Occupational inequalities in self-rated health and non-communicable disease in different regions of Europe

Abstract

Background

Socioeconomic inequalities in the prevalence of non-communicable diseases (NCDs) are evident across European populations. Several previous studies have addressed the question of whether occupational inequalities in health differ across European regions. It is uncertain however, the degree to which occupational inequalities in NCDs are similar or dissimilar across different European regions.

Methods

Using 2014/15 European Social Survey data from 20 countries, this paper examines occupational inequalities in poor self-rated health (SRH) and 14 self-reported NCDs separately for women and men, by European region: heart/circulatory problems, high blood pressure, back pain, arm/hand pain, foot/leg pain, allergies, breathing problems, stomach/digestion problems, skin conditions, diabetes, severe headaches, cancer, obesity and depression. Age-controlled adjusted risk ratios were calculated and separately compared a working class and intermediate occupational group with a salariat group.

Results

Working class Europeans appear to have the highest risk of reporting poor SRH and a number of NCDs. We find inequalities in some NCDS to be the largest in the Northern region, suggesting further evidence of a Nordic paradox. Like some previous work, we did not find larger inequalities in poor SRH in the Central/East region. However, we did find the largest inequalities in this region for some NCDs. Our results do not align completely with previous work which finds smaller health inequalities in Southern Europe.

Conclusions

This work provides a first look at occupational inequalities across a range of NCDs for European men and women by region. Future work is needed to identify the underlying determinants behind regional differences.

Introduction

Socioeconomic inequalities in the prevalence of non-communicable diseases (NCDs) are evident across European populations.[1,2] It is uncertain however, the degree to which inequalities in NCDs are similar or dissimilar across Europe. Differences across the regions of Europe might indicate that health inequalities are sensitive to different sociopolitical contexts and therefore may also point to possible underlying mechanisms.

Several previous studies have addressed the question of whether occupational inequalities in health differ across European regions.[3–7] A main starting point for much of this work is the finding that educational inequalities in mortality in the Eastern parts of Europe are larger than in the West[8], along with findings that poor SRH is more prevalent in Eastern versus Western Europe[9]. Both Toch et al.[4] and Eikemo et al.[3] however, do not find larger occupational inequalities in poor SRH in the East. It has also been suggested that there is a Northern European "public health puzzle" which has undermined the widely held expectation that health inequalities are smaller in the countries of Northern Europe (Scandinavia) - since policies in these countries have historically aimed at making different occupational groups less reliant on market success for a high standard of living.[10–12] In some studies, Southern Europe has, by contrast, emerged as the European region with the smallest occupational inequalities in health.[6,7] Finally, previous work suggests that Anglo-Saxon countries in the North-West of Europe, specifically Ireland and the U.K., will have some of the highest levels of health inequality since policies in these countries have historically minimized the decommodification effects of the welfare-state.[13]

Thus far, studies have not been able to comprehensively examine occupational inequalities in non-communicable diseases across European regions, due to a lack of

comparable data. This paper is therefore the first to do so, using a newly available data set from the 2014 European Social Survey which had a special module on health inequalities.[14] In this study, we examine occupational inequalities in reference to a diverse set of non-communicable diseases in Europe and aim to answer the following research question: What are the magnitude of occupational inequalities in SRH and non-communicable diseases in Europe and do they vary by European region?

Based on a new institutional theory of health inequalities we predict that there will be differences in the association between occupational groups and different health outcomes and that these associations will differ by region.[15] This theory posits that social policies combine and interact in ways which will impact differently on different health outcomes. Because social policies often vary systematically between groups of countries with similar sociopolitical histories, it is predicted these associations will differ by region.

Methods

This study is based on data from the seventh round of the European Social Survey (ESS), fielded in 2014/15. The ESS is comprised of more than 37,623 respondents in 20 European countries which can be organized into five regions: North (Denmark, Finland, Norway, and Sweden), North-West (Ireland and the U.K.), West (Austria, Belgium, France, Germany, Netherlands, and Switzerland), Central/East (the Czech Republic, Estonia, Hungary, Lithuania, Poland, and Slovenia) and South (Portugal and Spain). The organization of countries into these regions also follows broad welfare state characterizations [10,16]. The average response level for all countries was 51.6%, ranging from 31.4% in Germany to 68.9% in Lithuania. Data was collected via face-to-face interviews with individuals aged 15 and over, living in private households. In line with several studies on earlier ESS rounds, we included only respondents aged 25-75 in this study.[17] We also excluded retirees. Estonia and the Czech Republic were not

included in the analyses due to missing data on NCDs. After excluding individuals with missing data on study variables, a total of 18,888 participants were available for our analysis.

Non-Communicable Diseases

Data were analysed for self-rated health and 14 self-reported NCDs: heart/circulatory problems, high blood pressure, back pain, arm/hand pain, foot/leg pain, allergies, breathing problems, stomach/digestion problems, skin conditions, diabetes, severe headaches, cancer, obesity and depression. SRH was assessed using the following question: 'How is your health in general?'. Eligible responses were 'very good', 'good', 'fair', 'bad', and 'very bad'. Respondents were characterized as having poor SRH if they indicated, 'fair', 'bad', or 'very bad'. Data was collected on the first 11 of the 14 NCDs by providing participants with a list of conditions and asking them to indicate which they had experienced in the previous 12 months. Data on cancer was collected by asking respondents whether they have or have ever had cancer affecting any part of the body. For obesity, self-reported height and weight were converted to BMI. Obesity was categorized as a BMI greater than 30. A depression scale was created by using an eight-item version of the Center for Epidemiological Studies Depression Scale (CES-D scale).[18] This scale has been shown to be valid for cross-national research.[19] For this paper we used a dichotomized measure of depression, as outlined in Huijts et al.[20]

Occupational class

Occupational class was defined according to the European Socioeconomic Classification (EseC) scheme which is a widely used development of the Erikson–Goldthorpe–Portocarero classification[21]. The ESeC classifies people according to their positions within labour markets and with special attention to their employment relations. Assignment to EseC occupational class categories was undertaken using tools developed by Ganzeboom and Treiman[22]. In order to improve sample coverage, those who are not currently in paid employment are allocated to

an ESeC class on the basis of their last main paid job. To avoid small numbers, we used the scheme's established three class model to categorize respondents as either salariat, intermediate or working class.[21]

Analyses

For both a pooled European analysis and region-specific analyses, age-controlled adjusted risk ratios (ARR) were calculated from predicted probabilities generated by means of binary logistic regression.[23] We chose to calculate ARRs rather than odds ratios, as the latter are likely to be artificially high for non-rare conditions.[24] Moreover, ARRs are calculated from predicted probabilities, which are a preferred estimation method for cross-national comparisons of health inequalities. [25] This is because they do not rely on the assumption that error variance across countries is the same. We controlled for age with reference to three age groups: 25-45, 46-64, and 65-75. Age-stratified analyses were not possible due to low sample sizes, however, we report on some general patterns found in age-stratified sensitivity analyses in the discussion section. We also included country dummies in our models and stratified our analyses by gender. Data were weighted using population weights which are reported in the ESS and combined with a post-stratification weight which uses information on age-group, gender, education, and region to reduce the sampling error and potential non-response bias of the survey. We accounted for the nesting of individuals within countries by estimating clustered standard errors. STATA 14.1 was used for all analyses. Country-specific prevalence rates are presented in a supplementary file.

Our analyses separately compared the working class and intermediate occupational group with the salariat. A social gradient in health was observed when significant differences were observed between both lower occupational groups and the salariat group. When a

difference was observed between only one of the lower occupational groups (i.e. either the working class or intermediate group) and the salariat, we deemed this a socioeconomic gap.

Results

The distribution of respondents across the study variables is presented in Table 1 by gender and region. It shows that the populations in the different regions have roughly similar occupational class distributions, but that the percentage of working class is greater in the Central/Eastern, Southern and (to a lesser degree) North-West regions.

Table 2 summarizes the European pooled ARRs for poor SRH and the different NCDs. Social gradients were observed among both men and women for poor SRH and depression. Additional social gradients were observed among women for breathing problems, hand/arm pain, foot/leg pain and obesity. An inverse social gradient (with a step-wise higher prevalence among the intermediate and salariat group) was found among men for allergy. The CIs of the working class and intermediate occupational groups overlapped for all of these conditions except for poor SRH among women. Additional socioeconomic gaps were observed among working class women for high blood pressure and among both lower occupational class groups (but not in a step-wise manner) for heart/circulation problems. Additional socioeconomic gaps were observed among men in the intermediate class group for foot/leg pain and among both lower occupational groups for hand/arm pain (but not in a step-wise manner). Lower risk than that of the salariat was found among women in the working class group for allergies and skin problems. Lower risk than that of the salariat was found among men in the working class group for stomach/digestion problems. Neither social gradients nor socioeconomic gaps were found for back/neck pain, severe headaches, diabetes nor cancer.

Large ARRs (> 1.5) were found for poor SRH among working class women (1.59 CI 1.46-1.73) and men (1.54 CI 1.38-1.72), obesity among working class women (1.63 CI 1.36-2.04), and

depression among women and men in both the intermediate and working class groups (respectively, 1.51 (CI 1.20-1.90) and 1.99 (CI 1.81-2.18) among women and 1.63 (CI 1.20-2.22) and 2.28 (CI 1.72-3.02) among men).

Tables 3 and 4 and Figures 1-30 (in a second supplementary file) indicate the magnitude of occupational inequalities in NCDs and how they vary by European region. Patterns of social gradients and socioeconomic gaps found at the pooled European level were not typically found to be replicated across all regions. For example, while no inequalities were found for back/neck pain, severe headaches, diabetes nor cancer at the pooled European level, we found inequalities in these conditions among women and men in some of the European regions.

Regional patterns in the magnitude of inequalities were found to vary by health outcome. Northern countries were found to have the largest inequalities among women in the intermediate class for poor SRH, among the working class for hand/arm pain, and among both lower occupational classes for depression. There was however, some degree of CI overlap with other regions in all of these cases. The most striking case was found for depression where the ARR for working class women in the North was found to be 2.43 (CI 1.92-3.07), compared with ARRs of 1.80 (CI 1.40-2.31) in the Central/East, 1.84 (CI 1.68-2.02) in the Northwest, 1.95 (CI 1.72-2.22) in the West, and 2.27 (CI 2.13-2.43) in the South. This pattern of the North having the largest inequalities among women was not found across the other NCDs.

Among men, there was a more consistent pattern of larger inequalities in the North. Inequalities among men were found to be the largest in the North among both lower occupational classes for poor SRH, heart/circulation problems, high blood pressure and breathing problems. Inequalities among men were also found to be the largest in the North among the working class for hand/arm pain. Here the most striking case was found for breathing problems where ARRs among the two lower occupational groups in the North were

found to be 1.98 (CI 1.48-2.65) and 1.91 (CI 1.35-2.69). No inequalities by contrast, were found for breathing problems in the West, Central/East, nor Southern regions. In the North-West, a lower risk of breathing problems was found among the working class group, with an ARR of 0.94 (CI 0.91-0.97).

For some conditions, inequalities were found to be the largest in the Central/Eastern region (with some degree of overlapping CIs). This was found to be the case among working class women for high blood pressure, among intermediate class women for foot/leg pain and among women in both occupational classes for heart/circulation problems, breathing problems and diabetes. Among men, the Central/Eastern region was found to have the highest inequalities only for depression among the intermediate occupational group.

The North-West region was found to have the largest inequalities among women for a similar number of conditions to the Central/Eastern region. Inequalities were found to be the largest among North-Western women in the intermediate occupational group for allergies, back/neck pain and hand/arm pain. Inequalities were found to be the largest in this region among working class women for poor SRH, back/neck pain and foot/leg pain. Among men, the North-West region was found to have the largest inequalities in a number of conditions including hand/arm pain, foot/leg pain and obesity in both occupational groups, and severe headaches in the intermediate occupational group. Only the Northern region was found to have the largest inequalities in a greater number of conditions than the North-West region among men.

We found very few inequalities to be the smallest in the South. Among women no inequalities were found to be the smallest in this region. Among men, inequalities were found to be the smallest in the Southern region in terms of poor SRH. There were a number of

conditions however, for which we did not find inequalities among women nor men in neither the Southern nor some of the other regions.

On the other hand, we found some of the largest inequalities in the Southern region. This was true among intermediate class women for high blood pressure and obesity. Among working class women, the largest inequalities for severe headaches were also found in the Southern region. Among men, the largest inequalities for cancer were found in the Southern region, among both lower occupational groups. The largest inequalities were also found in this region among the working class for severe headaches and depression (albeit with some overlapping CIs). In terms of depression, the differences in magnitude were notably large, however there was a fair amount of overlapping CIs. Among working class men in the Southern region for example, the ARR for depression was found to be 5.77 (CI 1.73-19.22). This can be compared with an ARR in the West of 1.82 (CI 1.36-2.44), in the North-West of 2.15 (CI 2.09-2.22), in the North of 2.45 (1.11-5.40) and in the Central/East of 2.72 (CI 2.37-3.13).

Discussion

The aim of this study was to examine the magnitude of occupational inequalities in poor SRH and NCDs in Europe and whether they vary by European region. In line with previous work, we find that working class European women and men appear to have the highest risk of reporting poor SRH.[3,4] To our knowledge though, this is the first study to also find this pattern across a diverse set of NCDs.

Our results also suggest further evidence of a Nordic paradox, especially among men. Among men in both lower occupational groups, inequalities were larger in Northern Europe for poor SRH, heart/circulation problems, high blood pressure and breathing problems. Among working class men, inequalities were also found to be the greatest in the Northern region for hand/arm pain. Among women in both lower occupational groups, inequalities were larger in

Northern Europe than in any other region for depression. Inequalities were also larger among working class and intermediate class women in Northern Europe for hand/arm pain and poor SRH, respectively.

Like some previous work[3,4] we did not find larger occupational inequalities in poor SRH in the Central/East region. However, we did find the largest inequalities in Central/Eastern Europe for some NCDs. Among women this was true of high blood pressure (among the working class), foot/leg pain (among the intermediate occupational group), and heart/circulation problems, breathing problems and diabetes (among both lower occupational groups). Among men, this was true only for depression among the intermediate occupational group.

Our results do not align completely with previous work which finds smaller health inequalities in the South of Europe[6,7]. We do find some cases where inequalities are smaller in the Southern region and also cases where inequalities are not found in the Southern region as they are in other regions. However, some of the largest inequalities were also found in the South, specifically among women in the intermediate class for high blood pressure and obesity and among women in the working class for severe headaches. We also found the largest inequalities for depression and severe headaches among working class men in the Southern region, and for cancer among men in both lower occupational classes.

No prior study of this research area has compared occupational inequalities in relation to such a broad array of health outcomes across different regions of Europe. There are however, a number of limitations to this work which should be considered. First, in light of the study's cross-sectional design, causal interpretations cannot be drawn. Second, we included a large age range of respondents. While age-stratified models would have been preferable, this option was precluded by small sample sizes. A sensitivity analysis which stratified respondents

by age at the pooled European level suggests that our results somewhat underestimate the ARRs for women in the 25-45 age group and over-estimate them in the older cohorts. Among men, by contrast, ARRs are likely underestimated for the 46-64 age group and over-estimated in the youngest and oldest age group. These patterns however, will likely differ by region. Third, our measurement of occupational class was based on an individual's present job (for those who were employed at the time of the survey) and on an individual's past job (for those who were not currently employed at the time of the survey). At the same time, our health outcomes can be characterized by different etiologic periods and were based both on respondent's current and past health experiences. While this makes the interpretation of our results difficult, we believe our findings offer a starting point for future investigations into institutional mechanisms.[15] Fourth, some of the regions are smaller and more homogenous than the others. Sample sizes were particularly small for the Southern region and results for this region in particular should be interpreted with caution. However, this is a general challenge faced in pan-European comparisons and also relates in part to the fact that the ESS round 7 is limited in the countries that were surveyed, particularly in the South. While one alternative would have been to provide individual country analyses, our aim was a comparison of inequalities over a large number of health outcomes, rather than a detailed country comparison of a few outcomes. Another limitation of this work is that it relies on self-reported data, rather than clinical diagnosis. While self-reports may depend on characteristics of respondents other than the clinical presence of a condition, substantial accuracy has been found between physician reported medical histories and self-reports for many conditions.[1] Finally, although the ESS maintains a high standard of data collection, the survey is still prone to differences in response rates and cross-cultural quality of questions. For a further discussion on the strengths and weaknesses of the ESS, see Eikemo et al..[18]

Overall, this work provides a first look at occupational inequalities across a range of NCDs for European men and women by region, using a comparable data set. Future work should continue to identify regional patterns in European health inequalities and also seek to identify the underlying determinants behind these patterns.

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Table 1. Sample Characteristics

	North		West		Central/East		South		North-West	
Occupational class	N	%	N	%	N	%	N	%	N	%
Females										
Salariat	947	48.4	1,428	39.7	593	32.0	250	26.6	489	34.9
Intermediate	468	23.9	1,035	28.8	436	23.5	249	26.5	378	27.0
Working class	542	27.7	1,137	31.6	827	44.6	441	46.9	533	38.1
Males										
Salariat	906	44.5	1,402	40.4	401	25.9	274	29.6	383	33.3
Intermediate	538	26.5	1,068	30.7	319	20.6	280	30.2	355	30.9
Working class	590	29.0	1,004	23.9	830	53.6	373	40.2	412	35.8
Age										
Females										
25-45	955	48.8	1,784	49.6	965	52.0	458	48.7	740	52.9
46-64	937	47.9	1,693	47.0	838	45.2	427	45.4	582	41.6
65-75	65	3.3	123	3.4	53	2.9	55	5.9	78	5.6
Males										
25-45	979	48.1	1,656	47.7	781	50.4	485	52.3	560	48.7
46-64	969	47.6	1,721	49.5	725	46.8	409	44.1	527	45.8
65-75	86	4.2	97	2.8	44	2.8	33	3.6	63	5.5
Less than good health										
Females	420	21.5	974	27.1	654	35.2	399	42.5	284	20.3
Males	369	18.1	833	24.0	457	29.5	290	31.3	220	19.3
Heart or circulation problems										
Females	81	4.1	251	7.0	216	11.6	76	8.1	56	4.0
Males	110	5.4	218	6.3	112	7.2	47	5.1	53	4.6
High blood pressure										
Females	239	12.2	465	12.9	281	15.1	125	13.3	143	10.2
Males	302	14.9	479	13.8	225	14.5	119	12.8	147	12.8
Breathing problems										
Females	203	10.4	314	8.7	70	3.8	67	7.1	145	10.4
Males	159	7.8	259	7.5	49	3.2	52	5.6	99	8.6
Allergies										
Females	413	21.1	570	15.8	153	8.2	134	14.3	134	9.6
Males	350	17.2	404	11.6	85	5.5	114	12.3	79	6.9
Skin problems										
Females	271	13.9	389	10.8	90	4.9	100	10.6	143	10.2
Males	230	11.3	313	9.0	33	2.1	54	5.8	88	7.7
Back/neck pain										
Females	1049	53.6	1845	51.3	560	30.2	472	50.2	456	32.6
Males	945	46.5	1523	43.8	419	27.0	367	39.6	339	29.5
Hand/arm pain										
Females	523	26.7	845	23.5	259	14.0	314	33.4	249	17.8
Males	480	23.6	704	20.3	213	13.7	196	21.1	180	15.7

Foot/leg pain										
Females	530	27.1	796	22.1	273	14.7	291	31.0	276	19.7
Males	511	25.1	770	22.2	204	13.2	202	21.8	222	19.3
Severe headaches										
Females	392	20.0	846	23.5	299	16.1	250	26.6	188	13.4
Males	183	9.0	445	12.8	108	7.0	105	11.3	68	5.9
Stomach /digestion										
Females	465	23.8	735	20.4	263	14.2	167	17.8	221	15.8
Males	318	15.6	493	14.2	145	9.4	123	13.3	148	12.9
Diabetes										
Females	57	2.9	90	2.5	52	2.8	38	4.0	37	2.6
Males	79	3.9	132	3.8	44	2.8	39	4.2	43	3.7
Obesity										
Females	276	14.1	447	12.4	277	14.9	148	15.7	212	15.1
Males	319	15.7	499	14.4	252	16.3	161	17.4	194	16.9
Cancer										
Females	168	8.6	336	9.3	237	12.8	69	7.3	135	9.6
Males	102	5.0	223	6.4	146	9.4	35	3.8	75	6.5
Depression										
Females	159	8.1	443	12.3	306	16.5	219	23.3	187	13.4
Males	119	5.9	266	7.7	188	12.1	107	11.5	110	9.6