

REDUCTIONS IN THE INCIDENCE OF  
CARE NEED IN WEST AND EAST  
GERMANY BETWEEN 1991 AND 2003:  
COMPRESSION-OF-MORBIDITY OR  
POLICY EFFECT?

UTA ZIEGLER\*  
GABRIELE DOBLHAMMER

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\*corresponding author  
both authors work at:  
University of Rostock  
Wirtschafts-und Sozialwissenschaftliche Fakultät  
Lehrstuhl für empirische Sozialforschung  
Ulmenstrasse 69  
18057 Rostock  
Germany

e-mail: ziegler@demogr.mpg.de  
doblhammer@demogr.mpg.de  
tel.: +49-381-4984393; +49-381-4984396  
fax: +49-381-2081498; +49-381-2081424

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## Abstract

Is the increase in the share of the older population in Germany inevitably connected with a parallel increase in frail people? We analyse the development of care need in West and East Germany between 1991 and 2003 on the basis of longitudinal data from the German Socio-Economic panel. A lower transition risk into care need for men exists in the period 1998-2003 as compared to the period 1991-1997. However, we are not sure if this effect is influenced by the introduction of the public Long-Term Care Need Insurance in 1995.

## Introduction

The German population is aging. Between 2001 and 2050 the share of the population aged 60+ will increase from 24% to 37% and the share of over 80-year-olds will even triple from 3,9% to 12% (1). In 1950 this share of people aged 60+ and 80+, respectively, was still 14% and 1,0% in West Germany and 16% and 1,0% in East Germany. The assumptions from the Statistical Office concerning life expectancy that underlie these projections must be seen as conservative. It is very likely, that the life expectancy in Germany in 2050 is higher than currently assumed (2).

Is an increase in the proportion of older people inevitably connected with an increase of frail people? The following three hypotheses have been put forward: the expansion-of-morbidity hypothesis (3; 4; 5; 6), the compression-of-morbidity hypothesis (7) and the hypothesis of the dynamic equilibrium (8). No consistent pattern for all countries nor for time could be demonstrated, yet. Recent studies, however, generally draw a positive picture for various countries (9; 10; 11; 12; 13). For an international review about disability trends among elderly people see: (14; 15; 16). While Jacobzone et al. (15) project a compression of morbidity in OECD countries, Robine et al. (14) also point out, that a redistribution of the levels of disability took place - besides the decrease of the most severe levels, an increase in the prevalence of the less severe levels occurred. This would rather support the dynamic equilibrium hypothesis from Manton (ibid).

This paper explores trends in the incidence of care need in Germany over the period 1991 to 2003 with data from the German Socio-Economic Panel. From the various disability measurements we chose care need, because we want to specify people who are dependent on the help of other people. However, we have to be aware that our results might be influenced by political changes regarding care during that time. In April 1995 the Long-Term Care Insurance (LTCI; Social Statutes XI - SGB XI) was introduced in Germany. It allowed payments for home care and from July 1996 also payments for nursing home care. 90% of the German population are covered by this public insurance and about 9% by a private health insurance. Before that time care was primarily the responsibility of the family and

only in very severe cases it was covered by the state by tax-money (17).

## Data and Method

### Data

We use data from the German Socioeconomic Panel (SOEP) to analyse the change in the incidence of care need in Germany between 1991 and 2003. This yearly panel study started in 1984 in West Germany with 5921 households in which 12290 people above age 16 were surveyed. In 1990 East Germany was included in the panel with 2179 households and 4453 people. 18.3% of the total German population was living in East Germany in 2000, but due to the oversampling in the SOEP, about 27% of the surveyed people were living in East Germany.

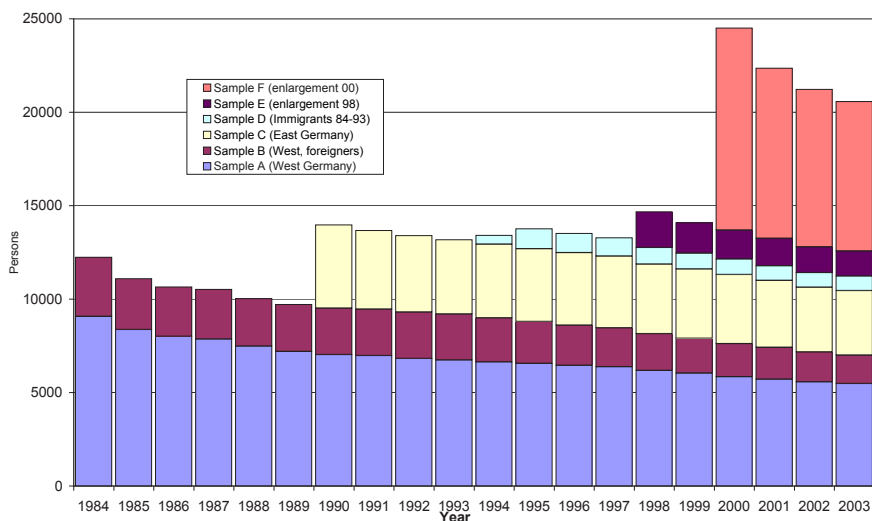
3,912 persons aged 60+ were observed in the period 1991 to 2003. 1,735 (44%) of them were males and 2,177 (56%) females. Compared with the German population, where the share of the male population above age 60 is 42% in 2000, the males are slightly oversampled in our data.

Our data from the SOEP consist of seven samples. The original samples that exist since the start of the SOEP are sample A, "residents in the FRG" and sample B "Foreigners in the FRG". In 1990 sample C has been drawn from "German Residents in the GDR". In 1994/95 an "Immigrant" sample was added and to overcome panel attrition new people were included in 1998 (sample E "Refreshment") and 2000 (sample F "Innovation") (18). For the analyses we use samples A and C from 1991 until 2003.

Figure 1 displays the graphical distribution of the different samples. In longitudinal data sets panel mortality is an unavoidable problem. Besides natural missings due to deaths there are a lot of losses due to response refusals. These losses from response refusals become problematic if they evolve from systematic non-response. It can be assumed that people in a bad state of health are more often unable or unwilling to answer the interview. However, Heller and Schnell (19) and Unger (20) do not find significant differences between healthy and disabled people. In our data 43% of the total 52,126 person-years are spent in the period 1998-2003. 65% of the person-years are in the marital status 'married', 26% in the marital status 'widowed' and only 6% and 3% in the marital status divorced and single, respectively. 67% of the time people live together with a partner.

Information about education is missing for 40 people. Most people, 2,794 or 71% have basic education (Haupt- or Volksschule, 8 or 9 years) or no degree. 653 people (17%) have medium education (Realschule or POS, 10 years), 385 people (10%) report high education (Abitur, Fachhochschule or EOS, 12 or 13 years) and 40 people (1%) declared to have a different degree. The high proportion of people with no or basic education is not surprising since nearly all people have finished their education before the onset of the expansion of education which started in the 60s (21; 22).

Figure 1: Longitudinal development of the Samples A to F in the SOEP



Source: SOEP

The available question to analyse care need in the SOEP is: "Does someone in your household need constant care due to old age or illness?" (if yes, with: errands outside the house, running the household (including preparation of meals and drinks), simple personal care (dressing, washing, etc.), difficult personal care (getting in and out of bed, bowel movement etc.). For this analysis the categories 'help needed with simple personal care' and 'help needed with difficult personal care' are used to describe the transition into care need. For a better comparability of West and East Germany the analysis time starts in 1991 when the question about care need was then available in both parts of the country.

A disadvantage of the panel is, that it only includes private households. We do not have information about the people in need of care who live in institutions (about 30%). This population is different from people in need of care in private households: usually they do not have a partner or children who could look after them when they need care. Since they are not included in the panel, we cannot explore whether a possible change in the risk of care is caused by a changing composition of private and institutional households. However, the proportion of people in need of care in private households is nearly the same in 1991 and 2001, namely 71% and 70% respectively (23; 24).

## Method

The event studied is the transition into care need which occurs the first time a person states to be in need of care. People are censored when they are lost to follow-up or at the end of the survey period when they are still healthy. Both

events and censoring are treated as having occurred half a year after the last interview. People who temporarily drop out of the panel for one year and return thereafter are kept in the data set. No information about care need is collected for this missing year, and we treat them as not been in need of care. Due to the panel structure of the data the cases are left truncated in 1991 and we exclude people who were already in need of care at the baseline.

An event-history analysis is applied to the longitudinal data. To measure the age dependent hazard of care  $\mu(x)$  multiplicative intensity-regression models are estimated. The process starts when people are healthy and at least 60 years old. It ends when they either become dependent on care or when they drop out, die or are still healthy at the end of the observation period. To estimate the force of care at age  $x$  we use a piece-wise constant model of the form:

$$\mu(x) = h(x) + \sum_{k=1}^7 \beta_k * X_k. \quad (1)$$

The baseline hazard  $h(x)$  is a piece-wise constant step-function with 5-year age groups; only the last age group consists of 10 years;  $\beta_k$  denotes the unknown parameters and  $X_k$  the indicator variables, that take the value '1' if a characteristic applies, and '0' otherwise. The parameters are estimated by maximizing the likelihood function.

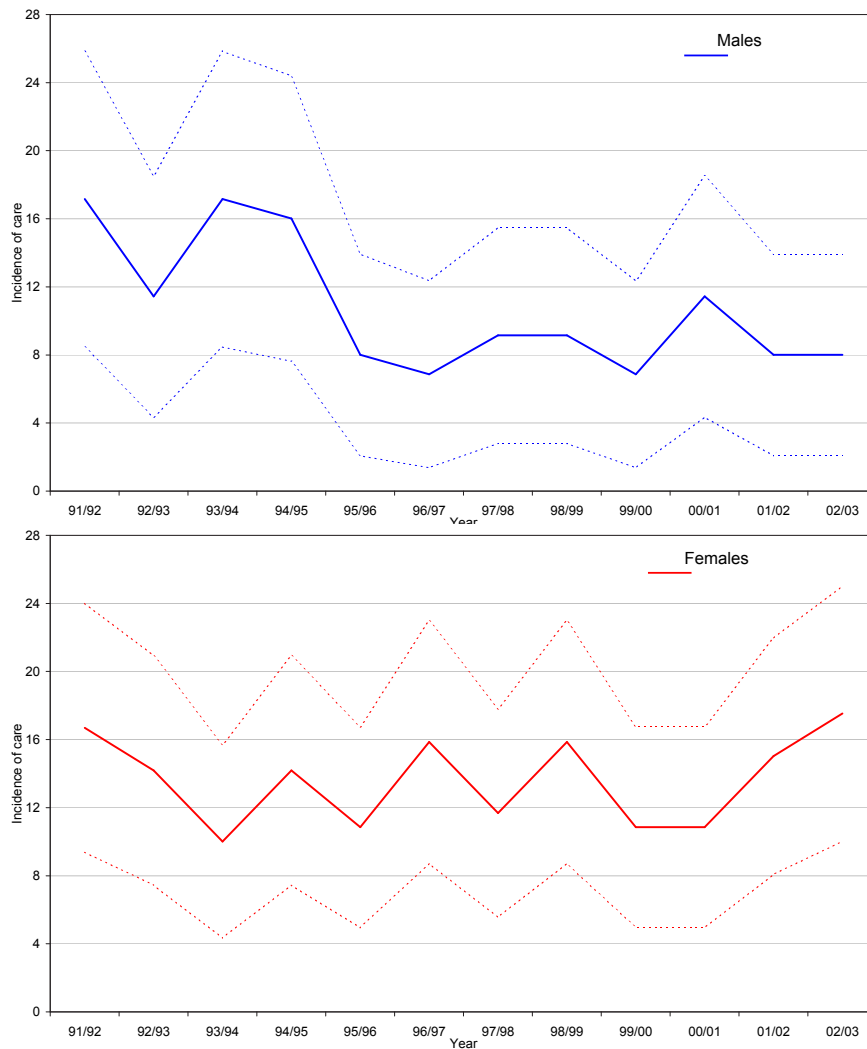
The model contains two time-constant and four time-varying covariates. The time-constant variables are 'sex' and 'education' with the categories low education (maximum 8 or 9 years of schooling with no degree or a degree from the Haupt- or Realschule), middle education (10 years, Realschule or POS) and high education (at least 12 years of education, Gymnasium or EOS). The time-varying variables are 'region' which takes into account West and East Germany, 'period' which is divided into two intervals from 1991 to 1997 and from 1998 to 2003, 'marital status' with the four categories married, widowed, single, divorced and the variable 'existence of partner'.

## Results

Between 1991 and 2003, 309 people declared to have become dependent on care, which corresponds to a share of 7.9% of the population above the age of 60.

Figure 2 shows the age standardized incidence of care for males and females per 1000 person years in the study period. For males there is an abrupt decline in the incidence of care from the year 1994/95 to 1995/96 which, however, is not significant. For females incidences remain unchanged. We do not find a significant difference between males and females.

Figure 2: Trends in the age standardized incidence of care (per 1000 person years) for German males and females between 1991/92 and 2002/03 (with 95% confidence intervalls)



Source: SOEP

In Table 1 the results are presented for the multivariate model based on equation 1. Model 1 shows the main effects of the variables, model 2 and 3 additionally the interactions between region and period, and sex and period. Model 1 reflects the results from the descriptive analysis of care incidence. We find an 11% lower transition risk for the second period which, however, is not significant ( $p=0.31$ ). There are no differences between males and females and also West and East Germany have about the same transition risk into care need. Compared to people with basic education those with higher education have a much lower transition risk. It is significantly lower by 36% ( $p=0.01$ ) for people with medium education, and 21% ( $p=0.29$ ) lower for people with high education. Never married have a 39% ( $p=0.31$ ) lower risk, divorced an 11% ( $p=0.78$ ) lower risk and widowed an 9% ( $p=0.78$ ) lower risk than married people. However, since these groups are very small, the results are not significant. A positive, but not significant effect of living with a partner exists, the risk is 12% ( $p=0.73$ ) lower.

Table 1: Relative risk of care for people above age 60 in Germany 1991-2003

	Model					
	M 1	<i>p</i>	M 2	<i>p</i>	M 3	<i>p</i>
<b>Sex</b>						
Male	1		1			
Female	1.02	0.90	1.02	0.90		
<b>Period</b>						
91-97	1					
98-03	0.89	0.31				
<b>Region</b>						
West Germany	1				1	
East Germany	1.03	0.80			1.04	0.78
<b>Education</b>						
Missing	0.51	0.24	0.51	0.25	0.49	0.22
No/low degree	1		1		1	
Medium degree	<b>0.64</b>	<b>0.01</b>	<b>0.64</b>	<b>0.01</b>	<b>0.64</b>	<b>0.01</b>
High degree	0.79	0.29	0.79	0.28	0.79	0.27
Other degree	0.72	0.52	0.72	0.52	0.76	0.58
<b>Marital status</b>						
Married	1		1		1	
Single	0.61	0.31	0.61	0.31	0.61	0.32
Divorced	0.89	0.78	0.89	0.78	0.89	0.77
Widowed	0.91	0.78	0.91	0.78	0.91	0.80
<b>Partner</b>						
No	1		1		1	
Yes	0.88	0.73	0.88	0.73	0.88	0.73
<b>Interactions</b>						
<b>Region &amp; Period</b>						
West G. 1991–1997			1			
West G. 1998–2003			0.87	0.32		
East G. 1991–1997			1.01	0.97		
East G. 1998–2003			0.94	0.72		
<b>Sex &amp; Period</b>						
Male 1991–1997					1	
Male 1998–2003					<b>0.63</b>	<b>0.02</b>
Female 1991–1997					0.83	0.25
Female 1998–2003					0.89	0.48
-2 log likelihood	1423.51		1423.44		1418.90	

Source: SOEP



The interaction in model 2 between region and period shows no difference between West and East Germany in period 1. Over time we see a decrease in the transition risk into care need for the second period for both regions. It is 13% lower for West Germany and 6% lower for East Germany, but not significant. Model 3 shows that the improvements of the transition risk in the baseline-sample primarily result from men. In the first period females have a lower risk than males, which hardly changes in the second period, even slightly increases. Males on the other hand experience a 37% ( $p=0.02$ ) decrease in the transition risk into care need which in the second period is even lower than the risk of females. Contrary to the univariate analysis the decrease in the care need of males over time is significant in this multivariate model.

## Discussion

Our study shows a slight decrease in the risk of care need between the periods 1991-1997 and 1998-2003. The decrease primarily results from men and is stronger in West than in East Germany.

This is the first study that analyses trends in care need in Germany on the basis of a longitudinal data set. Our findings are consistent with previous results for Germany which show generally a positive development regarding active life expectancy, and, thus, support the compression-of-morbidity hypothesis. Dinkel (25) attests for West Germany an increase in active years between 1978 and 1995 with data from the German Microcensus and Klein and Unger (26) use data on disability from the SOEP from 1984 to 1998 and come to similar conclusions.

But is it really a compression of morbidity or is it a policy effect? For females no change can be seen and the decrease we find for males is a rather abrupt change between 1994/95 and 1995/96 which coincides with the introduction of the care need insurance (Pflegeversicherungsgesetz (SGB XI)) in the year 1995. Incidence rates before and after this change are stable. One possibility could be that the introduction of the care need insurance has influenced panel attrition due to an increased movement of men to institutions in this year. We calculated panel attrition for people who rate their healths in the last year before they leave the panel as bad or very bad and do not die in the following year. We find a slightly higher proportion of men with poor healths for the years 1994/95 and 1995/96 (1.3% compared to 0.9% in 1996/97-2001). However, the effect is too small to cause the lower incidence in 1995/96. When we reduce the 1.3% panel attrition in these years to 0.9% and distribute the excess as people in need of care evenly over the following years we still find an abrupt decline. Therefore panel attrition cannot explain the abrupt change in the incidence of care need between the years 1994/95 and 1995/96. We can only speculate whether the introduction of the care need insurance led to a different perception of care need among people who were not found eligible to receive allowances from the care need insurance.

We find an equal transition risk into care need for males and for females. From the literature, however, it is widely known that women spend a higher proportion of their lives in disability. (e.g. (14; 20; 27)). This higher prevalence of disability also translates into a higher care need prevalence. Data from the ministry for health and social security and results from a study about care need in private households in Germany Schneekloth and Leven (28) show that in 2002 of the 1.3 million people in need of care at home 64% are women. In the SOEP data the higher prevalence for women is confirmed in own calculations, which are not presented in this paper. A higher prevalence, however, does not imply higher incidence rates, since women live longer than men. The literature generally supports our results (29), but also shows some recent studies, where higher incidence rates for women were found (29) (30).

Education here is used as a proxy for socio-economic status. We find lower transition risks for people with at least medium education which is consistent with other studies (e.g. (20; 31; 32; 32; 33; 34; 35; 36; 37)). Our results show a lower risk for divorced, widowed and especially never married people compared to married people. The SOEP, however, does not include the institutionalized population and the marital status differentials in our study may therefore be confounded by health selection. Not married elderly are to a higher degree dependent on professional help than married and have therefore a higher likelihood to live in an institution. In the SOEP, thus, among the unmarried only the healthy will remain.

## What this paper adds

- This is the first longitudinal study on care need in Germany for the period 1991 to 2003
- Between 1991 and 2003 we find a decreasing incidence of care need for men, but no change for women
- Other longitudinal studies on disability for Germany suggest a compression-of-morbidity. Our study raises the question whether the decrease in care need is caused by improvements in health or whether it is a policy effect due to the introduction of the care need insurance.

## Policy implications

Further research is needed to find out if our results suggest a compression-of-morbidity or are caused by a policy effect due to the introduction of the public care need insurance. The first result would mean that the gained years in life expectancy would be spent in good health. If the second explanation holds true

then a parallel increase in the number of people in need of care with the general aging of the population has to be taken into account.

## Conclusion

Our analyses show a decrease of the transition risk into care need for males between the periods 1991-1997 and 1998-2003 in Germany. However, we cannot be sure if this effect is due to a compression of morbidity or if it is a policy effect. On the one hand the abrupt change between the years 1994/95 and 1995/96 coincides with the introduction of the care need insurance. Thus, an influence of external factors such as different perceptions of care need cannot be excluded. On the other hand the results might be real effects. East German living conditions have assimilated to the West German standards. Today's elderly increasingly have higher education than previous cohorts. Higher education raises the awareness of the importance of healthy behaviour in the population. Less and less cohorts of men have participated in the war and are thus harmed by an injury. Medical acquisitions have improved the quality of life. These factors make it likely that the care risk has declined due to improved health and, thus, the gained years in life are spent in good health. Future research is needed to decide between the two competing explanations.

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