

Eikemo T, Huisman M, Bambra C, Kunst A.

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# *Health inequalities according to educational level in different welfare regimes: a comparison of 23 European countries*

**T.A.Eikemo,<sup>1,2\*</sup> M.Huisman,<sup>2,3</sup> C.Bambra,<sup>4</sup> and A.E.Kunst<sup>2</sup>**

<sup>1</sup> *Institute of Political Science and Sociology, Norwegian University of Science and Technology, Norway.*

<sup>2</sup> *Department of Public Health, Erasmus MC, Netherlands.*

<sup>3</sup> *Department of Psychiatry, University Medical Center Groningen, Netherlands*

<sup>4</sup> *Centre for Public Policy and Health, Durham University, UK*

\* Corresponding author: Department of Political Science and Sociology, Norwegian University of Science and Technology, 7491 Trondheim, Norway.  
E-mail: Terje.Andreas.Eikemo@svt.ntnu.no

## **Abstract**

Socio-economic inequalities in health are substantial in advanced industrial societies. The object of this study was to determine whether the magnitude of educational health inequalities varies between European countries with different welfare regimes. The data source is based on the first and second wave of the European Social Survey (ESS), comprising more than 80,000 respondents. Two health indicators were applied. The first describes people's mental and physical health in general, while the second reports cases of any limiting longstanding illness. Educational inequalities in health were measured as the difference in health between people with average number of years of education and people whose educational years lay one standard deviation below the national average. South European welfare regimes had the largest health inequalities (with an exception of a smaller rate difference for limiting longstanding illness), while countries with Bismarckian welfare regimes tended to demonstrate the smallest. Although the other welfare regimes ranked relatively close to each other, the Scandinavian welfare regimes were placed less favourably than the Anglo-Saxon and East European. Thus, this study showed an evident patterning of magnitudes of health inequalities according to features of European welfare regimes. Although the greater distribution of welfare benefits within the Scandinavian countries are likely to have a protective effect for disadvantaged in these countries, other factors such as relative deprivation and class patterned health behaviours might be acting to widen disparities in health.

## **Introduction**

Recent studies using data collected in national health surveys or national longitudinal mortality studies have indicated that considerable socio-economic inequalities in morbidity and mortality are present across Europe (Cavelaars et al., 1998; Fox, 1994; Huisman et al., 2003; 2004; Kunst et al., 2005; Lahelma et al., 1994; Mackenbach, 2005, Mackenbach et al, 1997a; 1997b; 1999; 2000; Silventoinen & Lahelma, 2002; Knesebeck et al., 2006). Rather surprisingly, given that their overall population health is amongst the best in the world, countries that emphasise egalitarian principles, such as Sweden and Norway, do not seem to offer any exceptions in this respect. This has generated public debate and political mobilization within the Social Democratic welfare states, as well as extensive discussion as to how social inequalities in health should be tackled and measured (Judge et al., 2005). This also leaves open to question to what extent socio-economic inequalities in health in European countries are related to the type of welfare state. Previous studies have shown that overall population health differs substantially by welfare regime (Navarro et al, 2003; 2006; Coburn, 2004; Bambra, 2006). Therefore, in this study we examine whether the magnitude of socio-economic inequalities (assessed using the proxy measure of educational level) in self-assessed health varies by welfare regime. Specifically, we examine the following two hypotheses:

- (1) Different types of welfare regimes are associated with differences in overall levels of health, and relative and absolute health inequalities.
- (2) The cross-national variation in health and inequalities in health is smaller *within* specific welfare regimes than *between* different welfare regimes.

### ***Educational inequalities in health in Europe***

People with lower educational attainment have poorer self-reported health, higher rates of infectious disease and shorter life expectancy than the better educated (Feldman et al., 1989;

Guralnik et al., 1993; Kitagawa & Hauser, 1973). Although people's socioeconomic position may be more accurately expressed by occupation or income, we might argue that education lies at the heart of people's position in society because it is a fundamental determinant of both occupation and income (Lahelma, 2001; Ross & Wu, 1995). Education is a widely applied measure of socioeconomic position and reflects people's material and non-material resources and shapes the likelihood of being unemployed (Kneesebeck, 2006). Within Europe, the size of educational inequalities in health varies, and it has been shown that health inequalities by educational level are relatively large in the welfare states of Sweden, Norway and Denmark, while inequalities in Spain, Switzerland and West Germany are smaller. Intermediate positions have been observed for Finland, UK, France, and Italy (Cavelaars et al., 1998). A Finnish study comparing the Nordic welfare states, found that educational health inequalities in 1994 were largest in Norway (Silventoinen & Lahelma, 2002). More recent international studies have also documented that the size of educational health inequalities varies between countries (Huisman et al., 2003; Kneesebeck et al., 2006). However, no study has yet specifically tested differences in inequalities in health between countries according to welfare regime theory.

### ***Welfare regimes***

In the *Three Worlds of Welfare Capitalism* (1990), Esping-Andersen presents the first serious attempt to classify welfare states. His typology is based upon the operationalization of three principles: decommodification (the extent to which an individual's welfare is reliant upon the market), social stratification (the role of welfare states in maintaining or breaking down social stratification), and the private-public mix (the relative roles of the state, the family and the market in welfare provision). The application of these principles leads to the division of welfare states into three ideal regime types (Figure 1): Liberal, Conservative, and Social Democratic. The modal examples of the three regimes are USA (Liberal), Germany (Conservative), and Sweden (Social Democratic). In the Liberal regime countries, state provision of welfare is minimal, benefits are

modest and often attract strict entitlement criteria, and recipients are usually means-tested and stigmatized (Esping-Andersen, 1990: 26). The Conservative welfare state regime is distinguished by its 'status differentiating' welfare programs in which benefits are often earnings related, administered through the employer, and geared towards maintaining existing social patterns. The role of the family is also emphasized and the redistributive impact is minimal (1990: 27). The Social Democratic regime is the smallest regime cluster. Welfare provision is characterized by universal and comparatively generous benefits, a commitment to full employment and income protection, and a strongly interventionist state used to promote equality through a redistributive social security system.

-- Figure 1 about here --

There has been extensive scholarly debate about the theoretical and empirical value of the Three Worlds (for a detailed summary see Arts & Gelissen, 2002). Numerous critiques exist about the range of countries and regimes most notably the misclassification of the Southern European welfare states as immature Conservative ones or placing the Antipodean welfare states in the Liberal regime (see for example, Leibfreid, 1992; Castles & Mitchell, 1993; Ferrera, 1996; Bonoli, 1997; Navarro et al, 2003); the absence of gender in the typology (see for example, Sainsbury, 1994, 1999; Bambra, 2004; in press); the methodology (Castles & Mitchell, 1993; Kangas, 1994; Ragin, 1994; Fawcett & Papadopoulos, 1997; Pitruzello, 1999; Bambra, 2006); the analytical focus on cash benefits (Alber & Standing, 2000; Abrahamson, 1999; Kautto, 2002; Bambra, 2005a; 2005b), and the creation of regimes that generalize about all forms of social policy provision from this base (Kasza, 2002; Bambra, 2005a, 2005b).

As a result of this criticism, modified or alternative typologies have been proposed by others (Leibfried, 1992; Castles & Mitchell, 1993; Siaroff, 1994; Ferrera, 1996; Bonoli, 1997; Korpi &

Palme, 1998; Navarro et al, 2003; Bambra, 2004, 2005b, in press), most of which place emphasis on those characteristics of welfare states not extensively examined by Esping-Andersen. The welfare ideal-types of Esping-Andersen have also been tested empirically (Kangas, 1994; Ragin, 1994; Wildeboer Schut et al, 2001; Bambra, 2006, 2007). Although the findings were not totally consistent, the major concern was that Esping-Andersen's typology does not fully capture country range and variation and that therefore, the insertion of a fourth 'Southern European' regime is required (Leibfreid, 1992; Ferrera, 1996; Bonoli, 1997; Bambra, 2007). However, we have yet to see a new categorisation, which has been generally accepted as the new standard typology of welfare regimes, although Ferrera's four-fold typology has been highlighted as one of the most accurate (Bambra, 2007). Ferrera focuses on different dimensions of how social benefits are granted and organised, and makes a distinction between the Scandinavian (Social Democratic), Anglo-Saxon (Liberal), Bismarckian (Conservative) and Southern countries (Figure 1). Although there are clear similarities between Ferrera's and Esping-Andersen's typologies, Ferrera's classification is intended to account for differences in the way welfare is delivered whilst Esping-Andersen's still tends to emphasise the quantity of welfare provided (Bonoli, 1997; Bambra, 2007). In this way, the additional Southern regime is characterised by a fragmented system of welfare provision which consists of diverse income maintenance schemes that range from the meagre to the generous and a health care system that provides only limited and partial coverage. There is also a strong reliance on the family and charitable sector (Ferrera, 1996).

One new challenge to conventional welfare regime typologies concerns the Eastern European countries (Czech Republic, Estonia, Hungary, Poland, Slovakia, and Slovenia). According to Esping-Andersen (1999), these countries comprise clearly the most under defined and understudied region. These countries have experienced extensive economic upheaval and have undertaken comprehensive social reforms throughout the 1990s (Kovacs, 2002). They have emphasised the Liberal regime approaches of marketisation, decentralization and the reform of

health insurance schemes (EC and WHO, 2002). In comparison with the other member states of the European Union, they have limited health service provision and overall population health is relatively poor. It will therefore be interesting to see how these countries rank in comparison to more established Western European welfare states.

Our study utilises survey data from 23 European countries, which we categorise into five regimes based upon Ferrera's (1996) classification, plus an additional category for Eastern Europe (Table 1).

--- Table 1 about here ---

## **Data and Methods**

This study was conducted as part of the European Union funded 'Tackling Health Inequalities in Europe (Eurothine)' project (<http://mgzlx4.erasmusmc.nl/eurothine/>). It is based on data from the first and second wave of the European Social Survey (ESS), fielded in 2002 and 2004, comprising more than 80,000 respondents in 23 countries. The main objective of the ESS is to provide high quality data over time about changing social attitudes and values in Europe. The data and extensive documentation are freely available for downloading at the Norwegian Social Science Data Services (NSD) web site (<http://www.nsd.uib.no>). A total number of 77805 respondents were available in the sample after deleting cases listwise by each variable in our analysis. It should be noted that we have data for only one year with respect to Italy, Slovakia, and Estonia, which makes the sample size smaller in these countries compared to the others, as shown in Table 1. Response percentages are also given in Table 1. Most countries have a sufficient response, but we are left with some uncertainty regarding the low response percentage of Switzerland in the first ESS-round (33.5 %). Another methodological issue is that our sample comes from two sweeps of the ESS. We therefore tested the effect of combining these data by means of a sensitivity analysis.

This analysis (not shown in tables) showed that our main results could be replicated on the basis of each survey separately.

We used both indicators of morbidity available in the ESS: self reported general health and limiting longstanding illness. Self reported general health was constructed from a variable asking; ‘How is your (physical and mental) health in general?’. Eligible responses were ‘very good’, ‘good’, ‘fair’, ‘bad’, and ‘very bad’. We dichotomized the variable into ‘very good or good’ health versus ‘less than good’ health (‘fair’, ‘bad’, and ‘very bad’). As for limiting longstanding illness, people were asked if they were hampered in daily activities in any way by any longstanding illness or disability, infirmity or mental health problem. Eligible responses were ‘yes a lot’, ‘yes to some extent’ and ‘no’. We dichotomized this variable into ‘yes’ (regardless of whether to some extent or a lot) and ‘no’.

### ***Computation and interpretation of the measure of educational inequalities in health***

The ESS-data file provides two variables of educational attainment – the first is a recoded variable that focuses on levels of education achieved, while the second gives years of full-time education. Analysing education as highest attained level complicates comparisons between countries as the population distribution across the levels of education strongly differs between countries ([Kneesebeck et al, 2006](#)). One solution would be to adjust for the size of each educational group by calculating the RII ([Mackenback & Kunst, 1997b](#)). However, we prefer to use the second available variable on education in our sample - full-time education in years – because there is a higher degree of international comparability and flexibility in its use. We also have to take into account the extent of variations of reported years of education in different countries, because the variation is larger in for example southern countries compared to the northern. We did this by applying a *total impact* measure of education. First, for each country separately, we standardised the continuous variables of educational attainment, such that the

national average was equal to 0 and the standard deviation equal to 1 year of education. Second, we reverted this variable by multiplying it with a factor of -1, such that higher values corresponded with lower educational levels. Next, the standardised variable was introduced as an independent variable in a logistic regression analysis, controlled for age, with health variables as the dependent variable. Finally, we transformed the odds ratios of each regression coefficient by calculating their exponential functions. The odds ratios should be interpreted as the health difference between people with average years of education and those whose number of year of education is one standard deviation below the national average.

The first hypothesis that is tested in our study states that welfare regimes are associated with both absolute and relative measures of health inequalities. Firstly, we calculated the (age-adjusted) percentages of the total sample reporting fair/poor general health and limiting longstanding illness in each country. Secondly, we calculated the rate differences (RD) between the higher and lower education group using the median of the total impact measure within each country as cut-off point. Both measures were age-standardized using the weighted European population average as a basis.

To assess the extent to which cross-national differences in the magnitude of health inequalities could be explained by grouping countries according to welfare type we performed one-way ANOVA tests. We specifically tested whether the between group variance of the three statistical measures (overall prevalence, absolute difference, and relative inequalities) differed significantly from the within group variance. In addition, we calculated R squares by dividing the between group sums of squares (SSb) with the total sums of squares (SS<sub>T</sub>), in order to determine the percentages of between-country variance that is explained by the welfare regime clusters.

The analysis is based on responses from people aged 18 or over. A weight has been applied (dweight) to correct for design effects due to sampling designs in countries where not all individuals in the population have an identical selection probability.

## **Results**

Table 2 shows that East European welfare regimes have the highest prevalence of ill-health for men and women with respect to both health indicators. South European welfare regimes have the second highest prevalence of self-assessed fair/poor general health, while they have the lowest prevalence of limiting longstanding illness. The dissimilar reporting of ill-health between limiting longstanding illness and self-assessed fair/poor health in the South is relatively large. Although the prevalence of fair/poor self-assessed health is larger than those of limiting longstanding illness within all other welfare regimes, the difference is largest in the South. This might suggest that self-assessed health is comprehended differently the South than elsewhere. The Anglo-Saxon welfare regimes demonstrate the smallest prevalence rates for fair/poor general health and the second smallest for limiting longstanding illness.

--- Table 2 about here ---

Furthermore, Table 2 shows that health inequalities are significant for both men and women, according to both health indicators, and within all welfare regimes. South European welfare regimes have the largest health inequalities, both with respect to rate differences and odds ratios, with the exception of the rate difference for limiting longstanding illness. Clearly, Bismarckian welfare regimes were observed with the smallest health inequalities, even though the prevalence rates were only average. Although the other welfare regimes rank relatively close to each other, the Scandinavian welfare regimes are placed less favourably than the Anglo-Saxon and Eastern European. Our results refer to the point estimates however, and it should be noted that the

confidence intervals of the welfare types overlap, meaning that they cross-regime variations in health inequalities might be attributable to chance fluctuations. Country-specific results are shown in Table 3. Prevalence rates and odds ratios were also converged into scatter plots (Figure 2 and 3), showing graphically whether the countries cluster within each welfare regime.

--- Table 3, Figure 2 and Figure 3 about here ---

Figure 2 and Figure 3 give the results for men and women's reporting of limiting longstanding illness and fair/poor general health respectively. The Scandinavian countries are pretty tightly clustered. The only divergence from this pattern was found with respect to the reporting of fair/poor general health among Finnish (high OR compared to other Scandinavian countries) and Swedish (low OR compared to other Scandinavian countries) men. The South European countries, which do not appear to cluster markedly with respect to the results of self-assessed fair/poor health, reported fewest cases of longstanding illness, but had relatively large relative health inequalities. However, it should be remarked that Italian men and women, together with Spanish men, demonstrate smaller odds ratios than the other South European countries.

Bismarckian countries are fairly clustered below the x-axis, which indicates average odds ratios. The only exception is with regard to the high odds ratios reported among Luxembourg men concerning the reporting of fair/poor general health. With respect to the Anglo-Saxon welfare regime, Ireland seems to have lower prevalence rates than those of Great Britain, but both countries are advantageously placed with regard to both sexes and both health indicators. Although men and women living in East European countries reported poorer general health and more cases of limiting longstanding illness than people in other European countries, they

demonstrated average magnitudes of odds ratios. However, a few exceptions should be mentioned. First, Polish men have higher odds ratios with respect to the results of limiting longstanding illness. Secondly, Hungarian women have highest odds ratios for self-assessed health, while the odds ratios are among the smallest for Slovak men and women with regard to self-assessed health. Generally, for limiting longstanding illness among both men and women, the countries cluster according to welfare typologies. For fair/poor general health, however, the clustering is not as strong.

The one-way ANOVA-test showed that within welfare group variance is significantly smaller than the between welfare group variance for measures of limiting longstanding illness (except from the RD-measure of men), but not with regard to fair/poor general health (except from the prevalence) (see Table 4). This implies that the Ferrera welfare typology explains at least 50% of the cross-national variations with regards to longstanding illness, but not with regard to general health.

--- Table 4 about here ---

## **Discussion**

Our results have provided evidence for the hypothesis that welfare regimes are associated with cross-national differences in the overall level of self-reported health, and with absolute and relative educational health gaps. We observed that East European welfare regimes have the highest prevalence of both health indicators, while South European welfare regimes have the second highest prevalence of self-assessed poor general health, and the lowest prevalence of limiting longstanding illness. Apart from the low prevalence in the South for limiting longstanding illness, the Anglo-Saxon welfare regimes have the lowest prevalence for both health indicators and for both sexes. Furthermore, Southern European welfare regimes have the

largest health inequalities (with an exception of the rate difference for limiting longstanding illness), while countries with Bismarckian welfare regimes tend to demonstrate the smallest. Although the East European, Anglo-Saxon and Scandinavian welfare regimes rank relatively close to each other, the Scandinavian welfare regimes are placed less favourably than the Anglo-Saxon and Eastern European. Furthermore, countries within each welfare regime seem to cluster strongly according to most measures of longstanding illness.

There are some important methodological issues that may have influenced our results. Firstly, the ESS response rates vary strongly between countries, as shown in Table 2. This is especially the case for the first wave in Switzerland, which had a response rate of only 33.5 %. This number is critically small, and it could be the reason why Switzerland has lower prevalence rates, absolute differences and odds ratios than the average scores for both health indicators and for both sexes. If the non-response is related to health and socio-economic position, then this would produce biased inequality measures.

Secondly, we found that the country clustering in 5 welfare regimes is more evident for the results of longstanding illness compared to those of less than good general health. This seems reasonable, because people's view on general health is profoundly shaped by their national cultural background (Salomon et al., 2004; Appels et al., 1996; Jylhä et al., 1998). The differences in absolute levels of health between countries may suggest that the question on general health is perceived differently across countries, and is thus sensitive to cultural variations. We have already noted that self-assessed health might be comprehended differently in the South than elsewhere, and this would bias the odds ratios if the comprehension of health also varies across educational levels. However, a growing number of studies have shown that measures of self assessed health are strongly correlated with more objective measures such as mortality (Idler & Benyamini, 1997; Heistaro et al., 2001). We also calculated Pearson's

correlation between subjective health measures (age-adjusted percentage of people with fair/poor health and limiting longstanding illness) with adult mortality, using data collected from the WHO. The results demonstrated that high age-adjusted prevalence of fair/poor general health ( $R_{\text{men}}=0.82$ ,  $R_{\text{women}}=0.58$ ) and limiting longstanding illness ( $R_{\text{men}}=0.45$ ,  $R_{\text{women}}=0.48$ ) is associated with higher adult mortality for men and for women, but particularly with respect to men's fair/poor general health. Previous studies have also shown that the apparent association of self-assessed health with mortality does not, or only slightly, differ between socio-economic groups ([Burstrom et al., 2001](#); [Van Doorslaer & Gerdtham, 2003](#); [Huisman et al., 2007](#)).

### **Welfare state regimes, health and health inequalities**

We observed that countries with lowest average years of education, namely the Southern and Eastern European countries, have the largest overall prevalence rates of ill-health (except for the lower prevalence of limiting longstanding illness in the South), whilst the Anglo-Saxon countries have the lowest prevalence rates. This is in keeping with the majority of previous research into variations in population health (such as infant mortality or total mortality) by welfare state regimes (see for example, [Navarro et al, 2003; 2006](#); [Coburn, 2004](#); [Bambra, 2006](#)).

We observed that grouping welfare regimes explained a meaningful part of the variance in the prevalence, and absolute and relative health gaps of limiting longstanding illness of the relevant European populations. This partly confirms our second hypothesis that grouping countries into welfare types decreases the variation of health inequality measures significantly. The country clustering in five welfare regimes was more evident for the results of limiting longstanding illness compared to those of less than good general health.

A recent review on studies of morbidity differences [Dahl et al. \(2006\)](#) did not find a patterning of health inequalities according to features of welfare regimes. However, their study rested on

Esping-Andersen's typology, it was based on measures of relative inequalities only, and in addition, national data sources were used, with a lower degree of international variation, which comprised fewer countries than the ESS.

It appeared that health inequalities in our study were smallest in Bismarckian countries and largest in Southern Europe. This finding is in keeping with other studies. Two previous studies of general self-reported health by level of education using the European Community Household Panel (ECHP) support these findings. In a study of older men and women, [Huisman et al. \(2003\)](#) found lowest health inequalities in Bismarckian countries (Belgium, France and Belgium) and largest in the south (Italy, Greece and Spain). Denmark, which was the only Nordic country in this study, had large inequalities for men, but smaller inequalities among women. They also found rather large inequalities in the two Anglo-Saxon countries. Using the same survey, [Van Doorslaer & Koolman \(2004\)](#) found particularly large income related health inequalities in self-assessed health in Portugal and relatively low inequalities in Netherlands and Germany.

With regard to chronic conditions, [Dalstra et al. \(2005\)](#) compared results from eight national health surveys and did not find higher or smaller health inequalities with respect to nine chronic disease groups in the South (Italy and Spain) compared to Bismarckian countries (Belgium, France and the Netherlands). However, they observed smaller inequalities in heart disease prevalence. [Cavelaars et al. \(1998\)](#) did not reveal a pattern between Bismarckian and South European countries, but they found a tendency for inequalities to be relatively large in the North (Sweden, Norway and Denmark).

The studies on morbidity are largely confirmed by previous comparative studies on mortality differences by educational level. [Mackenbach et al. \(1997\)](#) reported average-size inequalities in the Nordic countries, while [Huisman et al. \(2005\)](#) found smaller inequalities in total mortality in

men and women aged 40 or more in Turin and Barcelona & Madrid compared to Belgium, Austria and Switzerland.

We should be aware that those reports were based on different data sources, covering different periods and partly different age groups. Only a few of these studies found that South European countries had large inequalities, compared to Bismarckian countries. A generalised finding though is that inequalities in the Nordic countries are not among the smallest.

### *The Scandinavian welfare regime*

Notably, in terms of educational health inequality, countries in the Scandinavian welfare regime were placed less favourably than those in the Anglo-Saxon and Eastern European regimes. Only Sweden shows relatively small inequalities from an international perspective, perhaps reflecting the longevity of the Swedish welfare state. These results are surprising, as we would have expected the Scandinavian welfare states, given that they provide the most extensive welfare provision (for example, they are the most decommodifying ([Esping-Andersen, 1990](#))), to be some of the best performing countries in terms of the degree of health equity. Not only did we find that relative inequalities in the Scandinavian regimes were not among the smallest, but worryingly, this was also the case with regard to absolute inequalities.

This finding requires attention. Drawing upon the work of [Dahl et al \(2006\)](#), we speculate that relative deprivation, and class related health behaviours may be factors behind our findings. In addition, we suggest that social exclusion may be a contributory mechanism.

Relative deprivation is result of expectations and comparisons with other individuals and groups ([Dahl et al, 2006](#)). Relative deprivation will occur in all societies, in which there is inequality, including the Scandinavian welfare states. Following Dahl and colleagues, it is possible to

speculate that the effects of relative deprivation may be more extensive in the Scandinavian welfare states because of the high levels of expectation of upward social mobility and prosperity that they generate amongst the less privileged, expectations that are seldom met (Yngwe et al. 2003). This may increase health inequalities especially in stress related conditions, such as heart disease or indeed self-assessed health.

Dahl and colleagues also suggest that the relatively large socio-economic differences in smoking prevalence in the Scandinavian countries (Cavelaars et al. 2000) may well contribute to health inequalities.

Furthermore, the previously homogenous Scandinavian countries have experienced considerable immigration over the last decade. Immigrants are often marginalised within the Scandinavian welfare states, and are without entitlement to the full benefits of the universalistic system and are more likely to experience unemployment and social exclusion. Such groups are also most likely to be amongst the least educated in society. A study comparing immigrants from Poland, Turkey, and Iran with Swedish born persons revealed a strong association between ethnicity and poor self reported health, which was mediated by socioeconomic status, poor acculturation, and discrimination (Wiking et al., 2004). Another study found a large diversity of self-rated health, prevalence of diabetes and distress between ethnic Pakistanis and native Norwegians (Syed et al., 2006). However, further research into the ethnic make up of people with the lowest education would be useful to explore this explanation.

Although these different explanations are somewhat speculative, they point to causal mechanisms in which education may play a role. Finding empirical evidence for these causal mechanisms should be explored in future studies.

## **Conclusion**

The prevalence of ill-health, and absolute and relative educational inequalities in health in European countries appears to cluster according to the welfare regimes to which these countries belong. This was especially the case with regard to the reporting of limiting longstanding illness. Welfare is provided in dissimilar fashion both qualitatively and quantitatively across welfare regimes. In addition to comparing countries individually, forthcoming research might thus derive advantage from adapting a welfare regimes point of view.

Our results suggest that the “South European” (excluding Italy) family-oriented welfare system does not sufficiently buffer ill-health among disadvantaged groups. Italy pioneered the welfare state expansion in the South by the end of the 1940s, while democracy consolidated in the late 1970s (and welfare state expansion even later) in Portugal, Spain and Greece in a highly compressed time ([Ferrera, 2005](#)). Although the South European countries have fully caught up with the traditional Western democracies in terms of economic growth and rapid expansion of the welfare system, they entered the epoch of modernity in a state of socio-economic and political decline ([Sapelli, 1995](#)).

Although the Eastern European countries had the highest prevalence rates, they moreover held an average position in Europe, both with regard to absolute and relative educational inequalities in health. Future research would benefit from considering Eastern European countries as a separate welfare state regime and to look at the health effects of specific distributive policies and mechanisms within these countries.

The Scandinavian countries, except from Sweden, had rather large relative and absolute inequalities in health and only intermediate prevalence rates. The distribution of welfare benefits within the Scandinavian countries certainly has a protective effect for disadvantaged groups

compared to those in other welfare regimes. However, we should question to what extent this is counteracted by some unintended mechanisms, such as expectations of upward social mobility and prosperity that might tend to inadvertently widen educational inequalities in health.

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<b>Author</b>	<b>Welfare Regimes</b>			
Esping-Andersen (1990)	<i>Liberal</i>	<i>Conservative</i>	<i>Social Democratic</i>	
	Australia Canada Ireland New Zealand UK USA	Finland France Germany Japan Italy Switzerland	Austria Belgium Netherlands Denmark Norway Sweden	
Ferrera (1996)	<i>Anglo-Saxon</i>	<i>Bismarckian</i>	<i>Scandinavian</i>	<i>Southern</i>
	Ireland UK	Austria Belgium France Germany Luxembourg Netherlands Switzerland	Denmark Finland Norway Sweden	Greece Italy Portugal Spain

Figure 1: Welfare state typologies

**Table 1**  
**Country statistics (N = 77805)**

Welfare regime	Country	Sample size (N)				Included in the analysis	Response rate		Years of education	
		2002		2004			2002	2004	Men	Women
		Achieved interviews	Missing data	Achieved interviews	Missing data				Average (s.deviation)	Average (s.deviation)
Scandinavian	Denmark	1506	4.12 %	1487	5.18 %	<b>2854</b>	67.7	64.3	13.43 (3.64)	13.18 (3.58)
	Finland	2000	5.70 %	2022	5.09 %	<b>3805</b>	73.2	70.7	12.05 (3.91)	12.49 (4.11)
	Norway	2036	1.62 %	1760	3.92 %	<b>3694</b>	65.0	66.2	13.33 (3.54)	13.25 (3.64)
	Sweden	1999	4.95 %	1948	4.77 %	<b>3755</b>	69.5	65.9	12.13 (3.46)	12.23 (3.51)
Anglo-Saxon	Ireland	2046	9.24 %	2286	8.09 %	<b>3958</b>	64.5	59.7	12.82 (3.61)	12.98 (3.32)
	United K.	2052	3.36 %	1897	4.27 %	<b>3799</b>	55.5	54.6	12.66 (3.38)	12.50 (3.09)
Bismarckian	Austria	2257	5.49 %	2256	9.44 %	<b>4176</b>	60.4	62.4	12.51 (3.04)	12.09 (2.94)
	Belgium	1899	10.48 %	1778	5.01 %	<b>3389</b>	59.2	61.2	12.52 (3.79)	12.14 (3.79)
	France	1503	5.32 %	1806	4.21 %	<b>3153</b>	43.1	43.6	11.88 (4.05)	11.82 (4.08)
	Germany	2919	6.41 %	2870	8.82 %	<b>5349</b>	55.7	51.0	13.48 (3.39)	12.62 (3.29)
	Luxembourg	1552	15.53 %	1635	8.13 %	<b>2813</b>	43.9	50.1	12.33 (4.24)	11.80 (4.20)
	Netherlands	2364	3.17 %	1881	2.60 %	<b>4121</b>	67.9	65.1	13.20 (3.93)	12.28 (3.61)
	Switzerland	2040	3.87 %	2141	3.08 %	<b>4036</b>	33.5	48.6	10.89 (3.37)	10.62 (3.15)
Southern	Greece	2566	3.43 %	2406	2.83 %	<b>4816</b>	80.0	78.8	10.57 (4.60)	9.33 (4.53)
	Italy	1207	6.05 %	n.a.	n.a.	<b>1134</b>	43.7	n.a.	11.04 (4.64)	10.27 (4.92)
	Portugal	1511	4.77 %	2052	3.95 %	<b>3410</b>	68.8	71.2	7.73 (4.55)	6.93 (4.74)
	Spain	1729	13.01 %	1663	6.55 %	<b>3058</b>	53.2	59.7	11.14 (5.45)	10.53 (5.65)
Eastern	Czech R.	1360	6.03 %	3026	10.44 %	<b>3988</b>	43.3	55.3	12.68 (2.51)	12.24 (2.52)
	Estonia	n.a.	n.a.	1989	6.18 %	<b>1866</b>	n.a.	79.1	11.96 (3.11)	12.19 (3.71)
	Hungary	1685	5.16 %	1498	5.27 %	<b>3017</b>	69.9	65.4	12.09 (3.38)	11.64 (3.52)
	Poland	2110	7.73 %	1716	6.99 %	<b>3543</b>	73.2	73.7	11.63 (3.23)	11.42 (3.49)
	Slovakia	n.a.	n.a.	1512	12.04 %	<b>1330</b>	n.a.	64.2	12.36 (3.06)	11.84 (2.93)
	Slovenia	1519	5.46 %	1442	9.50 %	<b>2741</b>	70.5	69.7	11.81 (3.34)	11.10 (3.50)

**Table 2**  
**Odds ratios (95% CI), prevalence rates and absolute differences for each welfare system separately (N=77805)**

Welfare regime	Limiting longstanding illness						Fair/poor general health					
	Men			Women			Men			Women		
	Prev	RD	OR (95% CI)	Prev	RD	OR (95% CI)	Prev	RD	OR (95% CI)	Prev	RD	OR (95% CI)
Scandinavian	24.7	9.5	<b>1.37 (1.29 – 1.45)</b>	28.5	8.1	<b>1.34 (1.26 – 1.43)</b>	26.0	10.5	<b>1.44 (1.35 – 1.53)</b>	28.5	12.1	<b>1.54 (1.44 – 1.64)</b>
Anglo-Saxon	20.4	5.9	<b>1.31 (1.19 – 1.43)</b>	19.9	6.4	<b>1.23 (1.12 – 1.34)</b>	20.8	9.6	<b>1.35 (1.23 – 1.48)</b>	21.5	8.2	<b>1.29 (1.18 – 1.41)</b>
Bismarckian	21.6	4.2	<b>1.16 (1.10 – 1.21)</b>	23.5	4.0	<b>1.17 (1.12 – 1.23)</b>	26.8	6.4	<b>1.19 (1.14 – 1.24)</b>	30.9	5.7	<b>1.25 (1.20 – 1.30)</b>
Southern	13.7	5.7	<b>1.38 (1.26 – 1.51)</b>	19.2	9.5	<b>1.63 (1.49 – 1.78)</b>	30.5	14.8	<b>1.57 (1.47 – 1.69)</b>	40.2	17.3	<b>1.69 (1.58 – 1.81)</b>
Eastern	29.7	5.4	<b>1.26 (1.19 – 1.33)</b>	30.7	10.5	<b>1.42 (1.34 – 1.50)</b>	44.4	11.0	<b>1.39 (1.32 – 1.47)</b>	50.4	12.8	<b>1.54 (1.46 – 1.63)</b>

**Prev** = age-adjusted prevalence of ill-health. **RD** = age-adjusted rate difference (percentage) between high and low socioeconomic group.

**Table 3**  
**Prevalences and absolute differences for each country separately, adjusted for age. Odds ratios (95% CI). N = 77805**

Welfare regime	Country	Limiting longstanding illness						Fair/poor general health					
		Men			Women			Men			Women		
		Prev	RD	OR (95% CI)	Prev	RD	OR (95% CI)	Prev	RD	OR (95% CI)	Prev	RD	OR (95% CI)
Scandi- navian	Denmark	20.6	10.9	<b>1.37 (1.20 – 1.57)</b>	25.1	6.4	<b>1.39 (1.21 – 1.59)</b>	21.0	11.0	<b>1.41 (1.23 – 1.61)</b>	23.4	10.7	<b>1.47 (1.27 – 1.69)</b>
	Finland	29.5	7.1	<b>1.36 (1.21 – 1.54)</b>	29.7	6.8	<b>1.33 (1.18 – 1.51)</b>	34.9	15.2	<b>1.62 (1.43 – 1.84)</b>	32.7	9.4	<b>1.45 (1.28 – 1.66)</b>
	Norway	22.8	10.1	<b>1.35 (1.20 – 1.51)</b>	27.4	8.2	<b>1.31 (1.16 – 1.48)</b>	23.6	10.8	<b>1.45 (1.29 – 1.63)</b>	27.1	12.1	<b>1.55 (1.36 – 1.76)</b>
	Sweden	24.9	4.7	<b>1.20 (1.07 – 1.35)</b>	30.3	5.9	<b>1.25 (1.11 – 1.40)</b>	23.5	-2.1	1.09 (0.97 – 1.22)	28.5	12.1	<b>1.47 (1.30 – 1.67)</b>
Anglo- Saxon	Ireland	16.3	6.7	<b>1.33 (1.16 – 1.54)</b>	15.7	6.2	<b>1.32 (1.15 – 1.50)</b>	15.1	7.6	<b>1.40 (1.21 – 1.63)</b>	16.5	6.6	<b>1.31 (1.15 – 1.49)</b>
	United K.	24.2	5.1	<b>1.30 (1.15 – 1.48)</b>	24.0	5.5	<b>1.14 (1.01 – 1.29)</b>	26.4	10.2	<b>1.32 (1.18 – 1.49)</b>	26.9	6.8	<b>1.25 (1.11 – 1.41)</b>
Bism- arckian	Austria	21.9	2.8	1.10 (0.98 – 1.24)	24.4	7.1	<b>1.28 (1.14 – 1.45)</b>	21.5	4.2	1.11 (0.98 – 1.25)	26.7	5.1	<b>1.38 (1.22 – 1.55)</b>
	Belgium	19.9	6.6	<b>1.18 (1.04 – 1.34)</b>	20.9	4.3	<b>1.25 (1.09 – 1.44)</b>	21.0	10.0	<b>1.28 (1.13 – 1.45)</b>	25.2	10.0	<b>1.50 (1.32 – 1.71)</b>
	France	20.2	3.7	<b>1.31 (1.13 – 1.51)</b>	22.6	3.0	<b>1.22 (1.06 – 1.40)</b>	35.4	11.4	<b>1.32 (1.16 – 1.49)</b>	39.4	12.4	<b>1.41 (1.25 – 1.59)</b>
	Germany	26.1	3.6	<b>1.20 (1.09 – 1.32)</b>	27.0	6.8	<b>1.38 (1.25 – 1.53)</b>	38.6	5.7	<b>1.24 (1.14 – 1.35)</b>	39.9	7.7	<b>1.40 (1.28 – 1.53)</b>
	Luxembourg	19.7	7.9	<b>1.26 (1.08 – 1.45)</b>	16.3	6.3	<b>1.22 (1.03 – 1.46)</b>	32.2	15.9	<b>1.59 (1.40 – 1.81)</b>	39.8	11.7	<b>1.32 (1.17 – 1.49)</b>
	Netherlands	21.5	7.6	<b>1.27 (1.13 – 1.44)</b>	28.5	2.1	<b>1.16 (1.04 – 1.29)</b>	22.9	8.5	<b>1.36 (1.21 – 1.54)</b>	29.1	2.8	<b>1.15 (1.03 – 1.28)</b>
	Switzerland	18.6	5.1	<b>1.18 (1.04 – 1.34)</b>	19.6	0.4	1.12 (0.99 – 1.27)	14.5	5.5	<b>1.22 (1.06 – 1.41)</b>	17.3	5.5	<b>1.33 (1.16 – 1.53)</b>
Southern	Greece	14.3	6.2	<b>1.45 (1.26 – 1.68)</b>	21.6	10.8	<b>1.50 (1.31 – 1.71)</b>	19.3	9.7	<b>1.60 (1.40 – 1.83)</b>	28.9	14.4	<b>1.60 (1.42 – 1.81)</b>
	Italy	14.2	5.4	1.30 (0.96 – 1.75)	11.0	7.1	<b>1.51 (1.06 – 2.15)</b>	32.1	13.2	<b>1.40 (1.12 – 1.76)</b>	41.8	7.8	<b>1.22 (1.00 – 1.49)</b>
	Portugal	12.4	4.5	<b>1.54 (1.23 – 1.93)</b>	19.0	10.8	<b>1.96 (1.61 – 2.38)</b>	43.1	14.6	<b>1.58 (1.38 – 1.82)</b>	54.1	18.3	<b>1.55 (1.37 – 1.76)</b>
	Spain	13.8	7.7	<b>1.48 (1.22 – 1.79)</b>	18.4	8.8	<b>1.80 (1.49 – 2.18)</b>	33.3	5.6	<b>1.19 (1.04 – 1.35)</b>	40.6	11.1	<b>1.52 (1.33 – 1.75)</b>
Eastern	Czech R.	29.8	5.6	<b>1.13 (1.02 – 1.26)</b>	32.3	10.2	<b>1.37 (1.23 – 1.54)</b>	39.1	8.1	<b>1.23 (1.11 – 1.37)</b>	41.9	11.2	<b>1.43 (1.29 – 1.60)</b>
	Estonia	26.8	3.5	1.17 (0.99 – 1.40)	25.5	10.4	<b>1.57 (1.23 – 1.54)</b>	55.3	16.1	<b>1.53 (1.27 – 1.85)</b>	53.7	14.0	<b>1.56 (1.32 – 1.84)</b>
	Hungary	29.4	6.2	<b>1.27 (1.11 – 1.44)</b>	29.2	8.2	<b>1.37 (1.21 – 1.55)</b>	50.4	10.6	<b>1.46 (1.29 – 1.67)</b>	55.4	15.8	<b>1.71 (1.51 – 1.93)</b>
	Poland	29.5	10.6	<b>1.49 (1.31 – 1.71)</b>	31.5	10.9	<b>1.42 (1.24 – 1.63)</b>	44.7	13.9	<b>1.54 (1.36 – 1.73)</b>	53.6	16.6	<b>1.63 (1.43 – 1.86)</b>
	Slovakia	25.1	3.7	<b>1.26 (1.04 – 1.52)</b>	27.2	13.3	<b>1.45 (1.19 – 1.77)</b>	41.5	3.0	1.07 (0.90 – 1.27)	48.2	6.6	<b>1.26 (1.05 – 1.50)</b>
	Slovenia	34.8	7.1	<b>1.24 (1.08 – 1.41)</b>	34.6	13.9	<b>1.41 (1.23 – 1.62)</b>	40.6	15.6	<b>1.53 (1.34 – 1.75)</b>	51.3	17.0	<b>1.60 (1.41 – 1.83)</b>

**Prev** = age-adjusted prevalence of ill-health. **RD** = age-adjusted rate difference (percentage) between high and low socioeconomic group.

**Table 4<sup>a</sup>**

**The proportion of between-country variance in health measures that can be explain by the countries' grouping according to the Ferrera<sup>b</sup> welfare regime typology**

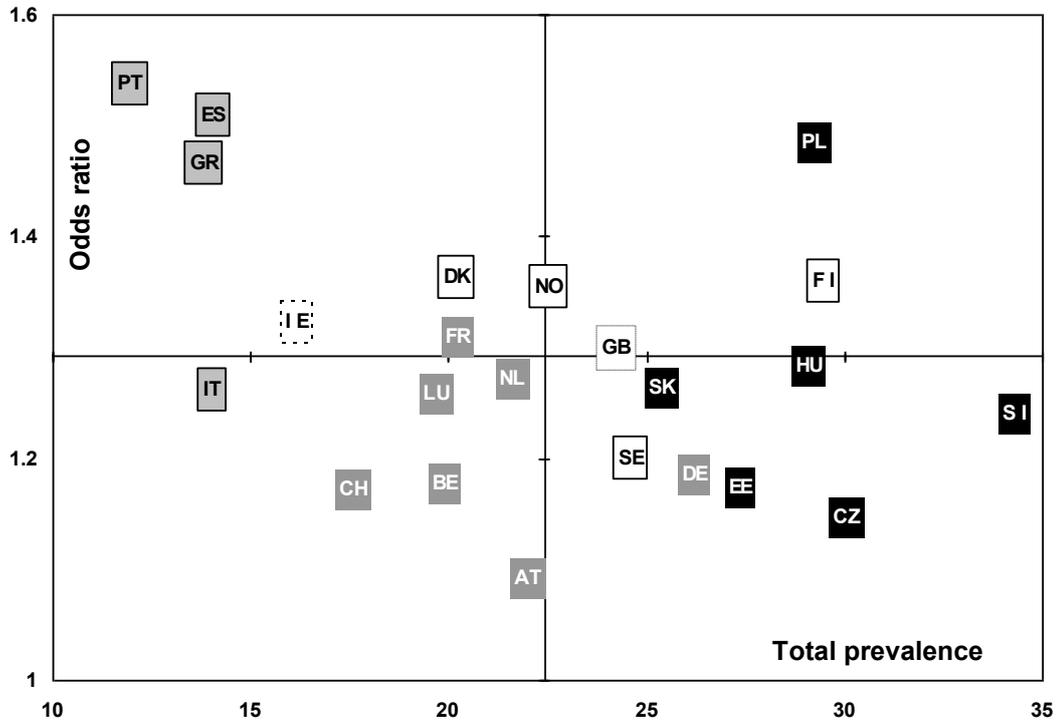
Statistical measure	Typology	Limiting longstanding illness		Fair/poor general health	
		Men	Women	Men	Women
		R <sup>2</sup> (sig)	R <sup>2</sup> (sig)	R <sup>2</sup> (sig)	R <sup>2</sup> (sig)
Overall prevalence	Ferrera	<b>0.788 (0.000)</b>	<b>0.640 (0.001)</b>	<b>0.595 (0.002)</b>	<b>0.689 (0.000)</b>
Absolute difference (RD)	Ferrera	0.194 (0.395)	<b>0.698 (0.000)</b>	0.062 (0.874)	0.409 (0.041)
Relative inequalities (OR)	Ferrera	<b>0.473 (0.016)</b>	<b>0.707 (0.000)</b>	0.090 (0.775)	0.355 (0.081)

<sup>a</sup> R<sup>2</sup> and significance were calculated on basis of one-way ANOVA tests. R<sup>2</sup> gives the percent of between-country variance explained and is calculated by dividing the between group sums of squares (SSb) with the total sums of squares (SS<sub>T</sub>).

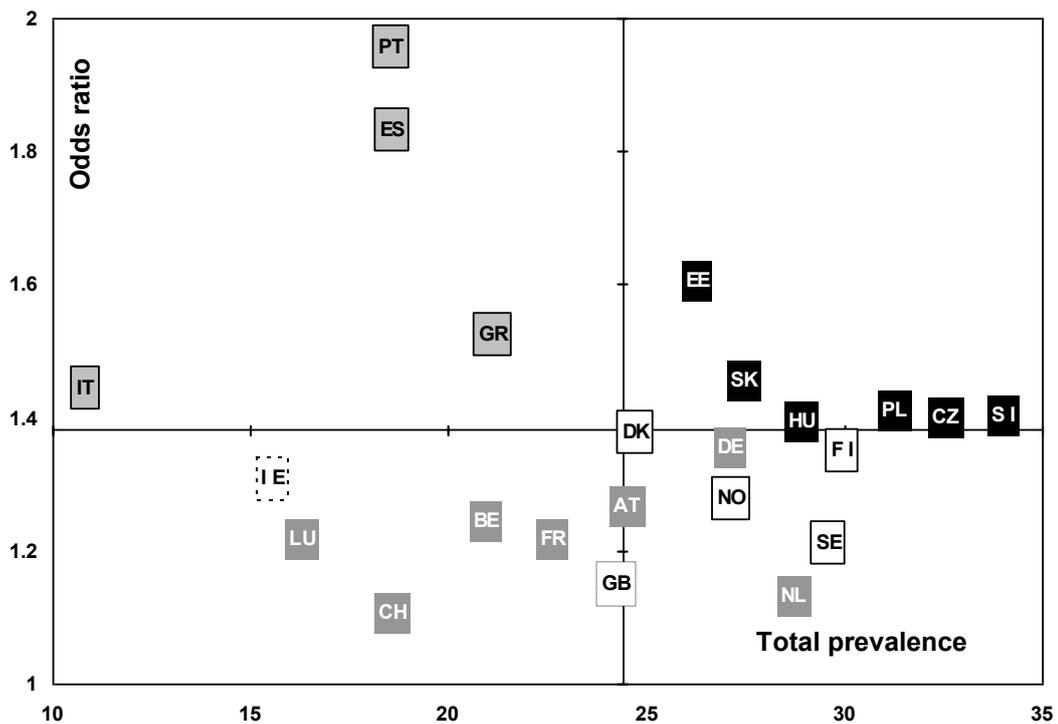
<sup>b</sup>*Ferrera*: Scandinavian (NO, SE, DK, FI), Bismarckian (AT, BE, CH, DE, FR, LU, NL), Anglo-Saxon (IE, UK), Southern (ES, GR, IT, PT), Eastern (CZ, EE, HU, PL, SI, SK).

**Figure 2:**  
**Odds ratios (Y-axis) and national prevalence rates (X-axis) for having limiting longstanding illness (self-reported) among European men and women.** Axes lines represent unweighted average values.

**Men**



**Women**



**Figure 3:**  
**Odds ratios (Y-axis) and national prevalence rates (X-axis) for having fair/poor general health (self-reported) among European men and women.** Axes lines represent unweighted average values.

