

How Divorce impacts Health and Mortality in Germany: Evidence from the Combined Demographic Histories (CDH)

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In collaboration with: Frederike Basedow, Daniel Brüggmann, Martin Brünger, Jennifer-Marie Burchardi, Paul Gellert, Pavel Grigoriev, Kar Man Tan

Abstract: In this project, we examine how divorce impacts health and mortality in Germany. For this purpose, we compiled a new dataset: the *Combined Demographic Histories (CDH)*. The CDH integrates various types of register data from the German Pension Fund into a single, comprehensive source. It includes information on employment, earnings, health, mortality, and selected family-related variables. The dataset opens up new avenues for research at the intersection of employment, health, and mortality, as well as certain aspects of family life, such as female fertility and divorce. The data covers the period from 2011 to 2024 and includes a random sample of 20% of the population in Germany with a pension account (approximately 15 million persons per year). In this poster, we illustrate the setup of the data and present initial results on the association between divorce and health diagnosis. The data will be available for on-site use at the German Pension Fund, starting in June 2026. An off-site Scientific Use File will be released in early 2027.

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1 Introduction

Register data provide a valuable source for social science research. While they typically include a smaller range of variables compared to survey data, their large sample sizes and the high quality of many variables make them a powerful tool for empirical analysis. Germany offers unique opportunities for register-based research through the pension registers of the German Pension Fund (*Deutsche Rentenversicherung*). These data have been utilized in various fields, including employment, earnings and public pension dynamics (Artmann et al. 2023), fertility (Andersson et al. 2014), divorce (Brüggmann and Kreyenfeld 2023; Keck et al. 2020), and mortality research (Shkolnikov et al. 2008). Moreover, since the pension registers also administer the medical rehabilitation, they have enabled extensive research in the field of health and rehabilitation. Several datasets from the German Pension Fund are available as Scientific Use Files:

- The **VSKT** (*Versichertenkonstentstichprobe*) is arguably the workhorse among them, providing complete monthly employment and earnings histories for a sample of the active population.
- The **AKVS** (*Aktiv Versicherte*) also offers employment and earnings information, albeit only on an annual basis. Unlike the VSKT, which is a sample, the AKVS includes the entire register population.
- For mortality researchers, the **RTWF** (*Rentenwegfall*) is a key source of information.
- For health researchers, the **RSD** (*Reha-Statistik-Datenbasis*) plays a central role.
- Family researchers benefit from the **VA** (*Versorgungsausgleichstatistik*), which includes information on divorce, offering novel opportunities for studying family dynamics.
- For persons interested in retirement, the **RTNB** (*Rentenbestand*) is the core source.

While these datasets are often used as stand-alone files, the **CDH** integrates the multiple sources into a single comprehensive dataset. This integration opens new avenues for register-based research in Germany. For instance, combining employment and health data creates unique opportunities to analyze health in relation to employment, earnings, and retirement transitions. Moreover, the combination of mortality data with employment, earnings, and prior health histories

allows researchers to explore socioeconomic differences in mortality—filling an important gap in German social science research.

2 Data format and linkage of registers

The core of the CDH is a combination of three datasets from 2011: AKVS (actively insured persons), RTBN (pensioners) and LTVS (latently insured persons). AKVS includes all individuals in Germany with an active pension account in 2011. These are not only regularly employed persons but also persons with contributions for other causes such as unemployed, parental leave, taking care of elderly relatives. RTBN (*Rentenbestand*) includes those individuals who are currently receiving a pension and are therefore not part (anymore) of the AKVS. The so-called “latently insured” (*Latent Versicherte*) are individuals who are not actively paying contributions but who did so in the past. For example, this group can include civil servants (*Beamte*) who previously held a public pension account but whose account is currently inactive. Although we have limited information on these individuals—apart from, for instance, their eventual dates of death—we include them in the dataset to achieve the most comprehensive population coverage possible.

From this core, the so-called “base”, we draw a 20% random sample. By the following year (2012), a small fraction of the 2011 population will have died. To replenish the dataset, we add individuals who, for the first time in their lives, enter the AKVS in that year. We continue in the same logic for the following years (see Figure 1).

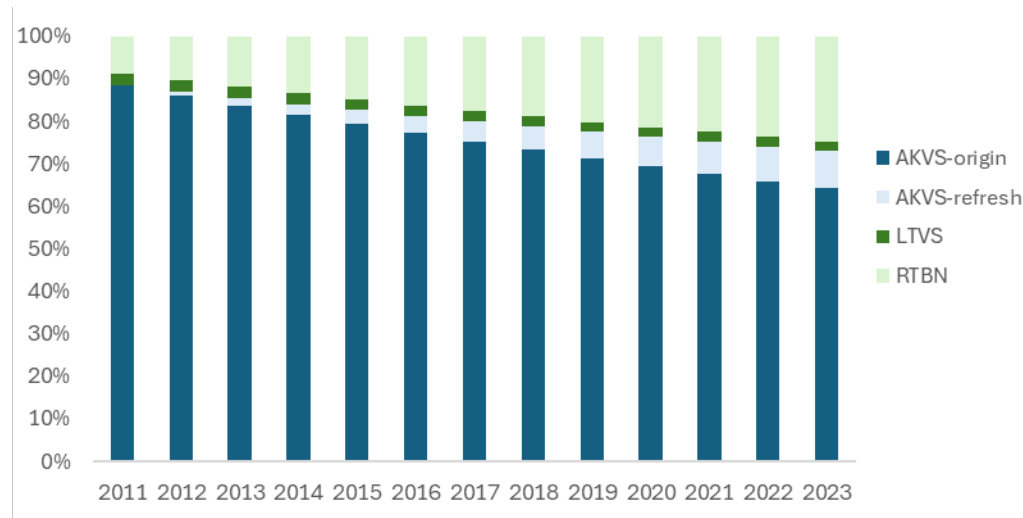


Figure 1: Data set up

A unique identifier allows to enhance the information in the base with additional information from other datasets (see Figure 2). E.g. dates of divorces can be drawn from the VA (*Versorgungsausgleichstatistik*) or information on deaths can be merged from the RTWF (pension termination). However, several particularities should be noted. The RSD dataset contains rehabilitation information only for individuals who are active in the labor market, but not for those who are retired. Therefore, it cannot be linked to the RTBN dataset, meaning we do not have health information for retired individuals. This additional information is stored as separate files and can be merged by the researcher using the unique identifier.

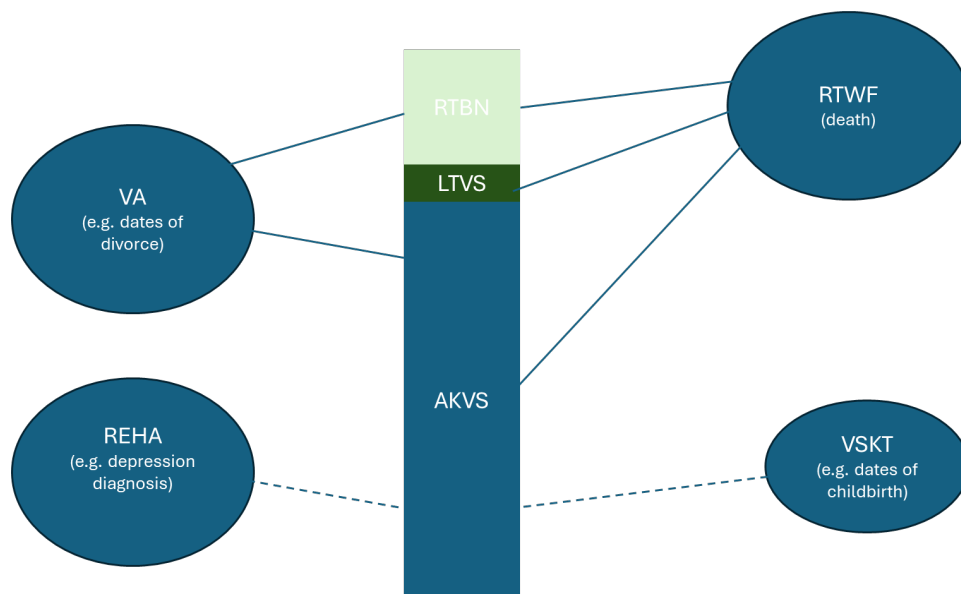


Figure 2: Linking the register data

The dataset is organized in long format, meaning there is one entry per person per year. For divorce, childbirth, and death, fixed variables indicate the year in which each event occurred (see Figure 3).

ID	Year	SES	ICD10	YearDeath	YearFirstDivorce	YearofFirstChild
1	2011	employed	.	2020	2012	1996
1	2012	employed	.	2020	2012	1996
1	2013	employed	.	2020	2012	1996
1	2014	employed	F32.2	2020	2012	1996
1	2015	employed	F32.2	2020	2012	1996
1	2016	employed	F32.2	2020	2012	1996
1	2017	employed	.	2020	2012	1996
1	2018	employed	.	2020	2012	1996
1	2019	retired	.	2020	2012	1996
1	2020	retired	.	2020	2012	1996
1	2021	.	.	2020	2012	1996
1	2022	.	.	2020	2012	1996
1	2023	.	.	2020	2012	1996

Figure 3: Linking the register data

3 Example Application: Demonstrating the Potential of the CDH Register Data

To illustrate the unique potential of the CDH data for the German context, we have calculated annual diagnosis rates (based on rehabilitation measures) for persons aged 30-59 by sex and marital status. For example, the richness of these data allows us to draw on objective diagnosis information from rehabilitation episodes and to assess differences in incidence rates across groups—including smaller populations such as divorcees. Diseases were classified into seven

major categories based on the affected organ system or type of disorder. **Cancer** includes all malignant and benign tumors (ICD-10 codes C00–C97). **Mental** encompasses psychiatric conditions, mood disorders, and other behavioral health issues (ICD-10 codes F00–F99). **Nervous System** covers conditions such as epilepsy, Parkinson’s disease, and multiple sclerosis (ICD-10 codes G00–G99). **Heart** includes heart disease, hypertension, stroke, and other circulatory disorders (ICD-10 codes I00–I99). **Respiratory** comprises asthma, chronic obstructive pulmonary disease, pneumonia, and other lung-related conditions (ICD-10 codes J00–J99). **Muscular** includes diseases of the musculoskeletal system and connective tissue, such as arthritis and osteoporosis (ICD-10 codes M00–M99). All remaining diseases were grouped under **Other**, which includes infectious and parasitic diseases (A00–A09), diseases of the blood and blood-forming organs (D50–D89), endocrine, nutritional, and metabolic diseases (E00–E90), diseases of the eye and adnexa (H00–H59), diseases of the ear and mastoid process (H60–H95), diseases of the digestive system (K00–K95), and diseases of the skin and subcutaneous tissue (L00–L99).

The analysis indicates that recently divorced individuals exhibit a substantially increased risk of mental health diagnoses (see Figure 4). Cardiovascular conditions are also elevated, though to a somewhat lesser extent. When examining sex differences, divorced women are particularly affected by elevated risks of mental health disorders, whereas divorced men show a higher increase in cardiovascular risk. These findings highlight the differential health impacts of marital dissolution across sexes and disease types.

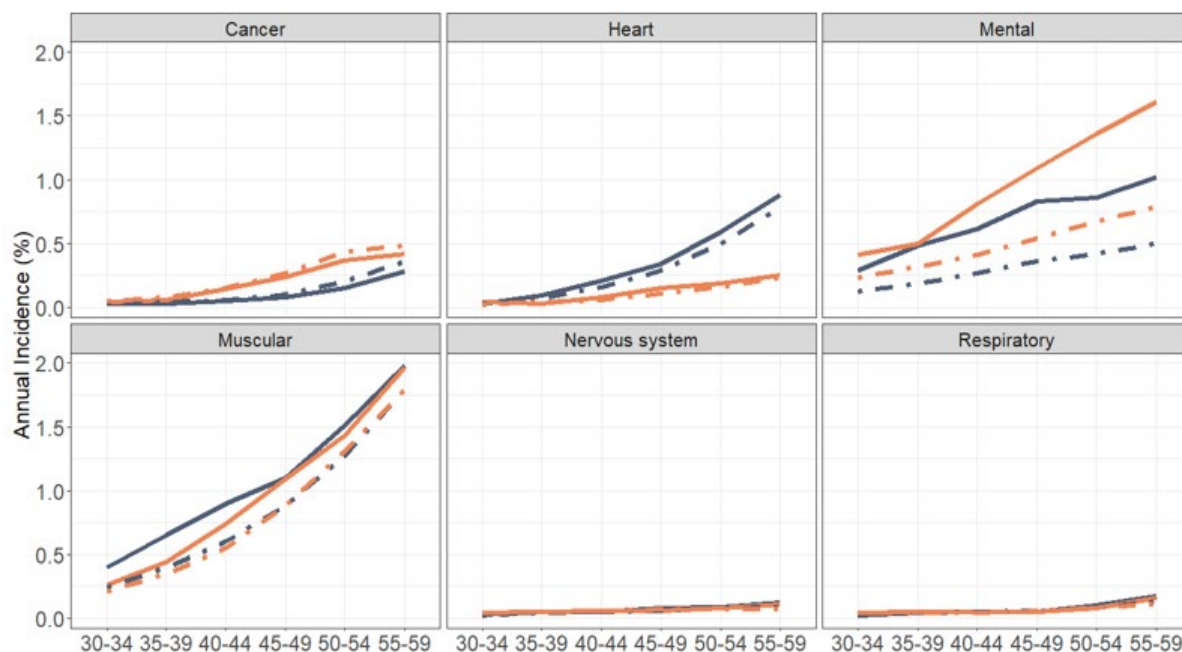


Figure 4: Diagnosis by age and sex (red: women; blue: men) and marital status (dotted line: population; straight line: divorced within the last three years) Source: First results based on CDH-data, see also (Molina et al. 2025)

4 Publication bibliography

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