The Europain Epidemic: pain prevalence and socioeconomic inequalities in pain across 19 European countries

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Significance

This is the first pan-European study that has explored socioeconomic inequalities in pain. Across Europe, pain is more prevalent in people of lower socioeconomic position; these pain inequalities were most significant for hand/arm pain, and least significant for back/neck pain.

Abstract

Background:

Using data from the European Social Survey (ESS) 2014, this study presents an update of pain prevalence amongst men and women across Europe and undertakes the first analysis of socioeconomic inequalities in pain.

Methods:

Data from the ESS 2014 survey were analysed for three pain variables: back/neck pain (n=11,032), arm/hand pain (n=5,954), and foot/leg pain (n=6,314). Education was used as the indicator of socio-economic status (SES). Age adjusted risk differences (ARD) and age adjusted risk ratios (ARR) were calculated from predicted probabilities generated by means of binary logistic regression. These analyses compared the lower education group with the higher education group (the socioeconomic gap), and the medium education group with the higher education group (the gradient).

Results:

High prevalence rates were reported for all three types of pain across European countries. At a pan-European level, back/neck pain was the most prevalent with 40% of survey participants experiencing pain; then hand/arm pain at 22%, and then foot/leg pain at 21%. There was considerable cross-national variation in pain across European counties, as well as are significant socio-economic inequalities in the prevalence of pain – with social gradients or socio-economic gaps evident for both men and women; socio-economic inequalities were most pronounced for hand/arm pain, and least pronounced for back/neck pain. The magnitudes of the socioeconomic pain inequalities differed between countries, but were generally higher for women.

Conclusions:

Future strategies to reduce the burden of pain should acknowledge and consider the associated socioeconomic inequalities of pain to ensure the 'pain gap' does not widen.

Keywords: Pain, Health inequalities, European Social Survey (ESS), Non-Communicable Disease, Europe, Gender

Introduction

Chronic pain is a global problem which has a significant impact on patients and their families (through disability, lost work, and social isolation), employers, health services, and the wider economy (Gureje *et al*., 1998; McQuay, 2008; Phillips, 2009). Indeed, recent estimates suggest that, in Denmark, for example, one million working days are lost each year due to chronic pain, while in the UK, it is suggested that back pain alone costs the economy more than 5 billion per year; similar findings have also been reported throughout Europe (Eriksen et al., 2006; Maniadakis & Gray, 2000). Given these findings, it is no surprise that chronic pain is viewed as a significant public health priority (Goldberg & McGee, 2011). Furthermore, the World Health Organisation (WHO) have recently reclassified – through the International Classification of Diseases (ICD) – chronic pain as a disease in the hope that governments take a new interest in how chronic pain is identified, assessed, and managed (WHO, 2018).

The aetiology of chronic pain is complex, and is influenced by a range of biochemical, psychosocial and behavioural factors (Turk & Okifuji, 2002; Cohen & Mao, 2014). Studies have shown that the prevalence of chronic pain is also associated with a range of socio-economic and socio-demographic factors: increasing age (Rustøen *et al*., 2005), female sex (Blyth *et al*., 2001; Fayaz *et al*., 2016), and lower educational status (Hagen *et al*., 2002; Dorner *et al*., 2018; Azevedo *et al*., 2013) are positively associated with the prevalence of chronic pain. It is this complexity that makes chronic pain challenging to manage effectively, with many treatment strategies relying on the use of opioid

analgesics, although there are very few studies to support their long-term effectiveness (Jensen *et al*., 2006; Stannard *et al*., 2011).

In the US, the increased reliance on opioid analgesics has given rise to an 'opioid epidemic', where there has been increasing levels of opioid misuse and related overdoses (Calcaterra *et al*., 2013). In view of this well-reported opioid crisis, there is an abundance of literature exploring the prevalence of chronic pain in the US (e.g. by Johannes *et al*., 2010), although the prevalence of pain in other countries is less documented. In terms of future planning though, it is important to establish the burden of pain so that appropriate resources are provided for health and social services. To date, Breivik *et al* (2006) provide the most comprehensive indication of the prevalence of chronic pain in Europe – but this study uses data that is from the early 2000's, and does not consider socio-economic inequalities in pain prevalence. Although there are individual country studies of socioeconomic inequalities of pain (see, for example, the work by Hagen *et al*), little is known about differences in socio-economic inequalities in pain across different European countries. What is lacking is a comprehensive and up-to-date study of the prevalence of pain and socio-economic inequalities in pain across Europe: both at a wider European-level and at an individual country-level. The objective of this study was, therefore, to provide the first pan-European analysis of the prevalence of pain and socio-economic inequalities in pain amongst both men and women.

Methods

Data

This study is based on cross-sectional data from the 2014 round of the European Social Survey (ESS) which contained the rotating module 'Social inequalities in health and their determinants' – the first comparable, pan-European survey of non-communicable diseases (NCDs) and their determinants in

Europe (Eikemo *et al*., 2017). Pain data was available for 19 European countries: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Lithuania, Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland and the UK. Specifically, the survey collected data on three pain variables: back/neck pain, arm/hand pain, and foot/leg pain; other types of pain variables were not included in the survey. Data was collected via face-to-face interviews with individuals aged 15 and over living in private households. The average response level for all countries was 51.6%, ranging from 31.4% in Germany to 68.9% in Lithuania (for more details: see: https://www.europeansocialsurvey.org/docs/round7/survey/ESS7_data_documentation_report_e03_2.pdf. In line with previous studies using earlier ESS rounds, we included only respondents aged 25-74 in this study (Huijts *et al*., 2017). We restricted our analyses to this target population since inclusion of all ages would have yielded selectivity problems: people younger than 25 have often not yet completed their education and people over the age of 75 represent a very selective group of relatively healthy individuals (Huijts *et al*., 2010). After excluding individuals with missing data on study variables, a total of 27,552 respondents were used for our pooled analysis.

Data were analysed for the three pain variables included in the ESS: back/neck pain (n=11,032), arm/hand pain (n=5,954), and foot/leg pain (n=6,314). Data was collected by providing participants with a list of conditions and asking them to indicate which they had experienced in the last 12 months: muscular or joint pain in the back or neck; muscular or joint pain in the hand or arm; muscular or joint pain in the foot or leg. More information on the data collection, including the full questionnaire that was used, can be found on the ESS website: http://www.europeansocialsurvey.org/. See e-supplement 1 for further information on the analysed sample.

Education was used as the indicator of socio-economic status (SES). Seven categories were used by the ESS to measure respondents' highest educational level, reflecting the International Standard Classification of Education (ISCED) (ISCED, 2011). In keeping with other comparative epidemiological studies (Huijts *et al*., 2010), a low (ISCED I and II), medium (ISCED II, III and IV) and high (ISCED V) education group were constructed from these categories.

Analysis

Data were age-standardised by weighting up or down the unstandardized (crude) prevalence rates for five-year age groups in each country in accordance with the European Standard Population (ESP) of 2013 (Eurostat, 2013). This is a revision of the commonly used 1976 ESP, which accounts for the fact that the European population is ageing (ISD Scotland, 2014). Data were weighted using post-stratification population weights for the pooled analysis and design weights for the country specific analysis. These weights are reported in the ESS to correct for different population sizes between countries and use information on age-group, gender, education, and region to reduce the sampling error and potential non-response bias of the survey (ESS, 2014). In the pooled analysis, we further accounted for the nesting of individuals within countries by estimating clustered standard errors. We present pooled estimates (percentages) for the combined cross-national sample as well as country-specific results. For both a pooled European analysis and country-specific analyses of inequalities in pain by SES, age adjusted risk differences (ARD) and age adjusted risk ratios (ARR) were calculated from predicted probabilities generated by means of binary logistic regression (Norton *et al*., 2013). These analyses separately compared (i) the lower education group with the higher education group (the socioeconomic gap) and (ii) the medium education group with the higher education group (the gradient). ARRs were used in preference to odds ratios, as the latter are likely to be artificially high for more common NCDs (Tajeu *et al*., 2012). Moreover, ARRs are calculated from predicted probabilities, which are a preferred estimation method for cross-national comparisons of health

inequalities (Beckfield *et al*., 2013). This is because they do not rely on the assumption that error variance across countries is the same. A social gradient in health was observed when significant differences were observed between either the low or the medium education groups compared to the high education group. When a difference was only observed between the low education group and the high education group, we deemed this a socio-economic gap (Bambra, 2016). Stata v14.1 was used for all analyses.

Sensitivity analysis

Of the 29,589 observations in our data, 154 (0.5%) had missing covariate and 1883 (6.4%) had missing outcome data. All the analyses presented in this work were based on maximum likelihood estimation, which are valid and unbiased under the assumption of missing at random (Molenberghs & Kenward, 2007). Due to the low proportion of missing covariate data, sensitivity analyses were only performed for the missing outcome data. Dropout models using a generalised linear mixed effect model were fitted on each of the pain outcomes. The results showed significant association between probability of missing with age and education status. Older participants were also more likely to have missing outcome data, as were participants with low educational status, compared to those with higher educational status. The dropout model indicated that the missing mechanism in the outcome data was not likely to be missing completely at random. To sensitize the assumption of missing not at random, we compared the results from direct likelihood estimation and multiple imputation. Both results should be consistent and similar if the missing mechanism is missing at random. A substantial difference between the two sets of results may indicate missing not at random, suggesting that the results in the paper should be interpreted with caution. As shown in e-supplement 2, the direct likelihood estimation and multiple imputation results are similar and comparable. We therefore conclude that the results in presented in the paper are unbiased with respect to missing data and the assumption of missing at random appears plausible.

Ethical approval

Ethical approval of this work was not required, as the study used non-patient identifiable secondary data; patients were not actively involved in this research.

Results

Prevalence of Pain

Countries were grouped by geographical regions to highlight the regional clustering of estimates that we find for several of the items. The overall prevalence estimates for back/neck pain, arm/hand pain, and foot/leg pain, for each country, and Europe as a whole is summarized in Table 1, e-supplement 3, and visually in Figure 1. Overall, all three pain conditions affect substantial percentages of the respondents in most countries – an epidemic, yet there are also considerable differences across countries and by gender.

At the pan-European level, around 40% of all respondents reported back/neck pain, 22% arm/hand pain, and 21% foot/leg pain. These prevalence rates were generally lower in Central/Eastern Europe (with the exception of Slovenia), compared to the rest of Europe. The prevalence of back/neck pain was highest in Germany (54.05%) and lowest in Hungary (16.08%); hand/arm pain was highest in Finland (31.67%) and lowest in Lithuania (13.00%); foot/leg pain was highest in Portugal (31.84%) and lowest in Lithuania (10.54%). When looking at levels of education, it is clear that, at the pan-European level, people with lower education have higher levels of hand/arm pain, foot/leg pain, but not back/neck pain (Table 2, and e-supplement 4).

Socio-economic Inequalities in Pain

The ARDs and ARRs for prevalence by SES for back/neck pain, hand/arm pain, and foot/leg pain, are summarized for men and women together (Table 3, and visually in Figures 2 and 3), and separately (e-supplements 5, 6, and 7). At the pan-European level, when examining all respondents, a social gradient, in absolute terms (ARD) and in relative terms (ARR), was observed for hand/arm pain – with both the medium education group (ARD 5% [95% CI 4, 6%], and ARR 1.28 [95% CI 1.23, 1.34]), and the low education group (ARD 11% [95% CI 9, 14%], and ARR 1.61 [95% CI 1.49, 1.75]) exhibiting significantly higher prevalence than the high education group (reference). This gradient was also observed for foot/leg pain: the medium education group (ARD 2% [95% CI 1, 4%], and ARR 1.11 [95% CI 1.06, 1.17]), and the low education group (ARD 5% [95% CI 3, 8%], and ARR 1.24 [95% CI 1.12, 1.37]). There was no reported social gradient though at the pan-European level for all respondents with respect to back/neck pain.

The majority of countries exhibited significant inequalities in pain, with social gradients present for back pain in 3 countries (Belgium, Germany, and Lithuania), arm/hand pain in 8 countries (Denmark, Finland, Sweden, Austria, Germany, France, UK, Lithuania), and foot/leg pain in 2 countries (Germany, Lithuania). A socio-economic pain gap – between low and high education status – was present in 3 countries (Belgium, Germany, Lithuana) for back pain, in 16 countries for arm/hand pain (Denmark, Finland, Norway, Sweden, Austria, Belgium, Switzerland, Germany, France, UK, Poland, Slovenia, Lithuania, Czech Republic, Hungary, and Portugal), and in 7 countries for foot/leg pain (Denmark, Germany, Slovenia, Lithuania, Czech Republic, Hungary and Portugal).

When analysing men and women separately at the pan-European level, a social gradient was observed in both men and women for hand/arm pain, and in women for foot/leg pain: for arm/hand pain in men, the medium education group (ARD 4% [95% CI 2, 6%], and ARR 1.21 [95% CI 1.10, 1.33]), and the low education group (ARD 8% [95% CI 3%, 10%], and ARR 1.45 [CI 95% 1.22, 1.72]), exhibited significantly higher prevalence than the high education group (reference). For hand/arm pain in women, the medium education group (ARD 6% [95% CI 5, 7%], and ARR 1.33 [95% CI 1.26, 1.40]), and the low education group (ARD 14% [95% CI 11, 16%], and ARR 1.72 [95% CI 1.56, 1.89]), exhibited significantly higher prevalence than the high education group. For foot/leg pain in women, the medium education group (ARD 4% [95% CI 2, 5%], and ARR 1.17 [95% CI 1.11, 1.23]), and the low education group (ARD 8% [95% CI 5, 10%], and ARR 1.36 [95% CI 1.24, 1.49]), exhibited significantly higher prevalence than the high education group (reference). There was, however, no social gradient observed at the pan-European level for men or women with respect to back pain.

At the pan-European level, socio-economic inequalities were higher for women than men for hand/arm pain and foot/leg pain. In terms of individual country level analysis, the socioeconomic pain gap was highest for foot/leg pain in women in Portugal (ARD 23% [95% CI 12, 35%], and ARR 2.24 [95% CI 1.36, 3.69]; for hand/arm pain in women in Finland (ARD 33% [95% CI 19, 47%], and ARR 2.28 [95% CI 1.93, 4.13]); and, for back/neck pain in men in Portugal (ARD 19% [95% CI 3, 36%], and ARR 1.58 [95% CI 1.00, 2.50].

Discussion

In this paper, we have used data from the 7th wave of the European Social Survey (2014) to derive the first comprehensive overview of pain in 19 countries across Europe. We have identified several key findings that may be important to practitioners and policy makers: (1) high prevalence rates for all three types of pain were reported across European countries, and for both men and women; at a

pan-European level, back pain was the most prevalent with 40% of survey participants experiencing pain within 12 months; then hand/arm pain at 22%, and then foot/leg pain at 21%; (2) there is considerable cross-national variation in pain across European counties; this finding underlines the importance of using comparative data and conducting comparative research on pain, as generalising findings from one European country to another could be problematic. Finally, (3) our analysis further indicates that there are significant socio-economic inequalities in the prevalence of pain – with social gradients or socio-economic gaps evident for both men and women across Europe; socio-economic inequalities were most pronounced for hand/arm pain, and least pronounced for back/neck pain. In addition, the magnitudes of the socio-economic pain inequalities differed between countries, but were generally higher for women.

Our findings correspond with findings from previous studies exploring the prevalence of pain. For example, Breivik *et al* (2006), who published the most extensive pain survey at a pan-European level, showed that back pain is the most common site of chronic pain; unlike our survey, neck pain was treated separately in this survey, and was reported in 8% of respondents. Breivik *et al* (2006) also reported that pain was more common in women than in men (56% versus 44%); this finding is in agreement with our study where we also report that pain is more common in women than in men. In terms of socioeconomic inequalities in pain, previous smaller, single country-based studies have shown that pain is more prevalent in people of lower socioeconomic status; for example, Grossschädl *et al* (2016), who examined the prevalence of back pain among adult Austrians according to educational status, showed that the age-standardised prevalence of back pain was highest among adults with a low education level, although when the results were stratified according to sex, the inequality gradient (from low, middle and highly educated) was only evident for men. Importantly, the authors from this paper concluded that education level is an important social indicator for back pain, and the association between back pain and education level is more relevant

for men than women. Similarly, Hagan *et al* (2005), who evaluated the relationship between socioeconomic status and chronic musculoskeletal complaints in Norway, showed that when defining socioeconomic status by education level, type of occupation, or income, low SES was associated with increased prevalence of chronic musculoskeletal complaints. Previous work from England also showed that chronic pain prevalence, pain intensity – and subsequent opioid utilisation – is associated with education status, with people of lower education more likely to have pain; there were also significant inequalities in pain prevalence *within* England – with evidence of a pain divide between the North and South (Todd *et al*., 2018). Reasons for lower socioeconomic inequalities in back pain in our study, may be partly explained due to the higher population prevalence: there is some evidence that the magnitude of relative inequalities in mortality and morbidity are negatively correlated with underlying morbidity prevalence and mortality rates (Eikemo *et al*., 2009).

The finding of socioeconomic inequalities in pain across Europe is also in keeping with other non-communicable diseases, such as some cancers, obesity and cardiovascular disease (Mackenbach *et al*., 2008). It is possible that the prevalence of pain in European countries may well reflect the underlying presence of non-communicable diseases across Europe (McNamara *et al*., 2017a). Further, the socio-economic inequalities in pain detected by this study follow a similar pattern to inequalities in NCDs more generally, and may also reflect underpinning conditions linked to pain. For example, diabetes can cause peripheral neuropathy, while obesity is a risk factor for developing osteoarthritis, especially on weight bearing joints; both of these complications can cause significant pain and discomfort.

This work has important policy implications: our findings reinforce that pain is not a marginal issue, but is an emerging European epidemic, and a major public health concern that is associated with significant 'pain inequalities'. Crucially, the magnitude of the pain inequalities was highly variable between countries, which may suggest that there is opportunity to reduce inequalities in pain. In view of our findings, it is important that strategies are developed that seek to manage pain – and the associated complications – from a holistic perspective. Consideration should be given to physical challenges of pain, but also the behavioural, biological, and social determinants associated with it. For example, adjusting for poor housing and neighbourhood quality has been shown to reduce SES differences in pain, and other NCDs (McNamara *et al.*, 2017b). Developing interventions – at a population level – to reduce pain and the inequalities associated with it is thus an important area for future research – particularly if Europe is to avoid a US style opioid epidemic.

This paper provides a unique overview of estimates of pain and inequalities in pain in 19 European countries using a comparable and recent data source (ESS). Nonetheless, there are some limitations to the data presented here. We present the key issues below, but for a fuller discussion of the strengths and weaknesses of the ESS data see Eikemo *et al* (2017). Firstly, all the pain measures included here are self-reported, and only indicate whether a participant has experienced pain in the last 12 months; we did not consider the length, intensity or type of pain, nor did we seek to determine if a participant had a clinical diagnosis of chronic pain. Relatedly, we did not consider multimorbidity in our analysis; it is possible that other chronic conditions could be associated with pain prevalence (e.g. diabetes and neuropathy). Secondly, because the data are based on a survey rather than on register data or other sources that cover information on the full population, caution is needed in translating the estimates presented in this paper into statements about the population prevalence of pain in the countries covered. As with all surveys, it can be questioned whether the data are fully representative for the whole population, and bias may occur due to selective unit non-

response (e.g. respondents with physical or mental health problems may have been more likely to refuse participation in the survey) (Fitzgerald & Jowell, 2010; Häder & Lynn, 2007; Saris & Gallhofer, 2007). Response rates varied across countries, and this issue may have especially affected results for countries with a relatively low response rate (e.g. Germany); however, response rates are one measure of survey quality and in themselves they are not a direct indicator of non-response bias.[43] The ESS sets out high targets for response rates (70 percent) and low rates for non-contacts (3 per cent) as part of its approach of aiming for the standards of the best surveys in Europe (Stoop *et al*., 2010). It should also be noted that the data only cover the non-institutionalised population, which is likely to result in underrepresentation of individuals who are institutionalised due to serious health problems. Thirdly, although the 7th wave of the European Social Survey captures 19 countries from all European regions, several countries were not covered. This means that the estimates presented here cannot be generalized to all European countries, and that repetition and replication of the questions included in this survey is needed to obtain a fully comprehensive overview of pain prevalence in *all* European countries. Further, sample sizes in some countries for the socioeconomic status analysis were quite small. Finally, we used education as a measure of SES: although education is seen as the most comparable indicator of socioeconomic status across different countries (Eikemo *et al*., 2008), it should be noted that using a different indicator of socioeconomic status, such as occupation or income, might lead to different patterns of inequalities in pain across Europe. Finally, we only used a single indicator- education - to measure socio-economic status. Education is seen as the most comparable indicator for measuring socio-economic status across different countries (Eikemo *et al*., 2008) as it is a fundamental determinant of other indicators of socio-economic status including both occupation and income (Lahelma, 2001.; Ross and Wu, 1995). Education is a widely applied measure of socio-economic position and reflects people's material and non-material resources and is fixed rather than fluctuating (as in the case of income for example) (Knesebeck, 2006). However, it should be noted that using a different indicator of socio-economic status, such as

occupation or income, or multiple indicators might lead to different patterns of inequalities in pain across Europe. This is something that could be explored further.

Conclusion

This study provides the most up to date overview on the prevalence of pain in Europe and is the first to estimate socioeconomic inequalities in pain across 19 European countries for both men and women. It is clear that a substantial share of the European population experience the burden of pain, but also that the extent to which people experience pain depends strongly on country of residence, gender and socio-economic status. Any future strategies to reduce the burden of pain across Europe should acknowledge and consider the associated socioeconomic pain inequalities to ensure the 'pain gap' does not widen.

Conflict of Interest Statement

The authors have no conflict of interest to declare

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Contribution

CB and AT conceived the paper and drafted the manuscript with input from all authors. CM and MB conducted the analysis with input from CB, NA, AK, TH, TAE, and AT. KT generated the maps for the figures. All authors approved the final manuscript.

Figure 1: A map illustrating the prevalence of back/neck pain, hand/arm pain, and foot/leg pain across Europe.

Figure 2: A map illustrating age-adjusted rate differences in pain between medium education and high levels across Europe.

Figure 3: A map illustrating age-adjusted rate differences in pain between low education and high levels across Europe.

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Table 1: Prevalence of pain in 19 European countries (%)

		Back/Neck	Hand/Arm	Foot/Leg
Europe (pooled)		40.00%	22.34%	21.09%
North	*Denmark*	48.87%	26.72%	24.96%
	Finland	53.77%	31.67%	25.16%
	Norway	43.08%	26.58%	26.65%
	Sweden	47.56%	25.02%	26.87%
West				
	Austria	34.25%	15.85%	15.26%
	Belgium	51.76%	26.88%	26.50%
	Switzerland	40.68%	22.63%	19.19%
	Germany	54.05%	25.28%	22.20%
	France	51.84%	26.32%	30.91%
	Ireland	22.64%	13.32%	11.02%
	Netherlands	41.39%	21.18%	20.89%
	UK	38.98%	27.42%	23.44%
Central/Eastern				
	Poland	34.99%	22.17%	24.57%
	Slovenia	42.85%	20.25%	20.72%
	Lithuania	26.67%	13.00%	10.54%
	Czech	26.07%	13.08%	11.65%
	Hungary	16.08%	14.16%	12.60%
South				
	Spain	40.96%	25.92%	26.31%
	Portugal	47.56%	30.10%	31.84%

Prevalence's were weighted using ESS post-stratification weights and adjusted to the standard European population in accordance with the European Standard population (ESP) of 2013. Source: European Social Survey 2014.

Table 2: Prevalence of Pain by Education in 19 European countries (%)

		Back/Neck			**Hand/Arm**			**Foot/Leg**		
	Education level	***High***	***Medium***	***Low***	***High***	***Medium***	***Low***	***High***	***Medium***	***Low***
Europe (pooled)	*19 countries*	42.52%	47.61%	41.16%	17.70%	23.31%	30.27%	21.23%	23.30%	28.02%
North	*Denmark*	50.20%	49.76%	52.55%	17.60%	28.55%	34.74%	23.72%	27.18%	36.32%
	Finland	54.30%	57.34%	49.44%	19.89%	25.12%	36.60%	29.30%	28.71%	38.91%
	Norway	40.23%	48.09%	46.52%	21.24%	33.76%	31.55%	23.63%	29.44%	33.34%
	Sweden	48.36%	48.33%	51.05%	20.49%	29.47%	33.00%	20.38%	27.68%	27.34%
West										
	Austria	31.55%	34.02%	32.24%	7.70%	15.35%	16.43%	9.65%	15.48%	16.44%
	Belgium	45.78%	54.24%	57.44%	21.42%	25.71%	35.96%	24.63%	25.90%	29.40%
	Switzerland	39.09%	41.61%	41.20%	14.53%	20.04%	23.05%	20.96%	23.14%	24.01%
	Germany	47.24%	58.25%	57.94%	17.34%	24.08%	32.33%	21.53%	26.45%	32.24%
	France	58.13%	56.35%	46.17%	21.98%	32.09%	36.05%	22.81%	24.75%	31.53%
	Ireland	23.38%	19.87%	23.23%	7.88%	10.64%	10.84%	14.03%	11.94%	12.37%
	Netherlands	37.35%	43.80%	42.03%	18.75%	18.89%	22.18%	17.42%	19.92%	23.73%
	UK	34.23%	43.39%	36.05%	15.20%	24.15%	28.48%	22.94%	26.75%	29.30%
Central/Eastern										
	Poland	38.62%	35.55%	30.71%	17.42%	19.77%	26.71%	16.75%	18.88%	21.24%
	Slovenia	43.29%	40.92%	47.52%	13.68%	20.28%	30.09%	13.28%	18.61%	27.03%
	Lithuania	18.54%	29.05%	34.73%	3.29%	8.64%	25.69%	6.68%	10.48%	24.89%
	Czech	19.73%	23.78%	30.92%	7.11%	9.91%	22.16%	10.94%	10.29%	25.87%
	Hungary	12.62%	12.66%	22.12%	7.06%	8.45%	21.15%	7.50%	9.06%	27.95%

South										
	Spain	53.69%	45.68%	36.18%	23.47%	17.67%	30.28%	26.48%	21.12%	26.46%
	Portugal	45.90%	41.06%	50.88%	23.39%	24.17%	37.04%	19.01%	27.09%	35.20%

Prevalence's were weighted using ESS post-stratification weights and adjusted to the standard European population in accordance with the European Standard population (ESP) of 2013. Source: European Social Survey 2014.

Table 5: Age Adjusted Rate Ratios (ARR) and Age Adjusted Rate Differences (ARD) for educational inequalities in back/neck pain, hand/arm pain, and foot/leg pain in 19 European countries

			Back/neck pain		**Hand/arm pain**		**Foot/leg pain**	
		Education	***ARR (95% CI)***	***ARD (95% CI)***	***ARR (95% CI)***	***ARD (95% CI)***	***ARR (95% CI)***	***ARD (95% CI)***
Europe	*19 countries*	Medium	0.98 (0.91, 1.05)	-1% (-4%, 2%)	1.28 (1.23, 1.34)	5% (4%, 6%)	1.11 (1.06, 1.17)	2% (1%, 4%)
		Low	0.96 (0.83, 1.10)	-2% (-8%, 4%)	1.61 (1.49, 1.75)	11% (9%, 14%)	1.24 (1.12, 1.37)	5% (3%, 8%)
North								
	Denmark	Medium	1.01 (0.88, 1.16)	0% (-6%, 7%)	1.58 (1.23, 2.04)	10% (5%, 16%)	1.14 (0.90, 1.43)	3% (-3%, 9%)
		Low	1.10 (0.92, 1.31)	5% (-5%, 14%)	1.89 (1.41, 2.55)	16% (8%, 24%)	1.46 (1.12, 1.91)	11% (3%, 20%)
	Finland	Medium	1.08 (0.96, 1.20)	4% (-2%, 10%)	1.28 (0.86, 2.20)	5% (1%, 10%)	0.97 (0.81, 1.17)	-1% (-6%, 5%)
		Low	1.02 (0.85, 1.23)	1% (-9%, 11%)	1.95 (1.44, 2.64)	18% (9%, 28%)	1.22 (0.94, 1.59)	7% (-2%, 16%)
	Norway	Medium	1.23 (1.05, 1.43)	9% (2%, 15%)	1.57 (1.26, 1.97)	12% (6%, 18%)	1.19 (0.96, 1.47)	5% (1%, 11%)
		Low	1.21 (0.97, 1.52)	8% (-2%, 18%)	1.41 (1.01, 1.97)	9% (0%, 18%)	1.17 (0.84, 1.64)	4% (-5%, 14%)
	Sweden	Medium	1.01 (0.88, 1.15)	0% (-6%, 7%)	1.42 (1.13, 1.79)	9% (3%, 14%)	1.32 (1.05, 1.66)	7% (2%, 12%)
		Low	1.11 (0.90, 1.35)	5% (-5%, 15%)	1.58 (1.13, 2.21)	12% (2%, 22%)	1.21 (0.84, 1.75)	4% (-5%, 13%)
West								
	Austria	Medium	1.05 (0.85, 1.31)	2% (-5%, 9%)	1.85 (1.15, 2.97)	7% (3%, 12%)	1.14 (0.90, 1.43)	3% (-3%, 9%)
		Low	0.97 (0.73, 1.27)	-1% (-10%, 8%)	1.88 (1.11, 3.20)	8% (2%, 14%)	1.46 (1.12, 1.91)	11% (3%, 20%)
	Belgium	Medium	1.19 (1.04, 1.37)	9% (2%, 15%)	1.28 (0.86, 1.91)	4% (-1%, 10%)	0.97 (0.81, 1.17)	-1% (-6%, 5%)
		Low	1.28 (1.10, 1.49)	13% (5%, 20%)	1.90 (1.26, 2.84)	15% (8%, 22%)	1.22 (0.94, 1.59)	7% (-2%, 16%)
	Switzerland	Medium	1.07 (0.90, 1.29)	3% (-4%, 10%)	1.31 (0.94, 1.83)	5% (0%, 10%)	1.19 (0.96, 1.47)	5% (1%, 11%)
		Low	1.09 (0.86, 1.37)	3% (-6%, 13%)	1.49 (1.00, 2.22)	8% (0%, 15%)	1.17 (0.84, 1.64)	4% (-5%, 14%)
	Germany	Medium	1.24 (1.12, 1.37)	11% (6%, 16%)	1.39 (1.13, 1.70)	7% (3%, 11%)	1.32 (1.05, 1.66)	7% (2%, 12%)
		Low	1.25 (1.05, 1.47)	12% (2%, 21%)	1.79 (1.32, 2.42)	14% (5%, 22%)	1.21 (0.84, 1.75)	4% (-5%, 13%)
	France	Medium	0.97 (0.84, 1.13)	-1% (-9%, 7%)	1.47 (1.11, 1.94)	10% (3%, 17%)	1.14 (0.90, 1.43)	3% (-3%, 9%)
		Low	0.87 (0.71, 1.06)	-7% (-18%, 3%)	1.68 (1.22, 2.32)	15% (6%, 24%)	1.46 (1.12, 1.91)	11% (3%, 20%)

	Ireland	Medium	0.86 (0.67, 1.12)	-3% (-9%, 3%)	1.35 (0.88, 2.06)	3% (-1%, 7%)	0.84 (0.59, 1.20)	-2% (-7%, 3%)
		Low	1.03 (0.78, 1.35)	1% (-6%, 7%)	1.30 (0.82, 2.07)	2% (-2%, 7%)	0.78 (0.53, 1.15)	-3% (-8%, 2%)
	Netherlands	Medium	1.18 (0.98, 1.41)	6% (-1%, 13%)	0.99 (0.73, 1.34)	0% (-6%, 6%)	1.14 (0.85, 1.53)	3% (-3%, 8%)
		Low	1.16 (0.96, 1.40)	6% (-2%, 13%)	1.15 (0.86, 1.54)	3% (-3%, 9%)	1.29 (0.97, 1.73)	5% (-1%, 11%)
	UK	Medium	1.26 (1.06, 1.49)	9% (2%, 15%)	1.56 (1.19, 2.05)	9% (4%, 14%)	1.16 (0.93, 1.46)	4% (-2%, 9%)
		Low	1.05 (0.86, 1.27)	2% (-5%, 8%)	1.71 (1.30, 2.27)	11% (6%, 17%)	1.22 (0.95, 1.56)	5% (-1%, 11%)
Central/Eastern								
	Poland	Medium	0.90 (0.73, 1.11)	-4% (-12%, 4%)	1.03 (0.75, 1.43)	1% (-6%, 7%)	1.01 (0.73, 1.41)	0% (-6%, 7%)
		Low	0.78 (0.63, 0.97)	-9% (-16%, -1%)	1.34 (0.98, 1.83)	7% (0%, 13%)	1.07 (0.78, 1.48)	1% (-5%, 8%)
	Slovenia	Medium	0.94 (0.77, 1.15)	-3% (-11%, 6%)	1.47 (0.97, 2.22)	7% (0%, 13%)	1.31 (0.87, 1.97)	5% (-2%, 11%)
		Low	1.10 (0.85, 1.42)	4% (-8%, 16%)	2.10 (1.30, 3.36)	15% (6%, 25%)	1.68 (1.05, 2.71)	10% (1%, 19%)
	Lithuania	Medium	1.52 (1.19, 1.96)	10% (5%, 16%)	2.40 (1.42, 4.05)	6% (3%, 8%)	1.44 (1.06, 2.15)	4% (0%, 8%)
		Low	1.53 (1.12, 2.09)	11% (3%, 19%)	5.15 (2.93, 9.03)	17% (10%, 23%)	2.13 (1.34, 3.38)	10% (4%, 16%)
	Czech	Medium	1.20 (0.92, 1.58)	4% (-2%, 10%)	1.35 (0.84, 2.14)	3% (-1%, 7%)	0.94 (0.63, 1.41)	-1% (-6%, 4%)
		Low	1.39 (0.92, 2.10)	8% (-3%, 19%)	2.33 (1.25, 4.34)	11% (2%, 20%)	1.92 (1.14, 3.25)	11% (1%, 20%)
	Hungary	Medium	1.04 (0.72, 1.52)	1% (-4%, 5%)	1.22 (0.78, 1.90)	2% (-2%, 6%)	1.30 (0.82, 2.06)	3% (-2%, 7%)
		Low	1.50 (0.95, 2.36)	7% (-1%, 14%)	2.24 (1.33, 3.80)	10% (3%, 17%)	2.82 (1.71, 4.65)	15% (8%, 23%)
South								
	Spain	Medium	0.85 (0.72, 1.00)	-8% (-16%, 0%)	0.76 (0.56, 1.04)	-6% (-13%, 1%)	0.81 (0.61, 1.07)	-5% (-13%, 2%)
		Low	0.68 (0.59, 0.79)	-17% (-24%, 10%)	1.20 (0.95, 1.53)	5% (-1%, 11%)	0.93 (0.73, 1.17)	-2% (-9%, 4%)
	Portugal	Medium	0.91 (0.66, 1.25)	-4% (-18%, 10%)	1.03 (0.60, 1.77)	1% (-13%, 14%)	1.42 (0.89, 2.25)	9% (-3%, 21%)
		Low	1.11 (0.87, 1.43)	5% (-7%, 17%)	1.51 (0.96, 2.37)	13% (1%, 24%)	1.65 (1.12, 2.42)	14% (5%, 23%)