[3] The HMD methodology has been used to validate German population statistics. In Germany, the last census was conducted in the West in 1987, and in the former East Germany in 1990.[4] In order to generate the population size, German vital statistics largely relies on the results from the last census and a component-method by births, immigrations, out-migrations, and deaths (*Bevölkerungsfortschreibung*). There is reason to believe that the population estimates that are generated from the *Bevölkerungsfortschreibung* are particularly distorted with growing distance to the last census, especially among the highest ages.

3 The database will contain original life tables for thirty-five countries, as well as all raw data used in constructing those tables. The raw data generally consist of birth and death counts from vital statistics, population counts from periodic censuses, and official population estimates. The general documentation and the steps followed in computing mortality rates are described in the methods protocol. There are datasets for East Germany, West Germany, and Germany Total for the period of 1955-2007 (http://www.mortality.org/).

4 The last "conventional" census of the German Democratic Republic was conducted in 1981. However, there were population registers in East Germany which provide reliable population counts. These registers were discontinued in 1990.

As shown in figure 1, the difference between the official and the recalculated population for men age 90+ in West Germany grows with the amount of time that has passed since the last census. Just after the West German Census in 1987, a sudden jump can be seen in the official population. This suggests that the population of males age 90 and over is strongly overestimated in German vital statistics (for more detail, see Jdanov et al. 2005; Scholz and Jdanov 2006). It may be hoped that the new census will improve the quality of the data available for studying mortality at higher ages.

Figure 1: Comparison of relative differences in population estimates in Germany 1960-2005 between official statistics and HMD



Source: own estimations

Socio-economic inequality in old age mortality

Relative socio-economic inequality in old age mortality is a major public health issue given the growing size of the elderly population and the sharp rise in absolute mortality with age. In the past, the international literature in this area was marked by the persistent absence of Germany. In many reviews of socio-economic mortality differences in Europe, Germany was not included. One reason for this is that, unlike in many other countries, German population statistics do not provide suitable data for mortality estimation by socio-economic status. Social science surveys can only partially fill this gap since the number of elderly subjects is too small for a robust estimation of mortality differentials in this kind of data. Furthermore, the survey data suffer from recruitment bias and the absence of people living in institutions. However, the situation has changed recently with the introduction of new policies enabling scientific analyses of administrative microdata. Data from the Research Data Center of the German Pension Insurance can now be used to evaluate mortality differentials among men aged 65 and older (Gaudecker and Scholz 2007; Shkolnikov et al. 2008; Himmelreicher et al. 2008).

The healthy migrant effect

It is known from several studies that migrants are healthier, and thus show lower mortality than the native population. This phenomenon has been described for various countries and ethnic groups, and holds true for both internal and international migrants. Generally, this development is explained by a special selection effect which may influence mortality and morbidity rates. This selective migration is thought to operate in two directions, which involve the movement of a "select group" of either the healthy or the unhealthy. The movement of healthier individuals is known as the so-called "healthy migrant effect." Conversely, it appears that sick migrants are involved in return migration, in order, for example, to be closer to family or to care-giving institutions. The latter phenomenon is also known as "salmon bias." For Germany, it is also important to consider whether migrants' low mortality rates are caused by inaccuracies in the vital statistics, for example, if doubtful data quality might contribute to migrants' "statistical immortality." Newly available data will help shed more light on this issue, specifically the Immigrant Survey of the Federal Institute for Population Research (BiB, *Bundesinstitut für Bevölkerungsforschung*) in Wiesbaden (Luy 2007), data from the German Pension Insurance (Kibele et al. 2008), and data from the German Central Register of Aliens (AZR, *Ausländerzentralregister*) (Kohls 2008).

3. Challenges and recommendations

Overall, the infrastructure for conducting fertility and mortality research has improved tremendously in recent years. Nevertheless, there are some "weak spots" in Germany's data infrastructure, which we will discuss in the following.

Family change and official statistics

Official statistics have always been slow in catching up to changes in the family. For a long time, the official UN definition of what is a family ignored new family forms, such as non-marital unions with children. This has changed in the recent years. In the UN recommendations for what is to be included in the census, co-residential partnerships are named among the core concerns (UN 2006: 113). Germany will be able to provide counts on co-residential unions based on data from the Microcensus. One drawback is that the question about partnership status, which is needed to identify a non-marital union, is voluntary, and about five percent of respondents refuse to answer the question (Heidenreich and Nöthen 2002). Since the share of non-marital unions has become such an integral demographic indicator, it seems odd that partnership status is one of the few questions in the Microcensus for which a response is not compulsory.

A related issue concerns stepfamilies. Families in which children live with biological and/or non-biological parents are on the rise, and they pose important new social policy questions. However, we do not have an accurate account of the share of reconstituted families in Germany. In the census, more complex living arrangements, such as stepfamilies, cannot be identified – despite the fact that the UN (2006) requested that this information be included in the census. Survey data, such as data from the Generations and Gender Survey, provide detailed information on family structure and living arrangements. However, sample sizes are too small to provide good "structural indicators" on the prevalence of reconstituted families. In the Microcensus, it is difficult to identify "stepfamily constellations," because the kinship status of the household members is only surveyed in reference to the head of the household.

It is difficult to make recommendations for resolving this problem. The household relationship matrix is usually seen as a superior method for surveying living arrangements (Statistical Commission and UN Economic Commission for Europe / Statistical Office of the European Communities; UN 2006: 107). If this method were introduced into the Microcensus, the share of stepfamilies in Germany could be established. However, this would obviously require a fundamental change in the Microcensus questionnaire.

Another solution could be to find out whether respondents may be asked if the stepparent, adoptive parent, or foster mother or father lives in the same household.[5]

Piecemeal changes in the field of family and fertility

While there has been significant progress made in improving Germany's data infrastructure, some changes remain incomplete. For example, it is certainly a great achievement that the number of biological children is now counted in the German Microcensus. However, it seems unfortunate that only women are asked about their fertility careers, since male fertility is also an important area for fertility and family researchers (Tölke and Hank 2005). In the social science dataset, it has become standard to ask both female and male respondents about their fertility careers. It seems socially regressive that, in the Microcensus, males have been filtered around the question concerning the number of biological children.

Finally, the Microcensus for fertility research would be tremendously enhanced if it included information on the ages at first, second, and additional births. Such a suggestion would certainly provoke another heated debate about whether the Microcensus questionnaire is already overloaded. However, a simpler solution could be found by repeating the *Frauenbefragung Geburten* on a regular basis to provide structural indicators of fertility change in Germany.

Socio-economic differences in mortality risks

In the field of mortality research, we must conclude that we still know too little about the mortality risks of immigrant populations. The data infrastructure for studying socio-economic differences in mortality risk could also be improved to keep pace with international developments in this area. We simply know too little about how mortality risks differ in Germany by educational level and socio-economic status. One way to improve this situation could be to establish a central mortality register similar to those that exist in other countries, such as Sweden or the US (Mueller 2008). However, this type of initiative will surely have to pass several administrative hurdles. An easier solution may be found by investigating ways that the Microcensus panel could be used for mortality research. Currently, it cannot be used for

5 The Microcensus already includes a question on whether the mother or father lives in the same household. However, it does not allow the respondent to distinguish whether he or she is a stepparent, adoptive parent, or foster parent. Legal regulations might make it impossible to ask respondents whether they have adoptive parents. However, a distinction between foster parents, stepparents, and biological or adoptive parents might present less of a legal problem.

this purpose because there is no systematic documentation of information on respondents who drop out – whether because they die or move to a different location. Finding a way to collect this information would not only increase the potential for using the Microcensus panel in mortality research, but would also expand the possibilities for employing the Microcensus panel in many other kinds of longitudinal research.

4. Conclusion

In this paper, we have described the significant progress that has been made in improving the data infrastructure for research on fertility and mortality in Germany. Nevertheless, additional changes and improvements could be made that would further increase our understanding of fertility and mortality processes. In terms of furthering research in these areas, we have argued that we need better structural indicators to capture family change in Germany. This would include making official counts of *reconstituted families* and also raises the possibility of making the question on *partnership status* compulsory in the Microcensus. In the field of mortality research, we stressed that we need better estimates of the *mortality risks of migrants,* and a better understanding of the *socio-economic determinants of death*. In this context, we pointed out the potential of the Microcensus to help fill the gap in data collection.

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