

Gender gaps in pensions and health: Germany, France, and Denmark

By Peter Haan, Anna Hammerschmid and Carla Rowold

This study quantifies genderspecific differences in retirement income in Germany, Denmark, and France. We show that the “gender pension gap” in Germany is higher than in France and much higher than in Denmark. This ranking is similar to the ranking in the gender pay gap, where Germany has also the highest gender difference.

The authors also investigate genderspecific differences in health, i.e. the so-called “gender health gap”, in the same age group. Self-assessed general health in 2013 reveals no significant differences between men and women in the countries studied. However, gender-specific differences in depressive symptoms follow a similar pattern as the gender pension gap: Denmark has the lowest difference between the sexes.

Although the study does not measure causal relationships between income and health, the results indicate that measures to reduce the gender pay gap do not only reduce differences during the economically active phase; they may also lead to a reduction in the gender pension gap and in women’s susceptibility to depressive symptoms.

On average, women earn less in the labor market than men.¹ In 2015, the *gender pay gap*, which measures this difference, was 22 percent in Germany.² Pension claims under the German public pension fund depend directly on earnings. Thus, the difference in earnings translates into differences in pensions.³ The *gender pension gap*, which indicates the difference in pension claims between men and women, maps the lifelong inequality between the sexes. Alongside the difference in earnings, the gap is affected by factors such as career interruptions due to care for children or relatives, labor market segregation, differences in working hours, and general gender-specific social norms and stereotypes.⁴

The existence of a gender pension gap means that women have less financial resources from their own entitlements compared to men of the same age.⁵ A number of studies have shown that there is a relationship between socioeconomic status and health.⁶ Further, the literature doc-

1 See the definition of *gender pay gap* in the DIW glossary (in German only; available online, accessed September 27, 2017; this also applies to all other online sources in this report, unless stated otherwise). The literature explores numerous reasons for this gap, citing for example profession or training to explain part of the differences between men and women. However, discrimination against women in the labor market has been documented. See Anne Busch and Elke Holst, “Verdienstunterschiede zwischen Frauen und Männern nur teilweise durch Strukturmerkmale zu erklären,” *DIW Wochenbericht* no. 15 (2008): 184-190 (available online)

2 See Eurostat, “Gender pay gap in unadjusted form,” 2017 (available online)

3 See Markus M. Grabka et al., “Der Gender Pension Gap verstärkt die Einkommensungleichheit von Männern und Frauen im Rentenalter,” *DIW Wochenbericht* no. 5 (2017): 87-96 (available online).

4 See Francesca Bettio, Platon Tinios, and Gianni Betti, “The gender gap in pensions in the EU,” Publications Office of the European Union, Luxembourg, 2013 (available online); Judith Flory, “The Gender Pension Gap. Developing an Indicator Measuring Fair Income Opportunities for Women and Men,” study for the German Federal Ministry for Family Affairs, Senior Citizens, Women and Youth (2011) (available online); Ilze Burkevica et al., “The gender gap in pensions in the EU, Research note to the Latvian Presidency,” Publications Office of the European Union, Luxembourg, 2015 (available online); Platon Tinios et al., “Men, women and pensions,” Publications Office of the European Union, Luxembourg, 2015 (available online); and Athina Vlachantoni, “Financial inequality and gender in older people,” *Maturitas* 72 (2) (2012): 104-107.

5 The gender pension gap can potentially be narrowed in the household context. This reduces the gender-specific differences in financial resources.

6 See Mauricio Avendano, Arja R. Aro, and Johan Mackenbach, “Socio-Economic Disparities in Physical Health in 10 European Countries.” In *Health, Ageing and Retirement in Europe*, edited by Axel Börsch-Supan et al., MEA Eigenverlag, Mannheim, 2005 (available online); Thomas Lampert and Lars Eric

uments a causal effect of income on both general and mental health.⁷ These findings indicate that countries with particularly high gender-specific pension gaps could also have large gender differences in health. We therefore examine whether there are similar cross-country patterns between gender-specific differences in health and retirement income.⁸

To better analyze and interpret the results, we compare Germany with other countries. Such a comparison allows us to capture the typical health differences between men and women and possible differences in the response behavior between the two groups. We compare the patterns in the gender health gap over time and between countries with different labor markets and gender pay gaps. Therefore, our study focuses on Germany, France, and Denmark.

The labor markets in these three countries differ in several dimensions. Denmark had the lowest gender pay gap in 2015 (15.1 percent) and the highest rate of female employment (70.4 percent). Of women in employment, only 25.8 percent work part-time. In France the pay gap is 15.8 percent, and the rate of female employment is the lowest of the three countries (61.1 percent). However, the proportion of women in part-time work is also the lowest (22.3 percent of all women in employment). In comparison to Denmark and France, in 2015 Germany had both the highest gender pay gap and the highest part-time rate among women in employment (37.4 percent). At 69.9 percent, the overall rate of female employment in Germany comes close to that of Denmark.⁹ The three countries included in the present study therefore exhibit different degrees of gender inequality in the labor market. At the same time, the pension system in each country is different. In Germany and France, for example,

Kroll, "Einfluss der Einkommensposition auf die Gesundheit und Lebenserwartung," *DIW Discussion Paper* no. 527 (2005) (available online); Regina Jutz, "The role of income inequality and social policies on income-related health inequalities in Europe," *International journal for equity in health* 14 (1) (2015): 117. For the United Kingdom: Sara Arber and Jay Ginn, "Gender and inequalities in health in later life," *Social science & medicine*, 36(1) (1993): 33-46. This study shows that even after controlling for age and career level, the incomes of older men and women have an effect on the self-assessment of their health.

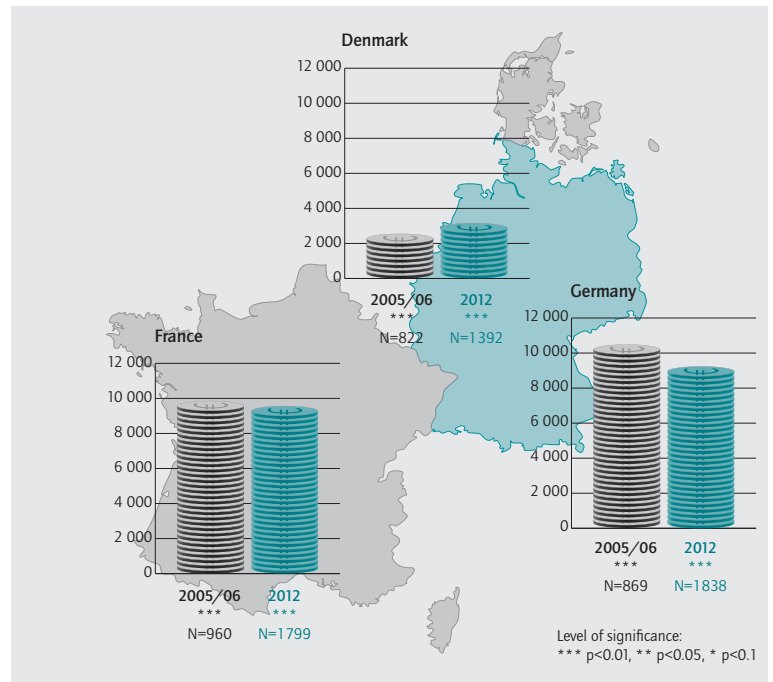
7 See Mikael Lindahl, "Estimating the Effect of Income on Health and Mortality Using Lottery Prizes as an Exogenous Source of Variation in Income," *The Journal of Human Resources* vol. XL no. 1 (2005): 144-168 and Marta Lachowska, "The Effect of Income on Subjective Well-Being: Evidence from the 2008 Economic Stimulus Tax Rebates," *The Journal of Human Resources* vol. 52 no. 2 (2017): 374-417.

8 Previous studies have documented that on average, women have poorer health than men. Even though women also have a higher average life expectancy than men, there is a gender health gap. See Deborah L. Wingard, "The sex differential in morbidity, mortality, and lifestyle," *Annual review of public health* 5(1) (1984): 433-458 and Johan Mackenbach et al., "Physical health." In *Health, Ageing and Retirement in Europe*, edited by Axel Börsch-Supan et al., MEA Eigenverlag, Mannheim, 2005 (available online).

9 See OECD, "Employment-population ratios," Paris, 2017 (available online); see Eurostat, "Gender pay gap in unadjusted form" and OECD, "Incidence of FPT employment - common definition," Paris, 2017 (available online).

Figure 1

Absolute gender pension gap in Denmark, Germany, and France
Controlled for age, in Euro



Source: SHARE; authors' own calculations, weighted. The numbers indicate the absolute value of the gaps between men and women.

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In absolute terms, the gender pension gap is much narrower in Denmark than in Germany and France.

there is a comparatively stronger relationship between public pension and earned income before retirement.¹⁰

In the following section, we first show the gender pension gaps in all three countries. The pension claims include all three pillars of old age provision: public, private, and occupational pensions (see box). In the second section, we discuss the gender health gap and compare it to the gender-specific pension gaps in the three countries.

Gender pension gap in Germany above 50 percent

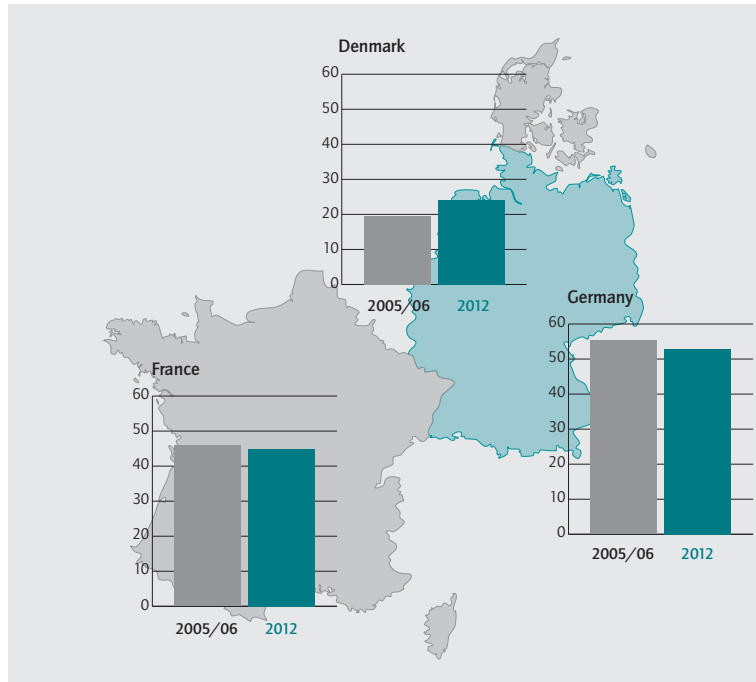
In 2005/2006, the age-adjusted pension gap between men and women is 55.2 percent in Germany. On average, the pensions that men between 65 and 85 receive

10 See OECD, "Pensions at a Glance 2007: Public Policies across OECD Countries," Paris, 2007 (available online, accessed September 12, 2017); and OECD, "Pensions at a Glance 2013: OECD and G20 Indicators," Paris, 2013 (available online, accessed September 12, 2017).

Figure 2

Relative gender pension gap in Denmark, Germany, and France

Controlled for age, in percent



Sources: SHARE; authors' own calculations, weighted. The numbers indicate the absolute value of the gaps between men and women.

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Germany has the widest gender pension gap and Denmark the narrowest.

are over twice as high as those of women in the same age group (see Figure 2). This difference corresponds to an average absolute difference of 10,341 euros per year (see Figure 1). In 2012, the slightly lower gender pension gap is still at 52.9 percent, corresponding to on average 9,268 euros.^{11 12}

In both France and Denmark, the relative gender pension gap is lower. In France, it is almost ten percentage points lower than in Germany in 2005/2006, and closes

11 The gender pension gap calculated here is somewhat higher than the value for the public pension fund calculated in Grabka et al., "Gender Pension Gap." This discrepancy can potentially be explained by differences in the database or a different sample selection. Further, in this study we also include occupational and private pensions.

The pension gap at the median shows virtually no deviation from the average difference, remaining relatively constant at 52-53 percent over the entire period. In our case, the median is the value at which half of the population has a higher pension and the other half, a lower one. The calculation of the gender-specific pension gap at the median incorporates the pension values of men and women at the median instead of their average values.

12 All absolute differences are significantly different from zero.

only marginally over time. In Denmark, women received 19.6 percent less retirement income annually compared to men of the same age. The gender-specific difference in retirement income became slightly larger in Denmark between 2005/2006 and 2012.¹³

These results are comparable to those of earlier studies. The levels of the estimated gaps may differ for reasons related to data and sample selection – for example, earlier estimates of the gender pension gap in Germany ranged between 38 percent¹⁴ and 59 percent.¹⁵ But a range of publications report country-specific differences similarly: in Germany the gap is the widest and in Denmark, by far the narrowest.¹⁶

An explanation or decomposition of these differences in the gender pension gap by country exceeds the scope of this study. However, the above-mentioned country-specific differences in the gender pay gap, in the labor market participation of women, as well as other gender-specific inequalities surely play key roles.¹⁷ Pension system design is another possible reason for these differences. In Denmark, for example, a portion of the public pension, called the *Folkepension*, is not tied to the recipient's employment biography.¹⁸ Hence, differences between men's and women's labor market participation over the life cycle cannot feed directly into this portion of public pension payments.

No clear gender gap in self-assessed health

When asked about their general health status, elder women in Germany in 2006/2007 – the first period of observation – answered "average" or "poor" with a seven percentage points higher probability than men. This gap corresponds to a relative difference of around 16 percent.

In 2013, the difference between genders on this issue fell to three percentage points. However, the value is statistically uncertain and therefore, not significant. In Den-

13 In comparison to the average difference, the gap at the median decreases more obviously over time in France, falling to just under 40 percent in 2012. In Denmark the gap at the median is around ten percent in 2012, making it lower than the average gap.

14 See Francesca Bettio et al., "Gender gap in pensions, EU."

15 See Judith Flory, "The Gender Pension Gap."

16 See Ilze Burkevica et al., "Gender gap, note to Latvia"; Platon Tinios et al. "Men, women and pensions"; and Francesca Bettio et al., "Gender gap in pensions, EU."

17 The Gender Equality Index created by the European Institute for Gender Equality is intended to capture gender inequality as a whole. For 2010, for example, it reflects the country-specific pattern of the pension gaps calculated by us. France's value is six points higher, and on the scale from zero to 100, Denmark's score is almost 20 points higher than Germany's. See European Institute for Gender Equality, "Gender Equality Index 2010," Vilnius, 2017 (available online, accessed September 13, 2017).

18 See OECD, "Pensions at a Glance."

mark and France, we found no significant gender-specific differences in either 2006/2007 or 2013.¹⁹

Gender gaps in depressive symptoms and pensions follow similar pattern

There are substantial gender-specific differences in mental health in all three countries. Based on the EURO-D questionnaire, a higher proportion of women are classified as depressed (see Figure 3). In Germany, the difference for 2006/2007 is around 14 percentage points, and in 2013 it still amounts to 13 percentage points. In relative terms, women have a 110 percent (73 percent) higher probability of being classified as depressed compared to men in 2006/2007 (2013) (see Figure 4).

The gender-specific difference in depressive symptoms is considerably lower in Denmark. The share of women classified as depressed is only six percentage points (four percentage points) higher than that of men in 2006/2007 (2013).²⁰ In France the absolute difference is 20 percentage points in 2006/2007 and 17 percentage points in 2013, which is higher than in Germany at the respective times. Due to the higher rate of depression among men in France, the relative gender gap for depression there is slightly below the German value.

The country pattern in relative gender-specific differences in depressive symptoms is very similar to the pattern we found for the gender pension gap. The comparison between Germany and Denmark in particular reveals a considerably smaller gender gap in Denmark on both counts.

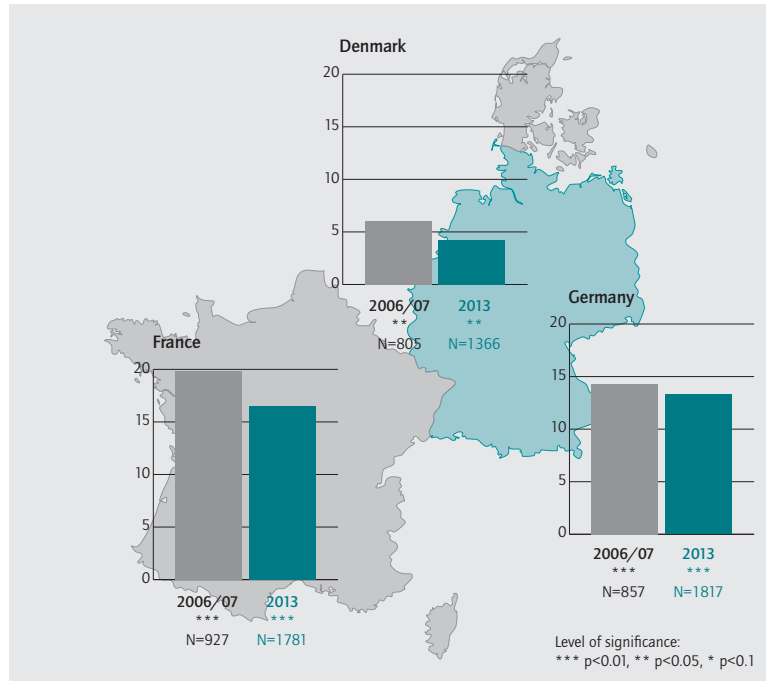
19 Earlier findings on the gender health gap as measured by self-assessed health are inconclusive. Some studies have found small gaps to the disadvantage of women; others have found none. See Anne-Laure Humbert et al., "Gender Equality Index. Measuring gender equality in the European Union 2005-2012," European Institute for Gender Equality, Vilnius, 2017 (available online); Anna Okszyan et al., "Cross-national comparison of sex differences in health and mortality in Denmark, Japan and the US," *European Journal of Epidemiology* 25 (2010): 471-480; and Eileen Crimmins, Jung Ki Kim, and Aida Solé-Auró, "Gender differences in health: results from SHARE, ELSA and HRS," *European Journal of Public Health* 21(1) (2010): 81-91.

20 This finding concurs with the current findings on the gender gap in mental health in the international literature. Large differences to the disadvantage of women across countries have been found, and Denmark is often found to have lower differences. See Michael Dewey and Martin Prince, "Mental health," In *Health, Ageing and Retirement in Europe*, edited by Axel Börsch-Supan et al., MEA Eigenverlag, Mannheim, 2005 (available online); George B. Ploubidis and Emily Grundy, "Later-life mental health in Europe: A country-level comparison," *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 64(5) (2009): 666-676; Eileen Crimmins et al., "Gender differences in health," and Anna Okszyan et al., "Cross-national comparison of sex differences."

Figure 3

Absolute gender gaps in depressive symptoms in Denmark, Germany, and France

Controlled for age, in percentage points



Note: Depressive symptoms based on EURO-D. The absolute differences refer to the respective shares of individuals with a EURO-D value of four or higher.

Sources: SHARE; authors' own calculations, weighted.

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The absolute gender gap in depressive symptoms is much lower in Denmark than in Germany and France.

Ambiguous pattern in further health outcomes

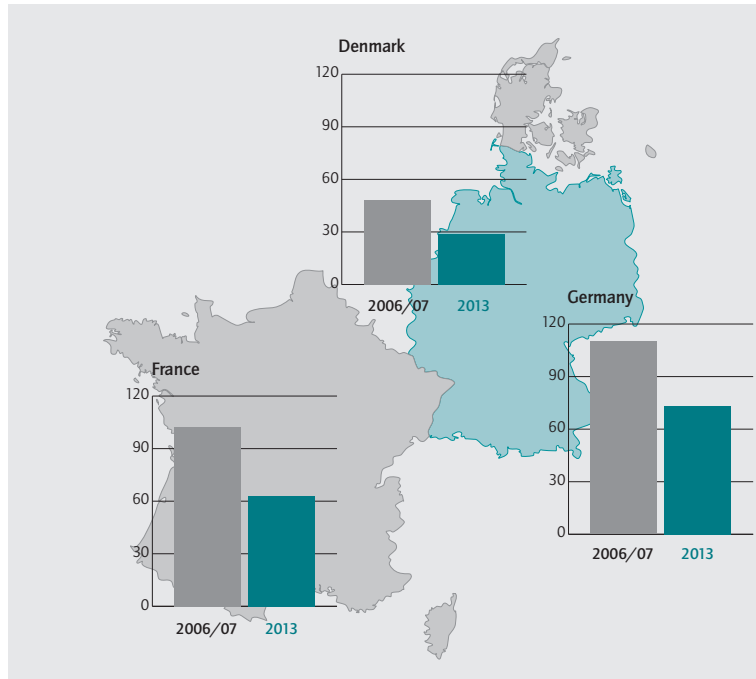
In addition to the self-assessed health status mentioned above, we analyzed other indicators for physical or general health for the three countries. Some of these indicators also show a significant gender health gap, although we cannot find a clear general pattern in country-specific differences. As an example, for the prevalence of chronic illnesses the relative gender gap is highest in Denmark. The indicator, "limitations in instrumental activities of daily living" is another example.²¹ Here, gender-specific

21 This indicator shows the number of limitations in instrumental activities of daily living. To derive it, respondents were asked about seven of these activities, for example preparing warm meals, making a telephone call, and taking medication. The answers were categorized into two groups for our analysis: "No limitations" and "One or more limitations."

Figure 4

Relative gender gaps in depressive symptoms in Denmark, Germany, and France

Controlled for age, in percent



Note: Depressive symptoms based on EURO-D. The relative differences refer to the respective shares of individuals with a EURO-D value of four or higher.

Sources: SHARE; authors' own calculations, weighted.

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Germany has the widest relative gender gap in depressive symptoms and Denmark the narrowest.

differences are at comparable levels in Germany and France, but lower in Denmark.

Conclusions

Our comparative analysis of the gender gap in retirement income and health in three countries shows that there is a gender pension gap in Germany, and that it is substantial in comparison to Denmark in particular. Parallel to the gender pension gap, there is a more pronounced gender difference in depressive symptoms of retirees in Germany compared to Denmark.

This study does not allow to draw causal conclusions regarding gender-specific inequality in retirement income and depressive symptoms. However, the findings of other scientific studies indicate a causal relationship between individual economic situations and health. Applied to our case of retirement income, this

Box

Background on data, pensions and health measurement

Data and sample selection

This report is based on data from the Survey of Health, Ageing and Retirement in Europe (SHARE).¹ SHARE is a recurring multi-disciplinary survey that collects data on health and economic conditions of the population over age 50 across countries.²

To establish comparability, we use data from Waves 2 and 5 of the survey,³ which were collected in 2006/2007 and 2013 respectively. The monetary indicators relate to the respective prior year; therefore, the findings for Wave 2 are based on 2005 and 2006 and those for Wave 5 on 2012.

The sample is restricted to people between ages 65 and 85 who receive a pension (see definition below). Respondents who received part of their income from employment during the relevant year are excluded.

The resulting sample⁴ is the basis for the analyses of the health and pension gaps. All analyses use cross-sectional

1 The SHARE data collection has been primarily funded by the European Commission through FP5 (QLK6-CT-2001-00360), FP6 (SHARE-I3: RII-CT-2006-062193, COMPARE: CIT5-CT-2005-028857, SHARELIFE: CIT4-CT-2006-028812) and FP7 (SHARE-PREP: N°211909, SHARE-LEAP: N°227822, SHARE M4: N°261982). Additional funding from the German Ministry of Education and Research, the Max Planck Society for the Advancement of Science, the U.S. National Institute on Aging (U01_AG09740-13S2, P01_AG005842, P01_AG08291, P30_AG12815, R21_AG025169, Y1-AG-4553-01, IAG_BSR06-11, OGHA_04-064, HHSN271201300071C) and from various national funding sources is gratefully acknowledged (see www.share-project.org).

2 For details on the SHARE methodology, see Axel Börsch-Supan et al., "Data Resource Profile: The Survey of Health, Ageing and Retirement in Europe (SHARE)," *International Journal of Epidemiology* (2013) and Frederic Malter and Axel Börsch-Supan, eds., "SHARE Wave 5: Innovations & Methodology," Munich Center for the Economics of Ageing (MEA) at the Max Planck Institute for Social Law and Social Policy, Munich, 2015 (available online).

3 Axel Börsch-Supan, "Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 2 and Wave 5, Release version 5.5.0," SHARE-ERIC (2016).

4 For the first period of observation (2005/2006 or 2006/2007), the unweighted sample post-selection contains 869 respondents in Germany, in France 960, and in Denmark 822. As a result of selecting respondents who did not receive income from employment in the respective year, three to 12 percent of observations per country were lost to the relevant sample. For 2012 or 2013, the sample contains 1,838 respondents in Germany, 1,799 in France, and 1,392 in Denmark. The selection process reduced the samples by four to 16 per-

weighting based on the calibrated weights provided by SHARE.⁵

Calculation of retirement income

We calculate the gender-specific gap in total pension. For this purpose, we calculate the annual net retirement income in euros for each observation. To make the results comparable across countries, we adjust income for purchasing power.

"Total pension" encompasses the three pillars of old age provision: public, private, and occupational pensions. For Germany, the first category is composed of public old age or civil service pensions, public early retirement pensions or early retirement benefits, disability pensions, or civil service pensions due to disability or sickness benefits. Denmark and France add a second public old age pension or public supplementary pension. Occupational pensions consist of occupational old age pensions from a last job, a second or third job, occupational early retirement benefits, and occupational disability pensions. Private pensions are regular life insurance payments and private annuity or private personal pension payments. The analysis only includes regular payments. Further payments and benefits from survivor pensions from a spouse or partner, a public war pension, unemployment, or long-term care insurance and alimony or lump payments are excluded. However, respondents who received such additional payments are nevertheless included in our analysis sample.

Measuring health

In order to analyze gender-specific differences in health, we rely on the self-assessment of general health often used in the literature, based on a scale of one (excellent) to five (poor). The scale is compressed into two categories: poor and good health. Poor health consists of respondents' self-assessments, "fair" (4) and "poor" (5), while good health ranges from "good" (3) to "excellent" (1). The gap analyzed here refers to the average proportion of men and women who reported that they were in poor health.

cent. In order to prevent the results from being biased by outliers, respondents who received a total annual pension of over one million euros were excluded from the analysis.

⁵ See Frederic Malter and Axel Börsch-Supan, eds., "SHARE Wave 5."

We use depression as an indicator of mental health. Our analysis is based on the EURO-D scale, which records 12 different depressive symptoms using yes-no questions.⁶ In line with the literature, we classify individuals as depressed from a EURO-D value of four or more.⁷ Based on that threshold, we divide respondents into a depressive and a non-depressive group and analyze the gender-specific difference in the proportions of those affected by depression.

Calculating the gender gap

We calculate the gender pension gap as the percentage difference in average retirement income between men and women. The gender health gap is calculated accordingly. Since age can have a considerable influence on a person's health status,⁸ we control for age. To ensure better comparability, we also control for the age structure when calculating the pension gap. In the calculation, the average absolute difference in pension between men and women, adjusted for age, is divided by the average retirement income of all men.

To compare the results for Germany with other countries, we look at the nationwide gender-specific difference in retirement income. Differentiation by region is not part of this study. However, other studies have examined the differences in gender pension gaps between western and eastern Germany.⁹

⁶ See Martin Prince et al., "Development of the EURO-D scale—a European Union initiative to compare symptoms of depression in 14 European centres," *The British Journal of Psychiatry* 174(4) (1999): 330-338; and George B. Ploubidis and Emily Grundy, "Later-life mental health in Europe."

⁷ See e.g. Ingo W. Kolodziej and Pilar García-Gómez, "The causal effects of retirement on mental health: Looking beyond the mean effects," *Ruhr Economic Papers* no. 668, (2017); and Michael Dewey and Martin Prince, "Mental health."

⁸ See Johan Mackenbach et al., "Physical health." In Axel Börsch-Supan, et al., *Health, ageing and retirement in Europe—first results from the survey of health, ageing and retirement in Europe*, MEA Eigenverlag, Mannheim, 2005, 89-94.

⁹ See Markus M. Grabka et al., "Der Gender Pension Gap verstärkt die Einkommensungleichheit von Männern und Frauen im Rentenalter" *DIW Wochenbericht* no. 5 (2017) (available online); and Annika Rasner, "Gender Pension Gap in Eastern and Western Germany," *DIW Economic Bulletin* no. 11 (2014): 42-50 (available online).

could mean that a more egalitarian income distribution in retirement could lead to a more egalitarian distribution of mental health.

Measures aimed at reducing gender-specific inequality during the economically active phase currently under discussion in Germany include taxing married couples as individuals²² and fully implementing the Remu-

22 See Stefan Bach, "Frauen erzielen im Durchschnitt nur so halb hohe Einkommen wie Männer," *DIW Wochenbericht* no. 35 (2014): 803-813 (available online).

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neration Transparency Act (*Entgelttransparenzgesetz*, EntgTranspG),²³ which is designed to promote more transparency regarding pay structures. Such policies could indeed contribute to closing the gender pension gap. Moreover, our findings suggest that such measures could potentially also reduce gender-specific differences in depressive symptoms in old age.

23 Federal Ministry for Family Affairs, Senior Citizens, Women and Youth, "Informationen zum Gesetz zur Förderung der Entgelttransparenz," Berlin, 2017 (available online).

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