



Social protection, income and health inequities

Final report of the Task Group on GDP, Taxes, Income and Welfare

Review of social determinants of health and
the health divide in the WHO European Region







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Key recommendations

The degree of generosity of social protection policies influences the levels of health and health inequalities, most likely by reducing the risk of poverty and increasing the resources available to individuals and families. Countries with lower poverty rates also have lower mortality rates, and this relationship becomes stronger when the poverty threshold is set lower. Analysis indicates that social policies may deliver diminishing marginal returns, which means that the health gains from social policy programmes per unit of money spent are generally higher at lower levels. This suggests that even modest increases in social protection and cash transfers would be important in countries with lower income levels in the WHO European Region. Further, the impact of spending differs between educational groups, with the people with less education gaining more. This suggests clear potential for reducing health inequalities. Universal programmes and systems that include the majority of the population tend to be matched by higher generosity for benefits targeting people with low income. In addition, programmes and institutions that benefit women appear to be important.

The following general recommendations are based on evidence from the scientific literature and the results of this novel analysis.

1 Do something

In countries with low ambitions for social protection, some programme improvements would benefit public health and would reduce health inequalities.

2 Do more

In countries with medium or high ambitions in terms of social protection policies, raising these ambitions further would benefit health and health inequalities.

3 Do better

Among the most developed welfare states, investing in more social protection is probably not the only way to improve public health. However, where the redistributive and protective capacity of a welfare state has actually diminished, it would be beneficial to re-establish previous levels of social protection, both generally and, in particular, for the most vulnerable people. Growing inequalities in mortality and in income strongly suggest that how the resources already spent on social protection are used also needs to be improved. This also applies to the countries that spend less.

Executive summary

The main social determinants of health are synonymous with the welfare resources that are necessary to lead a good life. These include economic resources, working conditions, housing conditions, education and knowledge. The resources an individual can command may be strictly personal (such as knowledge or mental energy) or may be generated by the individual in the market (such as income or prestige) or through the family (such as family income, possessions or social relations). All such individual resources – personal, market or familial – are important for health and well-being. In addition, however, individuals can also draw on the collective resources provided by welfare state institutions.

More specifically, such resources include social insurance designed to cover income loss from illness, unemployment and old age (the cash side of the welfare state) as well as welfare services supplied free of user charges or heavily subsidized, such as childcare, health care and care for older people and people with disabilities (the care side). The supply and quality of such resources are likely to influence people's ability to sustain their health and well-being. Moreover, these collective resources are likely to be more important for people with lower incomes and poorer living conditions generated in the market and by the family. The less people have in individual resources, the more important it is that they be able to draw on collective resources. This implies that welfare policies that provide more generous transfer payments and better-quality services are likely to improve public health and reduce health inequalities.

Role of health and well-being

Of all the resources that are important for health and well-being, economic resources occupy a special position because they can easily be transformed into other types of resources. Income in general and poverty in particular are also clearly linked to a range of health outcomes through material, social and

mental factors. Policies that reduce the risk of poverty or, more generally, help to provide better family incomes are therefore likely to contribute to better public health.

Based on a strategic review of the literature and a series of novel analyses of European data, this publication addresses two key issues: the role of poverty for health and the role of social protection policies for health and health inequalities. As has been demonstrated earlier, lower poverty rates are associated with lower mortality across a range of European countries, both among young children and adults. The amount of social spending, a crude indicator of the generosity of social protection programmes, appears to influence this.

Social protection

This analysis of social protection policies looks at these, both as legislated social rights and as social spending. On the whole, the analysis supports the idea that higher degrees of social rights in a country are related to better self-rated health at the individual level when potential confounders have been controlled for. The positive impact of extensive social rights on health outcomes has been demonstrated for all vulnerable socioeconomic groups. Social rights in the form of cash transfers may therefore be viewed as a collective resource with important external benefits: benefits to society over and above those to unemployed people who directly use these transfers. Although specific programmes have a measurable, positive effect, it appears that the combination of more extensive social rights in several fields (labour market, family and old age) is important for public health.

These findings are reiterated in the analysis of social expenditure. Across 18 European Union countries, net of gross domestic product, social expenditure is associated with health inequalities for both sexes, although somewhat more consistently among women than among men. In particular, people with a lower level of education benefit

more from high social transfers than those with secondary and tertiary education. In both absolute and relative terms, educational inequalities in health decline as social spending rises.

However, the relationship between spending and entitlements and health is also curvilinear, with diminishing returns in terms of health at high levels of social spending and social rights. This suggests that the easiest gains can be made among the countries with the least developed social protection systems. Even small improvements in legislated social rights and in social spending are likely to lead to improved health, according to the results. Although the results invite the general conclusion that more should be spent on social protection to improve health and reduce inequalities, the results also suggest that this recommendation is especially relevant for countries with the lowest levels of social spending in the WHO European Region. Doing something in social protection policies is better than doing nothing, and even a small increase in social spending is likely to result in health gains.

Doing better

In recent years, both income inequalities and health inequalities have risen in countries with the most extensive welfare states. Where the redistributive and protective capacity of the welfare state has actually diminished, levels of social protection generally, and for the most vulnerable in particular, could well be improved again – hence, countries that already spend the most also have room for more spending on social protection. However, given the diminishing returns, simply investing in more social protection is probably not the only solution. Rather, there is room for improving existing social protection policies.

The research presented here does not identify specific policies that need reforming; however, the whole range of social protection policies analysed in this report could be reviewed in each country.

One counterargument to the conclusions and recommendations presented here is the situation in the Nordic countries, where health inequalities remain despite large welfare states and lower poverty rates. However, as demonstrated in this report, more generous and encompassing welfare policies, including social protection policies, seem to be important tools for tackling some of the key social determinants of health and health inequalities in all countries. Various forces generate inequalities in welfare resources and health, and inequalities in health would have been much greater without the welfare states that exist in the Nordic countries and other European countries.

Another counterargument is that the welfare state undermines productivity, efficiency and economic growth. The contention that there is a trade-off between efficiency and equality is often used to capture this view. Recent empirical and historical research contradicts this assertion, however; new findings rather indicate that large welfare states do not hamper economic growth. On the contrary, the welfare state may even increase economic wealth. This suggests that comprehensive welfare arrangements may foster economic growth, human well-being and social equality all at once. Hence, social protection and welfare state policies should be viewed as important investment that provides the social infrastructure necessary for high employment rates.

Introduction

An important starting-point for the work of Technical Group 4 of the European review of social determinants of health and the health divide is that the main social determinants of health also constitute the welfare resources necessary to lead a good life. These include economic resources, working conditions, housing conditions, education and knowledge. Such resources can be defined as "... the command over resources in terms of money, possessions, knowledge, psychological and physical energy, social relations, security and so on by means of which the individual can control and consciously direct her conditions of life" (Johansson, 1970, p. 25). The resources that an individual can command may be strictly personal (such as knowledge or mental energy) or generated by the individual on the market (such as income or prestige) or through the family (such as family income, possessions or social relations). All such individual resources – personal, market or familial – are important for health and well-being.

In addition, however, individuals can also draw on the collective resources provided by welfare state institutions. Such institutions are intended to assist citizens with "... the collective matters that arise from the demands and possibilities that all individuals in all

societies are facing during the life cycle" (Johansson, 1979, p. 56). More specifically, such resources include social insurance designed to cover income loss due to illness, unemployment and old age (the cash side of the welfare state) as well as welfare services supplied free of charge or heavily subsidized, such as childcare, health care and care for older people and people with disabilities (the care side). The supply and quality of such resources are likely to influence people's ability to sustain their health and well-being.

The supply and quality of resources more generally are key factors influencing public health. However, the collective resources provided by welfare policies are not only important in helping individuals sustain their health and well-being but are also directly controlled by parliaments and governments. Moreover, these collective resources are likely to be more important for people with lower incomes and poorer living conditions generated in the market and by the family. The less people have in individual resources, the more important drawing on collective resources becomes. This means that welfare policies that provide more generous transfer payments and better-quality services are likely to improve public health and reduce health inequalities.

Income as a key resource

Of all resources important for health and well-being, economic resources occupy a special position because they can easily be transformed into other types of resource. In work on the factors that help people to stay healthy, Antonovsky (1979, p. 106) starts with economic resources: "Access to money, the symbolic equivalent of resources, is, I suggest, an important [general resistance resource] in all societies Not only does money directly facilitate coping with stressors; but, linked to the acquisition of other [general resistance resources], it is also indirectly powerful."

Income is not only a central resource for ensuring good living conditions; it is also a central object for political interventions through a range of existing welfare state institutions and programmes that provide families and individuals with resources. A striking feature of high-income countries since the Second World War is the growth of such collective institutions that have important implications for people's access to valuable resources. Of central importance is the fact that social protection policies can create a buffer against income loss and can redistribute income, both over the life-course and between individuals



(Fritzell & Ritakallio, 2010). In addition, providing services at low cost or free of user charges, such as education and health care, plays an important role for health and well-being.

Further, income in general and poverty in particular are clearly linked to a range of health outcomes. Policies that reduce the risk of poverty or, more generally, contribute to better family incomes are therefore likely to help improve public health. Hence, income is an important nexus linking major policy tools with health inequalities through a key resource and social determinant of health on the micro level.

A range of conditions and processes influence the relationships between policies, family incomes and health. Macroeconomic processes affect the labour market and, in turn, employment and market incomes, tax revenue and thereby the economic basis for policies. Educational policies are of key importance for human capital and people's opportunities for gainful employment.

However, complex links and interdependence also exist within a more narrow focus. A generous social protection system requires high employment rates and high taxation levels. Social protection policies are not

merely costs; they are often important social investment that provides the social infrastructure necessary for high employment rates (Morel et al., 2012). Family policies, for example, can be designed to promote high labour market participation among women. This, in turn, affects family incomes as well as gender relations in the market and in the family.

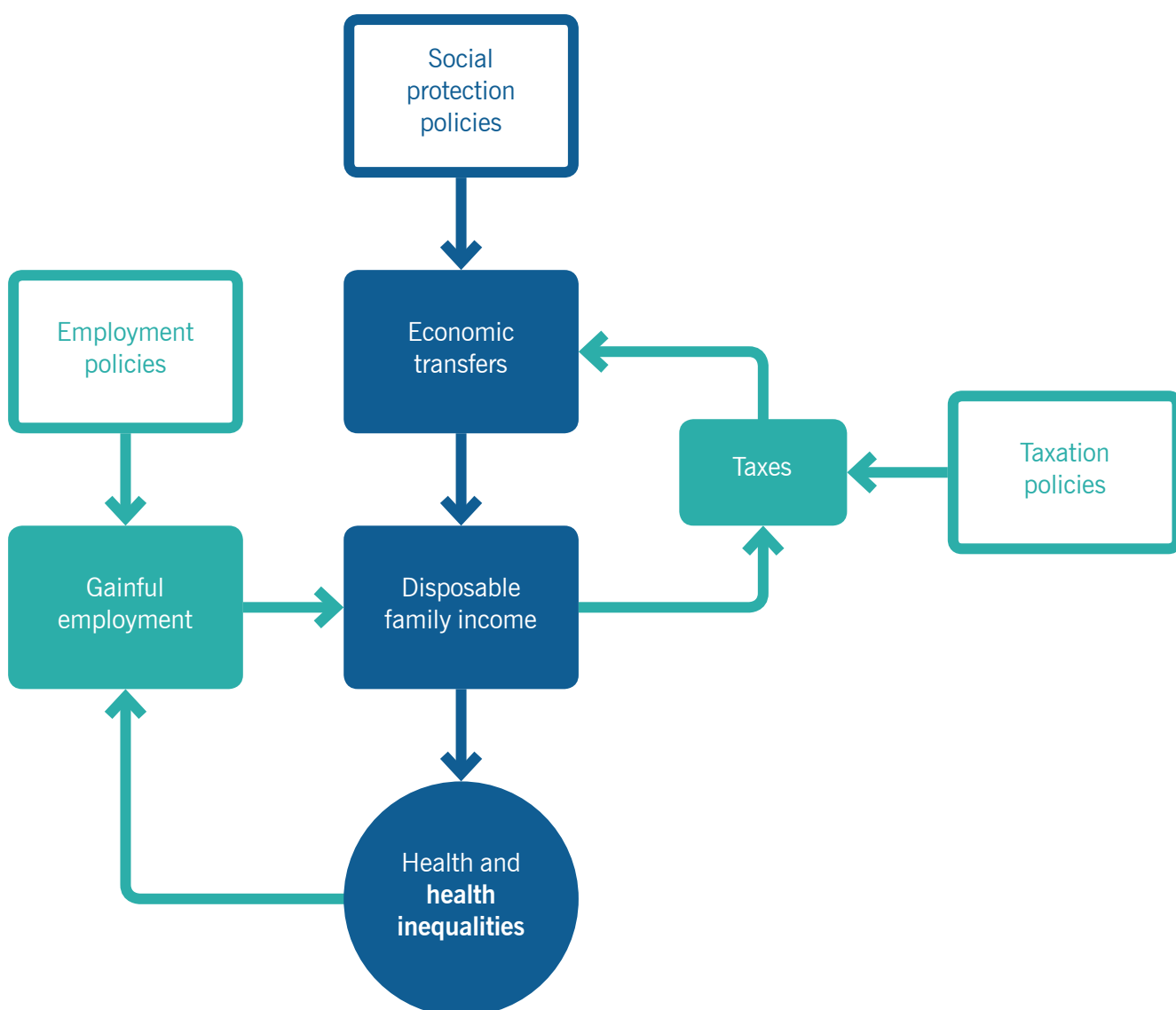
Social protection and welfare state policies are not only viewed as investment in a social infrastructure, however. In fact, a quite common argument has been that the welfare state undermines productivity, efficiency and economic growth. The contention is that there is a trade-off between efficiency and equality. Recent empirical and historical research contradicts this assertion, however. New findings indicate that extensive welfare states do not hamper economic growth. On the contrary, the welfare state may even increase economic wealth (Garfinkel et al., 2010; Lindert, 2004). This suggests that comprehensive welfare arrangements may foster economic growth as well as human well-being and social equality. One reason for this is that, when people's resources increase their sense of security, economic flexibility and stability, their willingness to take risks, well-being and social solidarity also improve.

Although all these links and interdependence are important for a person's opportunity to live well and be healthy, the strategic focus is on how social protection policies influence health through their influence on family incomes (Fig. 1).

The social protection policies that provide cash transfers largely insure against loss of income because of people's inability to participate in gainful employment. This inability, in turn, often arises from reduced health and/or functional ability as a result of injury, illness, disability or old age. The value of benefits in kind (or the care side of the welfare state) is also central and highly important. Health care provided free of user charges or training as part

of active labour market policies contributes to a social infrastructure that is likely to greatly influence public health and health inequalities. However, studying this infrastructure in terms of the economic value for families of these services is complicated, both conceptually and empirically. For example, adding the economic value of services to the income of the people who use them will produce a picture according to which terminally ill people, who depend on considerable expensive health care, would appear to be extremely rich. Nevertheless, although it is not directly presented in Fig. 1, the value of services that are free of user charges or strongly subsidized is important and is included in the analysis of social spending and health inequalities.

Fig. 1
Links between key policies, income and health



The model is formulated on the individual level. Although individual people become ill or die prematurely, they also live in families that reside in neighbourhoods that in turn are embedded in regions and countries. These layers of social, economic and physical context are certainly important. Indeed, the policies that are of interest here can all be regarded as part of the institutional context that differs across countries. Although the context, therefore, is at the heart of the matter, the effects of these contexts on the resources on which people and their families can draw when needed end up being most important for well-being, health and survival. In addition, there are important effects over and above the individual-level access to resources. Good education, good health care and generous unemployment benefits or child allowances are also valuable for people who are not

currently using these programmes and services. However, the general public good rests on the individual value. If services and transfer programmes are of poor quality for the people who need them, they will not provide security for other potential users either, and hence their public value will also be low.

Nevertheless, at the centre of these complex relationships are family incomes and their relationship to existing policy tools and to health outcomes. The core question for Technical Group 4 is, accordingly, how policies that support the generation and maintenance of family incomes in various ways can contribute to better health at the individual and societal level, and whether the policies that are most effective in doing this can be identified.

Beyond state of the art – important knowledge gaps

Understanding how income can contribute to better health could enable existing institutions and programmes that involve income redistribution to be designed (or redesigned) to improve public health in general and for lower-income groups in particular. Potentially important policies here include the whole spectrum of income transfer programmes as well as policies that provide resources indirectly, such as welfare services or education that is subsidized or free of user charges. However, despite the quite extensive literature about welfare states, social policies and poverty and the literature about income inequalities and health, important knowledge gaps still need to be filled.

Two main issues need to be addressed in the context of the European review of social determinants of health and the health divide.

- What is it about income that matters for health? Uncertainty as to whether income levels among poor people or income inequalities per se influence health and health inequalities (to take but two possibilities) will create difficulty in designing adequate policy responses.
- Can specific features of income maintenance policies across Europe that are linked to better health and smaller

inequalities be identified? Identifying certain designs or properties of social protection policies that are associated with better health and smaller health inequalities may enable effective policy reforms to be proposed.

Income and health from a policy perspective

Research into income and health has largely focused on the issue of whether income inequality as such influences health, independently of absolute levels of income or the proportion of poor people. There are many studies, and how to interpret their findings is highly debated. Where Wilkinson & Pickett (2006, 2009) find clear evidence for income inequality as such being the key driver behind health (and other) inequalities, others see merely methodological problems and highly mixed results (Deaton, 2003; Lynch et al., 2004). Further, most existing studies use a cross-sectional design only, and few have looked at effects on health inequalities (Kondo et al., 2009).

However, it can be argued that income redistribution will reduce health inequalities anyway as long as there is a monotonic and at least partly causal relationship between income and health at the individual level (Deaton, 2003; Ecob & Davey Smith, 1999;

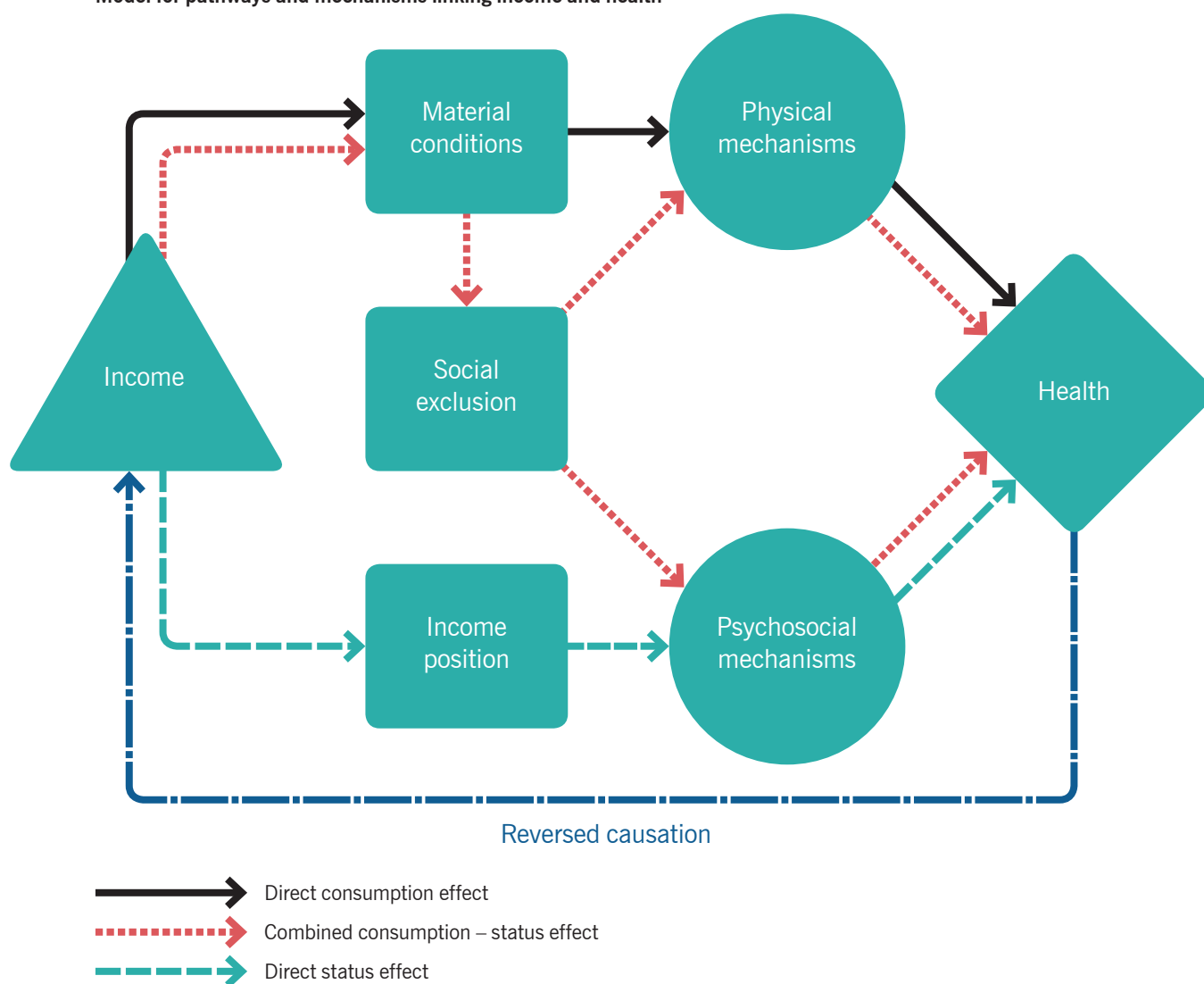
Fritzell et al., 2004; Mackenbach et al., 2005; Åberg Yngwe & Lundberg, 2007), and that at least part of the relationship is causal. Nevertheless, it is important to understand how such an effect is generated: in other words, which mechanisms are active.

Modern welfare states with high average incomes also probably have several pathways that link income to health (Lundberg et al., 2010). Income and economic resources are likely to influence health through material, social and mental factors in ways that are summarized in Fig. 2 (Fritzell et al., 2007; Marmot, 2004, 2005). The relative importance of the three pathways suggested here (direct consumption effects, direct status effects and combinations of these) is,

however, largely unknown. For example, if income ranking as such is highly important, compressing the income distribution would not greatly affect health inequalities, whereas the opposite is true if the distances between positions are also important.

Hence, the relationship between income and health is complicated and certainly not a simple issue of “more is better” but rather an issue of poverty as well as a gradient (albeit with diminishing returns). What is known and inconclusive about income as a social determinant of health therefore needs to be clarified. This is particularly the case for whether income distribution per se or poverty and purchasing power problems influences health and health inequalities.

Fig. 2
Model for pathways and mechanisms linking income and health



Source: Lundberg et al. (2010).

Role of social policy institutions

The numerous social determinants that are likely to influence health directly or indirectly are also linked to a range of policy fields, including economic policies, social policies, labour market policies, school policies and many others. Most of these types of policies and programmes have primary goals in terms of economic growth, employment and unemployment rates, return to work, poverty rates and so forth. Although all these factors and policies in these areas are likely to affect health, relating social policies to health is quite complex and even more complex for reducing health inequalities.

Early observers of health inequalities linked them to differences in poverty, food supply, housing and even anxiety and despair, and policies to eradicate such problems remain important for public health today. However, in modern welfare states in which these types of policies are generally in place, the key issue is the combination of the generosity and organization of policies, programmes and services: the institutional characteristics.

Recent years have witnessed an increase in attempts to more systematically study welfare states and public health. Some of these attempts have been built on existing approaches in the extensive welfare state literature, for example by applying the well-known typologies suggested by Esping-Andersen (1990) or typologies inspired by his work (Dahl et al., 2006; Espelt et al., 2008). Nevertheless, these attempts have produced varying results. Whether based on Esping-Andersen's three worlds of welfare capitalism or other principles for clustering countries, this approach suffers from the fact that most of the typologies were designed for other purposes. For one thing, they tend to be part of a scientific debate over the roots and driving forces behind the emergence of the welfare state and the reasons behind key differences: research that identifies the welfare state as the dependent variable rather than an independent variable. More specifically, this approach clusters countries in three, four or more groups of countries based on one key feature. For Esping-Andersen, this feature is usually the degree to which citizens are independent of the market for

their economic support (decommodification). Although this can influence health and health inequalities, several social determinants probably affect health and health inequalities rather than a single one. Typical features of poverty reduction may cluster countries nicely (at one point in time), but it does not follow that countries within clusters are similar in other ways, such as how health care is funded. Although welfare state arrangements are likely to be one important factor influencing health and health inequalities, drawing useful conclusions for policy change purposes is difficult based on research in which welfare states are grouped into broad and analytically imprecise national welfare clusters rather than according to the more precise mechanisms that produce these outcomes (Goldthorpe, 2010; Lundberg et al., 2010; Tapia Granados, 2010).

It has therefore been suggested that studies focus on the characteristics of institutions or what countries actually do, policy by policy (Lundberg, 2008; Lundberg et al., 2008a). However, the combined impact of policies and programmes as a whole also need to be studied. People who lack resources generated in the market or the family are likely to need support from a range of welfare state institutions such as unemployment insurance, sickness insurance and health care services. The design and properties of the whole range of policies can therefore be assumed to be important, and more important than the sum of the various institutions taken one by one. Further, the public policy system as a whole, or at least the beliefs about its features and the protection offered, is probably also significant for people who do not make use of transfers or services. Although the welfare regime approach may appear to be a response to the need for an assessment of the impact of all public policies taken together, it is actually not, since it in effect tends to aggregate all country-specific properties under the welfare regime heading. What is actually needed is a method that enables the direct and indirect effects of a range of policies and institutions for each country to be summarized. This publication uses two attempts to achieve this, incorporating both institutional characteristics and social expenditure.

Results and findings – income and health

The discussion about the effects of income for health and health inequalities has been intense but also somewhat confusing. Much of the debate has focused on whether or not income inequality per se influences people's health. This discussion has been propelled by the ideas of Richard Wilkinson, who initially raised income inequality as an important factor for population health. However, Wilkinson has shifted his position with regard to what income inequalities represent, from the proportion of relatively poor via social cohesion and finally to a proxy for social distances and social stratification. Defining income inequality clearly is essential, both for causal analysis and from a policy perspective. However, recognizing that income inequality is a reflection of individuals' (or households') incomes is even more important. Although the aggregate distribution of income may well affect individual health, it is also, and perhaps mainly, affected by factors at the individual level such as income. Thus, irrespective of whether it is income inequalities per se or only personal income that influence people's health, the effect is produced at the individual level. The mechanisms may be linked to purchasing power and consumption effects, social comparison and status effects or combinations of these, but the link between income (whether at the macro or micro level) and health is nevertheless evident at the individual level. (For practical and data-related issues, some of the analyses presented will nevertheless be performed on aggregated data.)

Several reviews of the literature (Furnée & Pfann, 2010; Furnée et al., 2011) have suggested that income is clearly related to health and mortality but that there are mixed results for any independent effects of income inequality (Kondo et al., 2009; Lynch et al., 2004; Rowlingson, 2011; Wilkinson & Pickett, 2006). Although income inequality may or may not be a social determinant of

health, larger income disparities are directly related to higher relative poverty rates. Although the worst consequences of poverty such as famine and extremely poor living conditions have become marginal problems at least in the high-income countries in Europe, the lack of economic resources is still a potent determinant of health everywhere (Glennerster et al., 2009). One of the traditional key differences between approaches to social protection and welfare policies is also their differing ability to reduce poverty rates (Fritzell & Ritakallio, 2010).

Nevertheless, few studies have directly investigated the role of relative poverty when studying cross-national variation in population health. The role of welfare state programmes for population health has recently been highlighted. Especially within the NEWS project (Lundberg et al., 2008a), initiated in collaboration with the WHO Commission on Social Determinants of Health, several studies were produced linking specific designs, generosity and coverage of social policy programmes to overall and age-specific mortality as well as morbidity (Esser & Palme, 2010; Ferrarini & Norström, 2010; Kangas, 2010; Lundberg et al., 2008b; Norström & Palme, 2010). These studies focused on the cash side of the welfare state and supported the idea that more generous programmes influenced public health during the second half of the 20th century, at least for infant and old-age mortality. Although the mechanisms involved were not studied directly, it was argued that better economic resources among broad groups of society and more effective poverty alleviation were key factors.

This publication explores the poverty argument directly by making use of the best sources for comparative studies of poverty and mortality over a 25-year period. Because the problem of small sample size occurs in most cross-national studies, this problem has been overcome somewhat by using multiple waves of data for each country included.



Poverty and mortality¹

This analysis adopts a social policy perspective towards income inequalities and focuses on relative poverty to address the general issue of how income affects health. One important reason for this is that reducing poverty is an overarching goal for social protection policies, which therefore often target income protection during periods of life or situations during which individuals' ability to support themselves in the market is limited (such as during childhood or old age or when they are sick or unemployed). Another reason is that relative poverty rates are highly empirically correlated with measures of income inequality, and analysing one means also analysing the other.

The question then is how to define and measure relative poverty. In the European Union (EU) context, a commonly used definition of relative poverty is that individuals

are poor (or "at risk of poverty") if their equivalized² disposable household income is below 60% of the national median. Although the poverty threshold (60%) determines the proportion of poor households, the nature of poverty in terms of both income and its consequences become more severe and more absolute as the income gets further away from the national median. This analysis used both a 60% and a 40% poverty cut-off, which produce very similar results. The results presented below are based on the more severe definition, where poverty is defined as 40% of the national median.

Poverty rates are calculated from the Luxembourg Income Study (LIS) waves around 1980, 1985, 1990, 1995, 2000 and 2005, separately for children and for adults. Age-standardized mortality rates are calculated by using the Human Mortality

¹ This section is based on a paper by Johan Fritzell, Olli Kangas, Jennie Bacchus Hertzman, Jenni Blomgren and Heikki Hiilamo and on: Fritzell J, Kangas O, Bacchus Hertzman J, Blomgren J, Hiilamo H. Cross-temporal national poverty and mortality rates among developed countries. Amsterdam: Amsterdam Institute for Advanced Labour Studies; 2012 (GINI Discussion Paper 64); and Fritzell J, Kangas O, Bacchus Hertzman J, Blomgren J, Hiilamo H. Cross-temporal and cross-national poverty and mortality rates among developed countries. *J Environ Public Health*. 2013;2013:915490.

² Equivalized disposable income is the household's total (after tax and transfers) income divided by an equivalent scale in which household members can be given different weights. This procedure is used to account for the size and composition of the household as well as economies of scale. The actual weights used in an equivalence scale may differ; here the square root scale is used, which means that each household's disposable income is divided by the square root of the number of people in the household. Although the choice of equivalence scale can affect who is regarded as being relatively poor, it has less influence on the issue at stake here: changes over time and differences between countries (Fritzell & Ritakallio, 2010).

Database (see Annex 2). These calculations use the direct method for age standardization and the European standard population (http://www.euphix.org/object_document/o5338n27620.html). To allow for exposure time on mortality after the poverty measurements and to get more stable results (but avoiding overlap with subsequent poverty measurements), the adult mortality rates are calculated as the average of the age-standardized mortality rates of the LIS year plus that of the three following years (in total four years). Logged mortality rates are used to normalize the skewed mortality data.

The method used is pooled cross-sectional time series analysis. The analysis also

controlled for gross domestic product (GDP) per capita, data wave and social spending (see Annex 2).

Mortality among children younger than five years

Fig. 3 presents bivariate scatterplots on relative poverty rates and mortality among children younger than five years in the six waves of data. Although the raw associations are in the expected direction, that is, in all the studied waves, relative poverty and child mortality are positively related, they are not particularly strong. But to what extent is then relative poverty among children linked to mortality when other factors have been controlled for?

Fig. 3

Age-standardized mortality rates (deaths per 1000 person-years) among children younger than five years by child poverty rates, selected European countries, 1980–2005

Luxembourg Income Study wave 1=1980 wave 2=1985 wave 3=1990 wave 4=1995 wave 5=2000 wave 6=2005

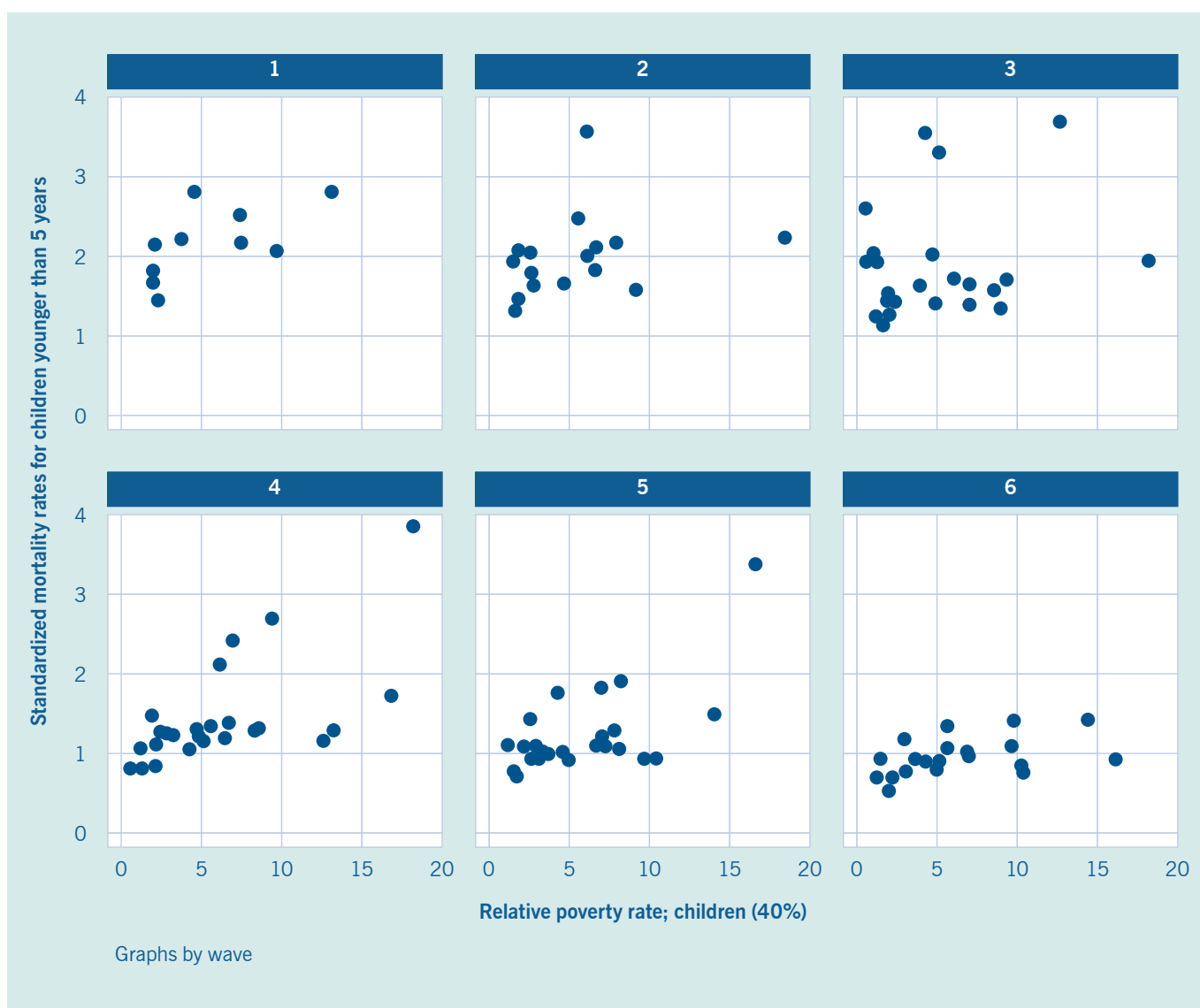


Table 1 presents stepwise regression models. The first model only controls for LIS wave (the trend variable). The coefficients for the association between poverty and mortality for girls and boys are highly significant. The basic results do not change when GDP per capita is included (second model). Adding social spending to the third model erodes a great deal of the poverty estimate, but it remains significant for both girls and boys. It also shows that, the higher the share of social spending as a percentage of GDP, the lower the mortality.

The statistical explanation for the strong attenuation of the poverty estimate when social spending is added is the strong association between social spending and poverty rates. Thus, the welfare state seems to influence relative poverty, and relative poverty influences child mortality. This main rationale of the story remains relatively robust regardless of which countries are included or excluded. However, the Russian Federation is special. When the Russian Federation is excluded, the poverty estimate is attenuated

by about one third across all models and for both sexes. The effects across all models are very similar for girls and boys, which seems intuitively correct. The poverty estimate also remains essentially the same when girls and boys are combined. The results from models with infant mortality as the dependent variable, instead of mortality of children younger than five years, also give a very similar picture.

The coefficient of the association between poverty and logged mortality rates from model 2 can be interpreted as follows: an increase in child poverty of one percentage point corresponds to approximately a 2.2% increase in child mortality among girls and, correspondingly, a 2.4% increase among boys. Since the average age-standardized child mortality rates in these data were 1.46 deaths per 1000 person-years among girls and 1.58 among boys, the lives of more than three girls per 100 000 and close to four boys per 100 000 would be saved by reducing poverty by one percentage point.

Table 1
Logged age-standardized mortality of children younger than five years in relative poverty (40% below median income), girls and boys

Girls	Model 1		Model 2		Model 3	
	Coefficient	<i>P</i>	Coefficient	<i>P</i>	Coefficient	<i>P</i>
Constant	0.85	<0.0001	1.05	<0.0001	1.34	<0.0001
Poverty	0.02	0.007	0.02	<0.0001	0.01	0.03
Wave	-0.17	<0.0001	-0.14	<0.0001	-0.13	<0.0001
GDP (thousands of US dollars)			-0.01	<0.0001	-0.01	<0.0001
Social spending					-0.02	<0.0001

Boys	Model 1		Model 2		Model 3	
	Coefficient	<i>P</i>	Coefficient	<i>P</i>	Coefficient	<i>P</i>
Constant	0.94	<0.0001	1.13	<0.0001	1.43	<0.0001
Poverty	0.03	0.001	0.02	<0.0001	0.01	0.03
Wave	-0.19	<0.0001	-0.15	<0.0001	-0.15	<0.0001
GDP (thousands of US dollars)			-0.01	<0.0001	-0.01	<0.0001
Social spending					-0.02	<0.0001

Table 2

Logged age-standardized mortality of adults 25–65 years old in relative poverty (40% below median income), women and men

Women	Model 1		Model 2		Model 3	
	Coefficient	<i>P</i>	Coefficient	<i>P</i>	Coefficient	<i>P</i>
Constant	1.14	<0.0001	1.39	<0.0001	1.55	<0.0001
Poverty	0.02	0.01	0.01	0.004	0.007	0.003
Wave	-0.07	<0.0001	-0.04	<0.0001	-0.03	0.001
GDP (thousands of US dollars)			-0.01	<0.0001	-0.01	<0.0001
Social spending					-0.01	<0.0001

Men	Model 1		Model 2		Model 3	
	Coefficient	<i>P</i>	Coefficient	<i>P</i>	Coefficient	<i>P</i>
Constant	1.90	<0.0001	2.30	<0.0001	2.53	<0.0001
Poverty	0.03	0.06	0.01	0.08	0.01	0.10
Wave	-0.09	<0.0001	-0.03	0.002	-0.01	0.28
GDP (thousands of US dollars)			-0.02	<0.0001	-0.02	<0.0001
Social spending					-0.01	0.01

Adult mortality

Adult poverty and mortality can be analysed following the same logic as in the analysis of child mortality, with the results presented separately for women and men (Table 2).

Although the coefficients across all models are very similar for women and men, the coefficients for men are not significant using standard levels of significance. Once again, social spending erodes much of the poverty effect. To test sensitivity, the analysis was rerun, this time excluding countries with less than three waves of data (Estonia and Slovakia) and the special cases of Taiwan (China) and the Russian Federation. Excluding these four countries, the poverty estimates

become nonsignificant. This effect can almost exclusively be attributed to the Russian Federation.

In summary, then, the relative poverty rates seem to influence the mortality of children younger than five years in the sampled countries and during the time period under scrutiny. It also seems perfectly plausible from a life-course perspective that relative poverty more instantly affects child mortality than adult mortality. The mortality risks for adults are also affected by circumstances during earlier phases of life. The findings are in accordance with earlier income inequality and mortality associations that have identified more consistent relationships between child mortality and inequality (Lynch et al., 2001).

Results and findings – social protection policies and health

As discussed above, a growing interest in the wider causes of the causes, or social determinants of health, has fostered an interest in social policies and welfare states. However, as cross-national comparisons of health inequalities show, there is no simple one-to-one relationship between the type of welfare state and the magnitude of the inequalities. Nevertheless, evidence indicates that lower poverty rates and more generous welfare policies are linked to better health, which indicates the need for more in-depth studies of welfare policies and their consequences for health and health inequalities.

A growing body of literature addresses these issues in one way or another. Several systematic reviews of population health, health inequalities and welfare state have been published. Beckfield & Krieger (2009) reviewed 45 studies addressing the relationship between determinants of policy and health inequities. These fell into four categories: transition from command to capitalist economy, neoliberal restructuring of economic regulations, welfare states and welfare regimes and the political incorporation of subordinated groups (Beckfield & Krieger, 2009, p. 155). The welfare state studies comprised about half of this literature. Eleven of these studies (from Europe and the United States) focused on welfare state policies outside the health domain. Five of these offered “suggestive” evidence that strong welfare states and generous social policies can dampen health inequalities (p. 157). The findings of the remaining six were more mixed, or in the authors’ own words (p. 167): “... within wealthy nations, the association between the type of welfare state and the magnitude of health inequities appears to be weak, especially for education-based inequity; ...”.

A systematic review by Muntaner et al. (2011) found 75 studies of the relationship between the welfare state and population health and health inequalities. They identified four paradigms: welfare regimes and democracy and the emerging themes of political tradition and globalization. Of these 75 studies, 31 address welfare state and population health and/or health inequalities (p. 950), with the majority (20) applying a regime approach (p. 952). For empirical results, the authors report that about 60% of the welfare regime studies found that social democratic regimes positively affect population health but that the association with health inequalities was more mixed (Muntaner et al., 2011, p. 954): “... more than any other political theme, approximately a third of welfare state studies (11 studies, 35.5%) reported inconclusive and contradictory associations regarding its effect on reducing of social class inequalities in health”.

Brennenstuhl et al. (2012) also synthesized available studies of welfare regimes, population health and health inequalities. They identified 10 studies of health inequalities. All focused on morbidity, mostly self-rated health and self-reported illness. The authors state (Brennenstuhl et al., 2012, p. 3): “A second conclusion of our study is that there is little support for the hypothesis that socioeconomic inequalities in health are smaller in social democratic regimes than they are in other regime types.” They also concluded that a more focused approach, analysing policy content, is called for.

Social rights and self-rated health³

Social policies should be addressed more directly than via welfare regime clusters. This requires using either data on legislated social rights or data on social spending. Because both these approaches have their strengths and weaknesses, both were used. Starting with social rights, family policy, sickness, disability and unemployment benefits and minimum income protection policies (social assistance) are the key social protection policies for adults.⁴ To construct a single measure of the level of social rights, each of the above benefit-level indicators has been standardized according to the highest value. The analysis presented here uses individual-level data from 23 countries⁵ from the EU statistics on income and living conditions (EU-SILC) 2006. The analysis is restricted to the core working age population 25–54 years since the institutional measures refer to benefits for the population of working age.

³ This section is based on an unpublished paper by Tommy Ferrarini, Kenneth Nelson and Ola Sjöberg.

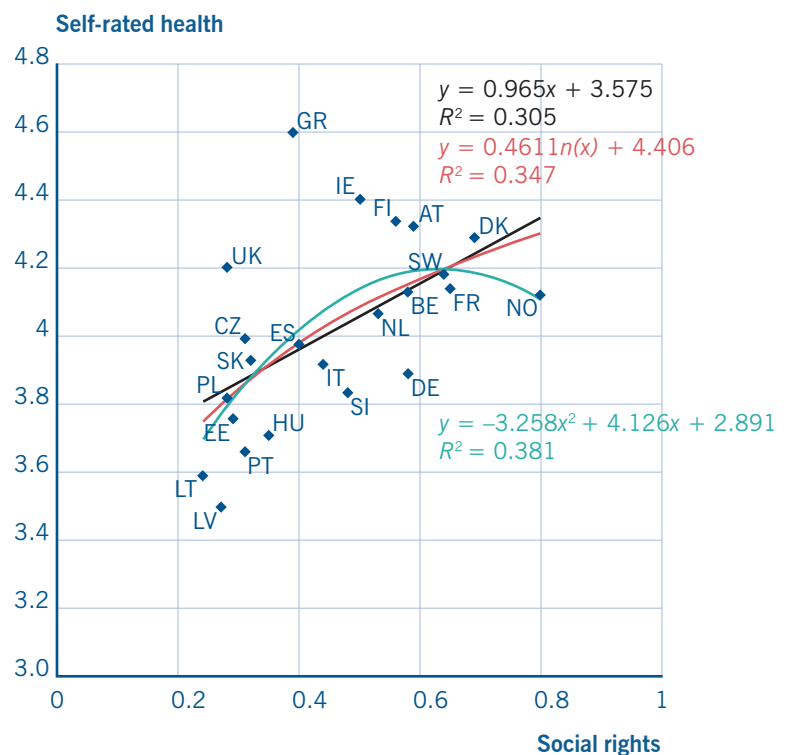
⁴ Data on social rights in the form of state-legislated family policy, sickness and unemployment benefits are from the Social Citizenship Indicator Program (SCIP). For each of these programmes, the benefits (for single people and families) after taxation are calculated at the level of an average wage and then expressed as the ratio between the net benefit and the after-tax wage. The data on disability benefits are from Palme et al. (2009) and coded with similar principles as in SCIP, assuming 100% work incapacity. Indicators on minimum income protection are from the Social Assistance and Minimum Income Protection Database (SaMip) (Nelson, 2007). Since minimum income benefits are not intended to provide income security for losses in work income but are used to mitigate low income and poverty, benefits are in this case standardized across countries by using Eurostat purchasing power parity. Information about countries and programmes not covered by the above-mentioned databases has been collected and harmonized to allow cross-country comparisons using MISSOC (2010), the OECD Tax Database and national sources.

⁵ Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

⁶ The equation for the trend line with a quadratic term is: self-rated health = 2.89 + 4.13*(social rights) – 3.26*(social rights)²; $R^2 = 0.38$, and the equation for the trend line with the natural log of social rights is: self-rated health = 4.406 + 0.4615*ln(social rights), $R^2 = 0.35$.

Fig. 4 displays the cross-national bivariate relationship between social rights and self-rated health, with the latter measured as a continuous variable (1–5, where 5 denotes “very good” health). Country abbreviations in the graph are the Internet suffix of the respective country. There is an overall positive but weak relationship between social rights and self-rated health ($r = 0.55$; $P = 0.006$). However, this relationship depends to some degree on the difference between the welfare states in the western part of the European Region and the countries in the eastern part of the Region in levels of social rights and subjective health. In fact, taken together, the relationship between social rights and absolute levels of health appears to be curvilinear. Trend lines including a quadratic term of social rights or the natural log of social rights, reflecting diminishing marginal benefits of social rights on health, both display better fit to the data.⁶ A stratified analysis, separating countries with low levels of social rights (countries in the eastern part of the European region together with Greece, Spain, Portugal and Great Britain) from the welfare states in the western part of the European Region, supports the notion that the effect of social rights on subjective health is curvilinear.

Fig. 4
Social rights and self-rated health in selected European countries



The effect of social rights is strongly positive at low levels of this variable but decreases and becomes weakly negative at the highest levels of social rights.

Two other health measures are also available in the EU-SILC: first, the respondent's self-assessment of whether he or she is hindered in the daily life by any ongoing physical or mental health problem or illness and, second, whether the respondent suffers from any chronic (longstanding) illness or health condition. No significant association emerges between the social rights index and these two health measures. The fact that social rights measured this way do not seem to be related to these other dimensions of health could indicate that variation in self-rated health across countries to some extent captures variation in other aspects of life, such as general well-being. Moreover, for the separate benefit programmes, the association between health and social rights is most apparent in connection with minimum income protection, which is probably related to the benefit-level measurement. Since the level of minimum income benefits here is standardized across countries using purchasing power parity (PPP), cross-country variation on this dimension to some extent relates to the level of economic development. Thus, some of the association between the level of minimum income protection and health probably results from differences in GDP across countries. However, although there is less correlation between the other parts of the social rights index (family benefits, sickness benefits, unemployment benefits and disability benefits), there is a clear association between an index consisting of all the latter components (the social rights index minus minimum income protection) and self-rated health. Thus, for a more general outcome such as self-rated health, the totality of social protection and social rights appears to matter rather than their specific components.

Although it is argued here that income as such, through the effects of direct consumption, independently affects individual health, much of the association

between income and ill health also probably reflects more fundamental systems of social stratification in society, such as social class, sex, education and ethnicity (Goldthorpe, 2010). Fig. 5–8 depict simple bivariate relationships between self-rated health (measured on a continuous scale) and social rights, with the sample stratified according to the following stratification dimensions: socioeconomic position and education (primary versus tertiary education), sex (men versus women), ethnicity (born in the country of the interview versus immigrants) and labour market status (economically active versus unemployed).

Fig. 5 indicates that, cross-nationally, the effect of social rights on self-rated health does not differ much according to sex: although men show slightly higher levels of self-rated health in all but three countries (Austria, Estonia and Finland), the positive correlation between social rights and self-rated health across countries is of about the same magnitude for both men and women.

Fig. 5
Self-rated health and social rights among men and women

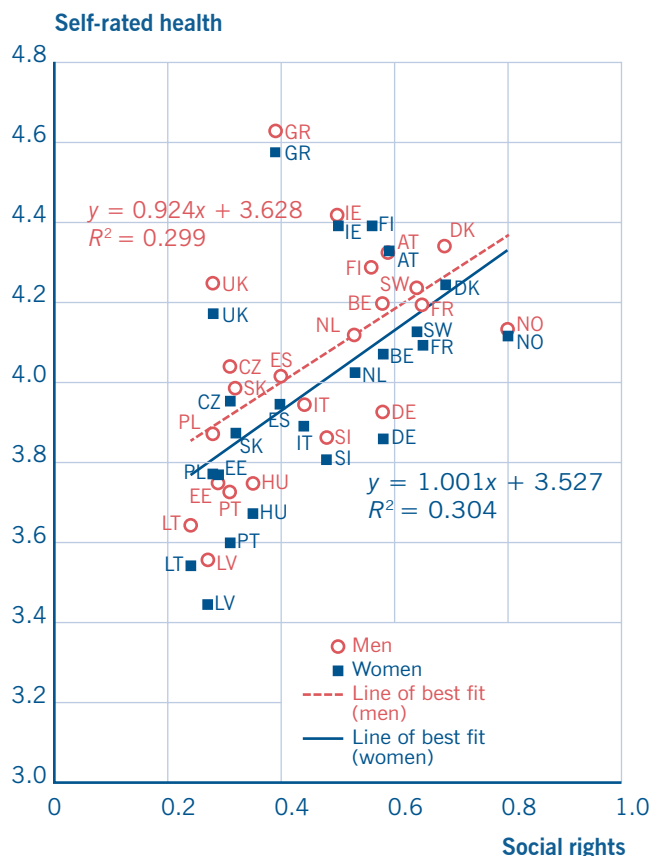


Fig. 6, which depicts the cross-national relationship between the level of social rights and self-rated health for respondents born inside and outside the EU, respectively, indicates that the effect of social rights differs according to this background characteristic: it appears to be stronger for those born inside the EU than for those born outside the EU. The same basic pattern is also apparent when the sample is stratified according to labour market status (Fig. 7) and education (Fig. 8): although the extent of social rights clearly affects the subjective health of both unemployed individuals and those with lower educational attainment across countries, this effect appears to be even stronger for economically active respondents as well as for respondents with tertiary education.

Evaluation of the effects of social rights in social subgroups shows that more extensive social policies are linked to higher self-rated health. These results remain robust when other macro-level factors are introduced into the analysis, such as national income, the extent of public services, the shape of income

Fig. 6
Self-rated health and social rights among native-born people and respondents born outside the EU

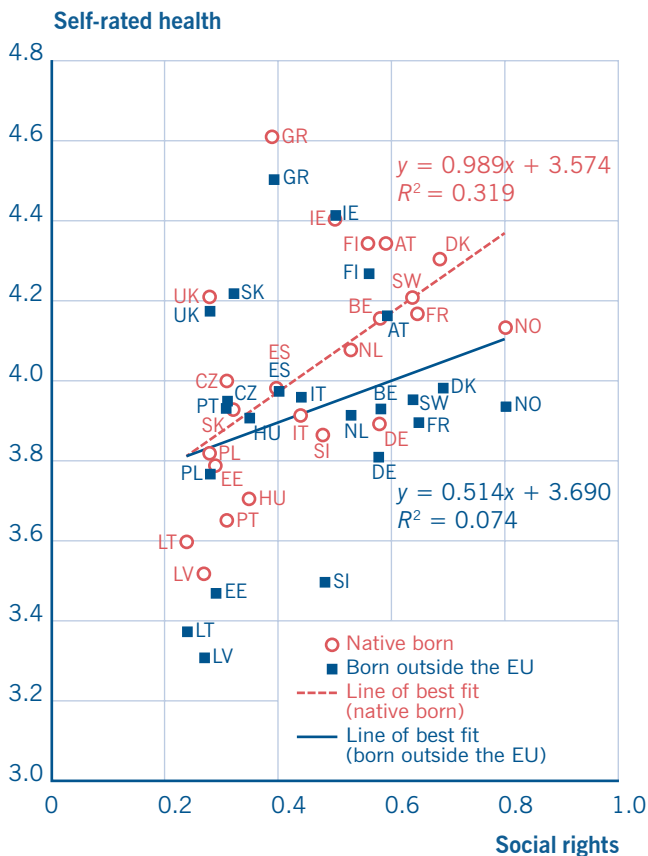


Fig. 7
Self-rated health and social rights among economically active people and unemployed people

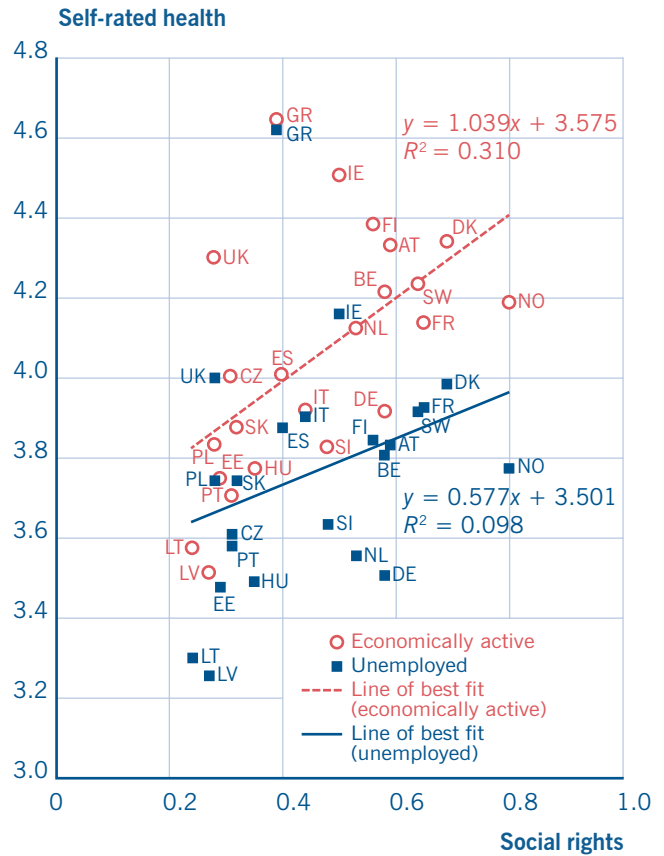
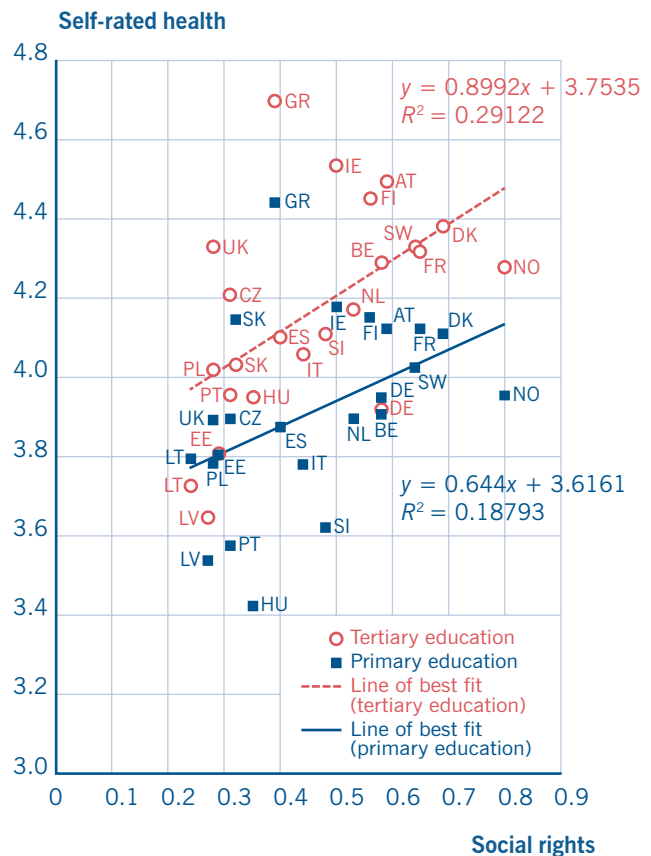


Fig. 8
Self-rated health and social rights among people with primary versus tertiary education



distributions, employment patterns and life expectancy as well as individual-level confounders.

However, findings also suggest that social rights in the form of generous cash transfer systems are as important, or perhaps even more important, for the subjective health of highly educated Europeans with stable employment as they are for citizens in weaker socioeconomic positions. These results indicate that social rights in the form of cash transfers may be viewed as a collective resource with important external benefits: benefits to society over and above those to the unemployed people who directly use such transfers (Sjöberg, 2010). Nevertheless, extensive social rights positively affect health outcomes for all vulnerable socioeconomic groups. One conclusion from the analysis presented here is that a broader range of institutional social rights indicators sometimes may better explain more general outcomes such as self-rated health than indicators of individual policies that capture social rights targeted at specific social risks or specific parts of the life cycle.

On the whole, the multilevel analysis carried out in this empirical section supports the idea that higher degrees of social rights in a country are related to improved self-rated health at the individual level.

Social spending and health⁷

An alternative approach is to use social spending to identify the ambition and generosity of welfare states. A common criticism of the use of spending data is that they reflect a combination of legislated rights (the ambition of the welfare state) and the needs in the population, such as the proportion of older people or the unemployment rate (Kangas & Palme, 2007). For example, spending on unemployment benefits may increase during a recession, even if the benefits become less generous (which is not unusual as expenditure increases). From this perspective, the social rights approach is preferable.

⁷ This section is based on an unpublished paper by Espen Dahl and Kjetil van der Wel and on: Dahl E, van der Wel K. Educational inequalities in health in European welfare states: a social expenditure approach. *Soc Sci Med.* 2013;81:60–9.

However, the social expenditure approach can also be theoretically justified with regard to the notion of command over resources discussed earlier. In terms of public health, welfare resources are associated with the social determinants of health, such as power, status, knowledge, work, income, social networks and general living conditions (Link & Pheland, 2010; Lundberg et al., 2008a). Lundberg et al. (2008a, p. 63) argue: “Since poverty and income are often seen as crucial factors influencing health, and since a general feature of welfare state programs is to create a buffer against income loss and to redistribute income both over the life course and between individuals, we obviously have one general path how welfare states might affect population health.” Money is normally easily converted into numerous health-enhancing resources. Income transfers may reduce susceptibility, prevent or reduce exposure to health risks like poverty and positively influence the social consequences of disease and illness (Lundberg et al. 2008a, pp. 15–17).

Since economic resources strongly influence the ability of individuals and families to lead good and healthy lives, the collective resources distributed by welfare state institutions are crucially important for groups and situations with insufficient individual resources. Collective welfare resources – in cash and in kind – may thus affect the distribution of ill health per se and the social consequences of ill health such as non-employment. Government provision of compensatory welfare resources is thus likely to result in better population health and smaller health inequalities and enhance social integration and participation among disadvantaged groups. Since the social expenditure figures can be adjusted to need, such data can be seen as a good indicator of the value of the collective resources provided by the welfare state. Hence, the resource perspective leads to the empirical expectation that generous and comprehensive welfare provisions give disadvantaged groups access to resources in cash and in kind in a compensating way and that these resources will influence the social determinants of health towards improving health, especially among people with fewer individual resources.



However, exactly what kinds of expenditure should be included and how expenditure should best be expressed in comparative studies are not entirely clear. For this reason, the present analysis used four ways of operationalizing welfare resources in terms of social spending. These four measures of spending are intended to measure different aspects of generosity: the economic resources provided for each individual by the state and (for some measures) also by private actors (Gilbert, 2009). The analysis first differentiated between gross public social expenditure and net total social spending. The former is the summed costs for a range of public social protection programmes (including those related to old age, survivors, disability, health, family, active labour market policies, unemployment and housing benefits); the latter also includes gross voluntary private expenditure, and the value of tax breaks has been added and paid indirect and direct taxes have been subtracted (Adema & Ladaique, 2009). Both of these measures were then calculated as a percentage of GDP and the value per capita in United States dollar purchasing power parity.

All four measures of social spending were also adjusted for need, defined as the dependency ratio for each country. The dependency ratio was calculated as the ratio between all employed individuals (total employment

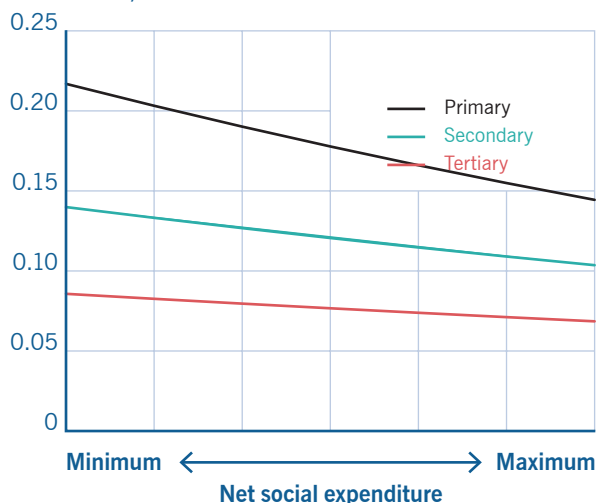
in thousands from OECD Annual Labour Force Statistics) and the total population (population dataset). This expresses the proportion of the population without income from the labour market that therefore needs state transfers (or other kinds of provision). The justification for adjusting all expenditure data with the dependency ratio is that social expenditure per se is driven by both social rights and need (Castles, 2004, p. 82; Gilbert, 2009, p. 361; Kangas & Palme, 2007, pp. 106–109). Since net spending as a proportion of GDP and net spending per capita (in PPP) are likely to more accurately capture the resources each person in need actually has at his or her disposal, the presentation focuses on these two ways of reflecting social expenditure. The relationship between social spending and health is fairly similar for all four measures.

All models were estimated by random intercept multilevel logistic regressions separately for men and women. At the individual level, the focus is on education, but age, country of birth, marital status, immigrant status and employment status were entered as control variables. At the country level, the social expenditure variable is included along with GDP per capita as a control variable. Of main interest are the interaction terms between education and social expenditure.

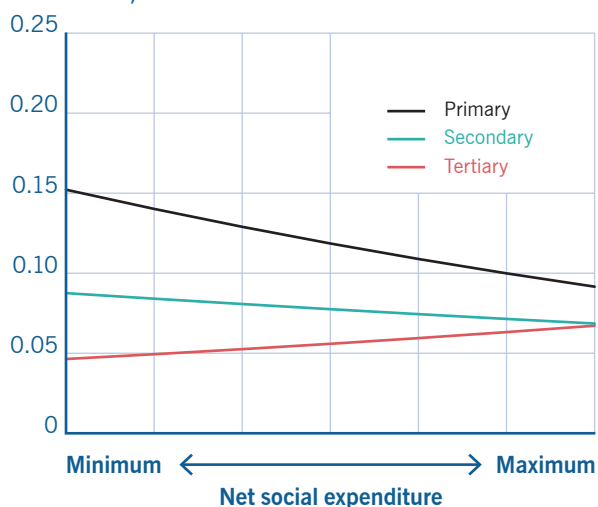
Fig. 9
Associations between social expenditure and poor self-rated health by educational group for men and women

The predicted probabilities have been estimated from model 2, Table 3 in the paper by Dahl & van der Wel for net total social expenditure (PPP).

Predicted poor self-related health, men



Predicted poor self-related health, women



Results

A clear pattern emerges in the effect modification of educational effects by social expenditure, particularly among those with primary education and secondary education. For all four measures of social expenditure, the likelihood of having poor self-rated health in the group with primary education falls as social expenditure rises. The effects are statistically significant for both men and women, except for men, using the variable net total social expenditure as a percentage of GDP. In general, the effect is stronger for

women than for men. Women with secondary education enjoy the beneficial effect of social expenditure on self-rated health, whereas men in this educational group do not. All four coefficients are nonsignificant. These findings are robust for models with and without GDP and could also be identified in an alternative strategic test.

Fig. 9 presents the predicted probabilities of poor self-rated health for men and women for the interaction between net total social expenditure and education based on multilevel regression of individual data and national spending data. The figure shows that combining the main effects and interaction effects of these analyses makes the group with primary education have lower predicted probabilities of poor self-rated health when social expenditure increases. This, in turn, results in reduced educational inequalities in self-rated health, with higher spending on social protection for men and women alike. This also applies to the other three social expenditure measures.

For women, unlike men, all the slopes for secondary education differ significantly from the one for tertiary education. Because of the positive but nonsignificant main effects, the positive slopes, especially for women with the highest educational level, are highly uncertain. The positive but nonsignificant main effect also contributes to a slightly increasing slope for those with secondary education. Hence, firm conclusions regarding the changes in probabilities of poor self-rated health in the secondary and tertiary educational groups with higher social expenditure are hard to draw, although they are mostly negative for the secondary education group. What is clear, however, is that the outcomes are more favourable for the group with primary education, both in relative and absolute terms, in welfare states characterized by higher spending on social protection, regardless of the measure of social spending.

Fig. 10 and 11 further illustrate the fact that the primary education group benefits more from social spending by summarizing relative and absolute health inequalities by education for men and women for all four social expenditure measures (gross and net expenditures, expressed as a percentage of GDP or PPP). Increased spending more

drastically reduces educational inequalities for women than for men, both in absolute and relative terms.

Assessment of the comparative strength of the effect of each social expenditure variable on poor self-rated health in the primary education group is facilitated by the maximum and marginal effects calculated from the regression models. The maximum effect reflects the difference in the probability of poor self-rated health between the highest and the lowest observed value on the social expenditure variable in question. The marginal effect is the change in the predicted probability

of poor self-rated health associated with a one standard deviation increase from the mean. Net total social expenditure (PPP) has the strongest effects, with maximum effect of -0.07 (men) and -0.06 (women) and marginal effect of 0.019 (men) and 0.016 (women). Compared with some of the most influential individual-level effects, these effects are far from trivial. Compared with the reference category (male, mean age, non-immigrant, married, tertiary education, not employed), the effects of having primary education, immigrant status and being unmarried were 0.08 , 0.02 , and 0.03 , respectively (in predicted probabilities).

Fig. 10
Relative inequalities in self-rated health by level of social expenditure, men and women

GPSE: gross public social expenditure (% of GDP).
GPSEPPP: gross public social expenditure (in PPP).
NTSE: net total social expenditure (% of GDP).
NTSEPPP = net total social expenditure (in PPP).

Relative inequalities in health, primary versus tertiary, men

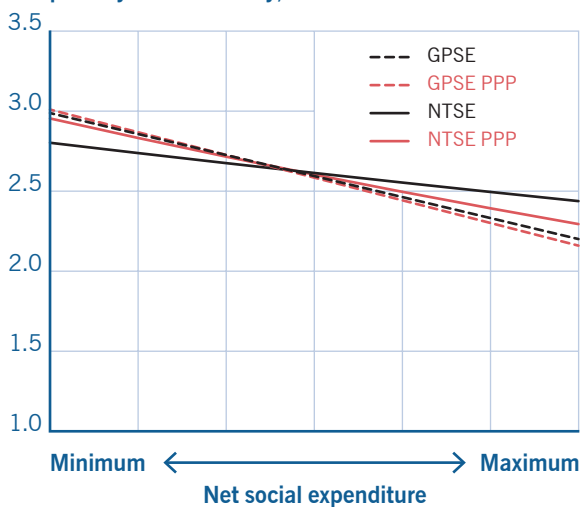
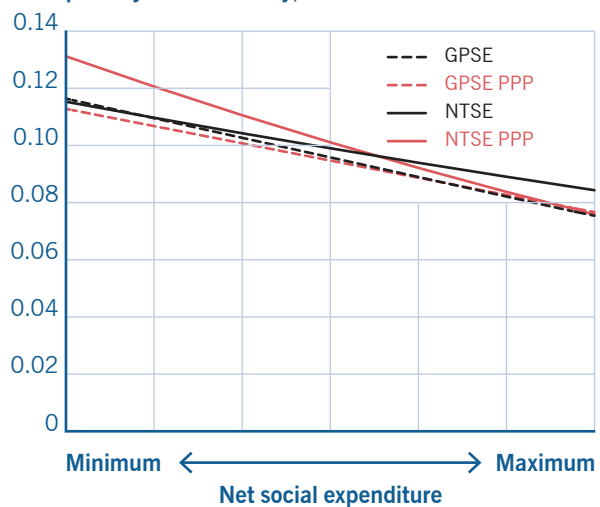


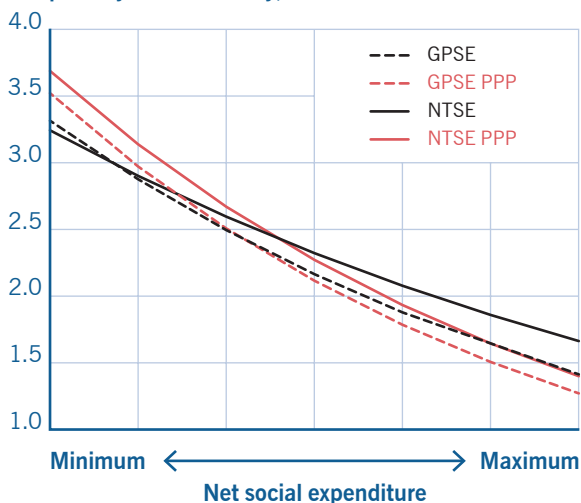
Fig. 11
Absolute inequalities in self-rated health by level of social expenditure, men and women

GPSE: gross public social expenditure (% of GDP).
GPSEPPP: gross public social expenditure (in PPP).
NTSE: net total social expenditure (% of GDP).
NTSEPPP = net total social expenditure (in PPP).

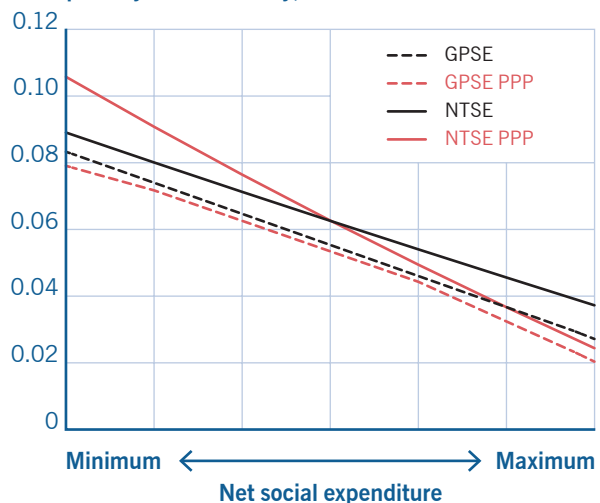
Absolute inequalities in health, primary versus tertiary, men



Relative inequalities in health, primary versus tertiary, women



Absolute inequalities in health, primary versus tertiary, women



Hence, for someone with primary education, the reduction in the probability of poor self-rated health associated with living in the most generous welfare state compared with the least generous one is almost equal to the total effect of education at the individual level. For the other expenditure variables, the maximum effects were smaller but still equal to the effect of being unmarried or having immigrant status.

In conclusion, the analysis of 18 countries in EU-SILC demonstrates that, net of

GDP, social expenditure is associated with health inequalities among both sexes but somewhat more consistently for women than for men. People with low education benefit more from high social transfers than those with secondary and tertiary education. In both absolute and relative terms, educational inequalities in health decrease as social spending rises. Different ways of operationalizing social spending, such as net versus gross and relative to GDP versus per capita, produce similar outcomes.

Social policy and health among young people⁸

From a life-course perspective, events and conditions earlier in life can strongly influence both living conditions and health later in life. Adolescence and early adulthood forms a formative period of great importance for several key social determinants of health. This is the period in life when education and training is largely acquired and when entrance into and establishment in the labour market should take place. There is a concern that the transition into gainful employment, and the social protection that follows from that, is becoming increasingly difficult for large groups of young people across Europe.

The health, and especially mental well-being, of young people is deteriorating relative to other population groups in the European Union countries. Although mortality among young people has declined over time, this decline has been significantly smaller than the decline among younger children (Viner et al., 2011). The current unemployment crisis in many European countries has also led commentators to call for urgent action to minimize the possible scarring effects of the current unemployment crisis on young people and thus to avoid creating a lost generation (Scarpetta et al., 2010). Scarring effects means that the experience of unemployment may increase future unemployment risks and/or may threaten future earning capacity, through a depreciation of human capital or through signalling effects (employers may interpret periods of unemployment as a signal of low productivity). Thus, in addition to the fact that unemployed people are especially likely to report poor health, evidence

suggests that young people's unemployment adversely affects both health and a range of other outcomes that are correlated with health – such as wages – many years later (Bell & Blanchflower, 2009). Economic support during times of unemployment has been singled out as a key policy priority in this context, since such support can help unemployed people in sustaining their search for employment (Scarpetta et al., 2010).

Moreover, high, and in many countries rising, unemployment rates among young people mean that many confront at least the prospect of unemployment at some stage in their lives. A large body of research provides evidence that job insecurity – the real or perceived fear of becoming unemployed – is linked to many adverse health outcomes, ranging from mental distress, anxiety and depression to increased mental and emotional exhaustion (Sjöberg, 2010). Some even suggest that the literature provides evidence of a causal link between job insecurity and well-being and that causal mechanisms should be sought in the individual's ability to control and plan his or her life (Burchell 1994, 1999). An important reason why uncertainty about future unemployment affects people's subjective well-being may be that it causes concern about financial security. Unemployment protection systems may alleviate the negative effects of job insecurity on the subjective well-being of employed people by reducing concerns about future financial security. However, although the importance of a sense of economic security for the mental well-being of both unemployed and

⁸ This section is based on an unpublished paper by Ola Sjöberg.

Table 3**Correlations between self-rated health and unemployment benefit generosity for older (30–54 years old) and younger (18–29 years old) respondents**

	All countries		Countries included in all four waves	
	Aged 18–29 years	Aged 30–54 years	Aged 18–29 years	Aged 30–54 years
2002	0.61**	0.68**	0.70**	0.69**
2004	0.53*	0.78**	0.63*	0.74**
2006	0.49*	0.74**	0.53*	0.77**
2008	0.32	0.69**	0.29	0.65**

* $P < 0.05$; ** $P < 0.01$.

employed people has long been recognized (Eisenberg & Lazarsfeld, 1938), the role of economic security as a moderator of the effect of labour market insecurity on the health of young people has been absent from the literature (Ferrie et al., 2005).

Four waves (2002, 2004, 2006 and 2008) of the European Social Survey have been used here to analyse possible links between unemployment benefit generosity and self-assessed health and mental well-being among young people (aged 18–29 years) and whether such links have changed over time. Data are available for 20 countries (15 of them included in all four waves).⁹

The European Social Survey data indicate a clear age gradient in self-rated health: young respondents report significantly better health than older respondents. This age gradient has also been fairly constant over the years: in 2002, the self-rated health

of young respondents was 4.15 and among older respondents (aged 30–54 years) it was 3.92. In 2008, the corresponding figures was 4.21 (young respondents) and 3.96 (older respondents).

In 2002, unemployment benefit generosity was strongly and highly significantly associated with self-rated health among both young and old respondents (Table 3). However, whereas this association has remained strong and significant for older respondents in all four waves of the European Social Survey, it has weakened notably over time for younger respondents, especially between 2006 and 2008. This conclusion is valid regardless of which countries are included in the analysis (all countries or only the 15 countries included in all four waves).

If the analysis is restricted to changes between 2006 and 2008, changes in unemployment benefit generosity appear to explain at least some of the change in self-rated health among young people between these two years (Fig. 12). Self-rated health tends to improve (or remain more or less constant) in countries in which unemployment benefit generosity increased and self-rated health tends to worsen in countries in which unemployment benefit generosity fell between these two years. However, there is clearly no one-to-one relationship between changes in these two variables between 2006 and 2008. To take one example, Sweden and Denmark both reduced the generosity of their unemployment benefits between 2006 and 2008 by roughly the same magnitude. But whereas average levels of self-rated health dropped among young people between these two years in Sweden (–0.13), they were more or less

⁹ The four surveys of the ESS all contain questions on self-rated health (“How is your health in general?”), where the possible answers range from 1 to 5, and 5 denotes better health). In addition, the ESS survey from 2006 contains questions on mental well-being according to the Center for Epidemiologic Studies Depression Scale (Radloff, 1977). The Center for Epidemiologic Studies Depression Scale was constructed to identify populations at risk of developing depressive disorders, and respondents were asked to indicate how often in the week before the survey they felt or behaved in a certain way (felt depressed, felt that everything was an effort, slept badly, felt lonely, felt sad, could not get going, enjoyed life or felt happy). These eight items were summed to an index that can vary from 8 to 32, where higher values indicate better mental well-being. Unemployment benefit generosity is measured by an additive index (ranging from 0 to 4, with higher values denoting a more generous system) consisting of four indicators: replacement level; qualifying period (the number of weeks individuals have to work to qualify for unemployment benefits); duration of benefits; and expenditure on unemployment benefits per unemployed person.

constant in Denmark. This illustrates the risks of overinterpreting findings in causal terms and that the macro and micro relationships involve many complex factors and processes.

The age gradient in self-rated mental well-being is less apparent than for self-rated general health. On average, younger respondents report better mental well-being than older respondents, but this difference is small, and in about half the countries, older respondents report better mental well-being than younger respondents. Among those 18–29 years old, mainly women and those with primary education report relatively low levels of mental well-being. Gender appears to interact with education as a factor, since the reported mental well-being score for women 18–29 years old with primary education is 25.8 versus 26.5 for men. However, this interaction is even stronger for older respondents: the self-reported mental well-being score for women 30–54 years old with primary education is 25.2 versus 26.2 for men.

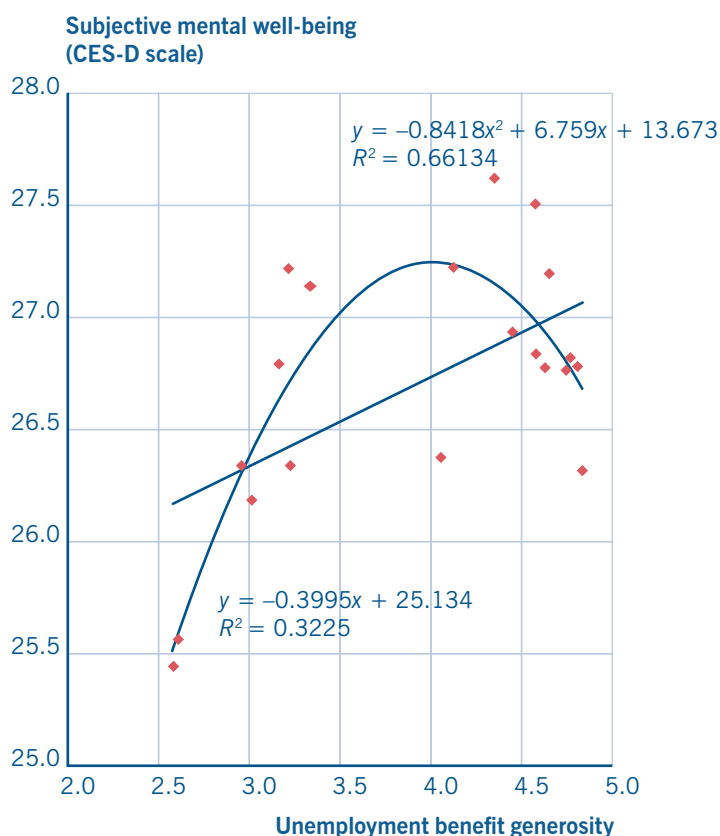
Self-reported mental well-being is also strongly related to unemployment benefit generosity (Fig. 13). However, adding a quadratic term improves the fit to the data further, which indicates that the relationship between unemployment benefit generosity and mental well-being among young people might be curvilinear. Although this relationship should be interpreted with some care – for example, the number of countries analysed is relatively small – it nevertheless supports the general conclusions of the present report: countries that provide relatively low levels of economic support during times of unemployment and that have lower average levels of mental well-being among young people can improve the health status of young people by improving the economic safety net. In contrast, in countries that provide a relatively extensive economic safety net for unemployment and that generally have lower levels of mental well-being among young people, such measures should preferably be complemented by other measures to further improve the health of young people.

Fig. 12
Change in the generosity of unemployment benefits and self-rated health, EU-SILC, 2006 to 2008



Change in unemployment benefit generosity

Fig. 13
Generosity of unemployment benefits and mental well-being (Center for Epidemiologic Studies Depression Scale) among respondents 18–29 years old, EU-SILC, 2006



Conclusions and recommendations

The problem with health inequalities is not the low mortality and the good health among more affluent and better educated people but the poorer health and lower life expectancy among those with less educational and economic resources. The problem with the different trends in mortality and life expectancy in various socioeconomic strata is not the improvement among the better off but the slower rate of improvement among those who already lag behind in terms of health and life expectancy (Shkolnikov et al., 2012; Strand et al., 2010; Tarkiainen et al., 2011).

The differences in health and mortality across strata defined by their educational or economic level are caused in part by the resources used to describe health inequalities, often the level of education and income of individuals and families. Although there are certainly several layers of intermediate factors linking, for example, income with health, increased income is likely to improve health and survival, albeit with diminishing returns. Although there are no easy solutions that will reduce health inequalities, improving the economic resources of those with lower incomes is clearly one way to reduce health inequalities by making more rapid improvement among those who are worse off.

The question is, accordingly: what types of policy are most effective in improving economic resources among the poorer segments of society? As illustrated in Fig. 1, disposable income is affected by several policy tools, including labour market policies, welfare and social protection policies and, as a result, taxation policies. Although this publication has focused on income maintenance and social protection, market incomes are essential for family incomes. The ability of families to earn market incomes is in turn affected by several factors, including skills that are directly affected by education.

Nevertheless, educational and labour market policies are not the only important policy responses. A large body of research has

demonstrated that low poverty rates are linked to universal, comprehensive and generous social protection programmes. Although combating poverty more effectively through targeted income redistribution might seem logical, universal programmes do a better job in terms of poverty alleviation. One reason for this is that poverty is a graded phenomenon, and that an inherent feature of targeted policies is that they require identifying poor or needy people. This, in turn, will mean that that programmes are means-tested with more limited population effects, marginal effects that cause poverty traps and higher control costs. Another reason is that including broader groups in society improves the standards and quality of programmes and services, which benefits the poorest people. It also means that popular support for and willingness to pay the taxes needed for more generous programmes is high across broad segments of the population, which adds to the sustainability of programmes. Taken together, this means that universal programmes are best suited to reducing poverty and increasing income security in broader segments of society.

As this report has demonstrated, the ability of social protection policies to maintain income and reduce poverty also extends to health and mortality. The unique analyses presented in this report indicates that lower poverty is associated with lower mortality, both among young children and adults. The amount of social spending, a crude indicator of the generosity of social protection programmes, appears to influence this.

In more direct analysis of the health effects of needs-adjusted social spending and social entitlements in a broad set of programmes, this analysis has confirmed that more generous social protection systems are linked to better health across a wide range of European countries. Although the analyses are rooted in different traditions and principles regarding how best to capture the content and ambitions of the welfare state, they

produce remarkably similar results. It is not only clear that the generosity or ambition of the welfare state, whether measured as needs-adjusted spending or the value of legal entitlements, is positively associated with health. More social security is actually better. In addition, the collective resources provided by the welfare state benefit people with low education more and therefore help to reduce health inequalities. This is consistent with the idea that the collective resources provided by the welfare state are more important to those who have fewer individual or family-generated resources.

The relationship between spending and entitlements and health is also curvilinear, with diminishing returns for health at high levels of social spending and social rights. This suggests that the easiest gains can be made in the countries with the least developed social protection systems. Even small improvements in legislated social rights and in social spending are likely to lead to improved health, according to the findings here. Although the results generally indicate that spending more on social protection will improve health and reduce inequalities, they also suggest that this recommendation is especially relevant for countries with the lowest levels of social spending in the WHO European Region. Hence, the research presented here clearly suggests that doing something in terms of social protection policies is better than doing nothing, and that even small increases in social spending are likely to result in health gains.

Nevertheless, if at least some social protection would improve health and health inequalities in the less affluent countries in the European Region, and the countries that already have some social protection would benefit from more, what about the countries that already spend extensively? The growing inequalities in mortality in several affluent countries in the western part of the European Region resulting from less favourable mortality trends in population groups with fewer resources suggest that the adequacy of existing social protection may still be worth considering. To some extent, at least in the Nordic countries, the redistributive and protective capacity of the welfare state has actually declined during

the past two decades or so (Kvist et al., 2012). For example, the social assistance and minimum income benefits have become less generous and less adequate in alleviating poverty in the Nordic countries since the early 1990s (Kuivalainen & Nelson, 2012). This indicates that the levels of social protection for the most vulnerable people need to be reinstated, and hence that there is room for more spending on social protection even in countries that already spend the most. This becomes especially important since the results suggest that more ambitious social security programmes tend to benefit everyone and not only those who need the benefits.

However, given the diminishing returns, simply investing in more social protection is probably not the only solution. Rather, this suggests that the existing social protection policies should be improved. The research presented here, does not indicate specific policies that need reforming; the whole range of social protection policies analysed in this report could be reviewed in each country. Such reviews could focus on the issue of whether policies are optimal in relation to their primary goals (return to work, poverty alleviation, educational credentials etc.) but should also consider the possible health effects of various policy solutions.

Although doing more and doing better are the main conclusions and recommendations, are there specific areas of social policy that should be in focus? In other words, what policy changes should be made in which policy areas to reduce health inequalities? These are difficult questions, not only because this report has studied broad measures of overall ambitions rather than specific policy areas but also because there is large variation between countries. However, some earlier studies suggest that more generous universal policies, such as basic pensions (Norström & Palme, 2010) can be important. In terms of social investment, policies targeting children, adolescents and their parents will be important. This research has focused primarily on economic resources, and the economic resources controlled by families and individuals depend on many factors and policy areas other than social protection policies. As illustrated in Fig. 1, policies

that affect employment and market incomes, including education and active labour market policies, are vitally important. But social protection policies are also highly important, both for the groups that need economic support at any given moment but also for all those who can potentially benefit from various types of social insurance. This is exemplified in Fig. 7, where the positive correlation between social rights and self-rated health is stronger among economically active people than among unemployed people. More generous social rights do seem to form an important social infrastructure that benefits whole societies.

Nevertheless, the findings enable general conclusions regarding priorities. One is that social protection policies are important across the whole life-course. The level of ambition or generosity of the welfare state as a whole rather than any single particular welfare policy is crucial. Although it is important not to oversimplify by solely relying on broad regime types, it is the welfare state in its entirety, and its collective resources, that influence the welfare resources and health chances of individuals. This is likely to be true cross-sectionally as well as over the individual life-course – the standards of pensions and old-age care are important for the relatives of older people, who would otherwise have to shoulder a heavier care load. Good pensions and care services available for older people reduce the informal care work family members have to carry out. Further, the prospects of good pensions and care services after retirement are also part of the social contract for people of working age. From a longer-term perspective, therefore, upgrading the whole range of social protection policies appears to be important.

In the short term, investing in children and young adults appear to be most urgent. The example of unemployment replacement rights and health among young people clearly indicates this. Although well-functioning unemployment benefit systems are crucial both as security for people who are employed and as a way to combat poverty among those who are currently unemployed, other policies are probably even more important for children and young adults. Family policies, childcare

provision, school policies and labour market policies are all likely to be important aspects of investment aimed at improving employment, economic resources and health among young people across Europe.

In this context, larger and more supportive welfare states may not only influence public health and inequalities in health but may also be more socially inclusive in terms of higher labour force activity among disadvantaged groups. New research evidence supports the idea that large and active welfare states are better endowed to employ groups that are often considered hard to employ. For example, van der Wel et al. (2011) found that higher social spending and more active labour market policy were associated with higher employment rates among people with a low level of education and who had limiting longstanding illness. This suggests that, in stronger welfare states, disadvantaged people are able to achieve better living conditions through economic activity. A likely macro effect is that such welfare states are more sustainable over time.

One critical counterargument to these conclusions and recommendations relates to the Nordic countries. If larger, more generous welfare states that have more extensive social rights and spend more on social protection have better public health and fewer health inequalities, why are there still substantial and growing health inequalities in the Nordic countries? This is an important question, and there does not seem to be any simple answer. The findings here are based on the variation in poverty, social rights and social spending across many European countries and are not simply determined by the Nordic countries. These results are also based on a variety of theoretical approaches, and the similarity in results indicates the robustness of the findings.

Nevertheless, the Nordic question remains. Numerous factors shape health problems and health inequalities, and although some of these are linked to economic resources and welfare policies, others are not. Thus, the Nordic countries have traditionally been successful in alleviating poverty and income inequality – outcomes directly related to the welfare state and social protection

policies – the further connection with health and health inequalities is much less direct. For example, the north–south divide in health inequalities in Europe is largely associated with cardiovascular disease, which in turn is determined by numerous individual, cultural and historical factors outside the social protection system. In certain cases, key aspects of the Nordic welfare state model, such as the high female labour force participation rate, may be associated with increased rather than decreased health inequalities through, among many things, higher smoking rates among women.

Nevertheless, the Nordic welfare model referred to in these debates is not a static construct. The regimes suggested by Esping-Andersen (1990) are based on the situation in the mid-1980s. Many fundamental changes have taken place since then in all the Nordic countries. They are still more successful than most other European countries at reducing poverty rates and income inequality, yet the latter has nevertheless risen in the Nordic countries also. The gaps between the welfare models of the Nordic countries and those in the rest of the WHO European Region have clearly diminished over time (Kvist et al., 2012).

In conclusion, this implies that dismissing ideas and findings about the importance of welfare state institutions is not particularly fruitful merely because health inequalities still exist in the Nordic countries. As this report has demonstrated, more generous and comprehensive welfare policies, including

social protection policies, are important tools for tackling some key social determinants of health and health inequalities in all countries. Inequalities in welfare resources and health are attributable to a variety of factors, and existing inequalities in health would have been much greater without the welfare states of the Nordic and other European countries. Nevertheless, the development of welfare policies, welfare resources and health inequalities in the Nordic countries remains a crucial issue for policy-making and research alike.

A further counterargument is that the welfare state undermines productivity, efficiency and economic growth. According to this view, the larger the welfare state and the more ambitious the social protection, the lower growth will be. The contention that there is a trade-off between efficiency and equality is often used in this argument. However, recent empirical and historical research contradicts this assertion: large welfare states do not appear to hamper economic growth and may, on the contrary, even increase economic wealth (Garfinkel et al., 2010; Lindert, 2004). Hence, social protection and welfare state policies should be viewed as important investment that provides the social infrastructure necessary for high employment rates (Morel et al., 2012). By investing in social protection, governments may therefore actually be able to improve health and well-being, reduce social and health inequalities, and thereby improve human capital and productivity.

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Annex 1

Work process

Thirteen topic and cross-cutting task groups worked to review the evidence on social determinants and the health divide in the WHO European region. Each task group was led by a chair who appointed leading experts in the field to his task group. Task groups worked between 2010 and 2012 independently, before reporting to the Review chair on their findings.

Five pieces of work were commissioned to cover the key issues identified by the Technical Group.

- 1 Dynamics of cross-national poverty and mortality rates
Johan Fritzell, Olli Kangas, Jennie Bacchus Hertzman, Jenni Blomgren, Heikki Hiilamo
- 2 Health inequalities across Europe: do welfare arrangements make a difference?
Espen Dahl, Kjetil van der Wel
- 3 Social rights and self-rated health in Europe
Tommy Ferrarini, Kenneth Nelson, Ola Sjöberg
- 4 Self-rated health among youths in Europe
Ola Sjöberg
- 5 Social protection policy transition and its effect on children's health and health inequalities in a liberal welfare state (New Zealand)
Frank Pega, Kristie Carter

The background papers have contributed to and informed some peer-reviewed academic publications, which are cited here in case of further interest.

Fritzell J, Kangas O, Hertzman JB, Blomgren J, Hiilamo H. Cross-temporal and cross-national poverty and mortality rates among developed countries. *J Environ Public Health*. 2013;2013:915490. doi:10.1155/2013/915490

Dahl E, van der Wel KA. Educational inequalities in health in European welfare states: a social expenditure approach. *Soc Sci Med*. 2013;81:60–69.

Ferrarini T, Nelson K, Sjöberg O. Unemployment insurance and deteriorating self-rated health in 23 European countries. *J Epidemiol Community Health*. 2014;68:657–662. doi:10.1136/jech-2013-203721

The work has been made possible because of the extraordinary efforts of the Technical Group members and the other colleagues who contributed these pieces of high-quality work in extremely short time to the Technical Group.

Annex 2

Methods

Poverty and mortality analysis

The two main data sources are the Luxembourg Income Study (LIS) and the Human Mortality Database. LIS is a cross-national harmonized database that includes multiple waves of micro data for a number of countries. It focuses on income inequality and poverty but also includes much information on such factors as family situation and employment status. The first wave started around 1980 with five-year intervals so that wave six of the data is around 2005 (for a thorough presentation of the database, see Atkinson et al. (1995)). LIS is commonly regarded as the best source for cross-national comparisons of poverty and income inequality. At the time of writing, the database included data from 36 countries. The Human Mortality Database (HMD), maintained by the University of California at Berkeley and the Max Planck Institute of Demographic Research, provides detailed open access mortality and population data for a number of countries for years reaching from the 1800s

to about 2009 or 2010 (www.mortality.org). Currently, the database includes information for 37 countries, which are partly the same and partly different than those in the LIS database. Our study includes all countries from LIS that have at least two waves of data from the same original survey source, and for these countries, all LIS waves for which also mortality data were available in the HMD for the corresponding years. Further, we decided to exclude Taiwan, China because of its peculiar nature compared with other mostly non-Asian countries that were included. These principles led to a country sample of 25 countries with 2–6 waves, a total of 116 data points. The countries included are Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Israel, Italy, Luxembourg, Netherlands, Norway, Poland, the Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, the United Kingdom and the United States.

Variables

The exposure of interest is then relative poverty rates, or at-risk-of-poverty rates as they are now called in EU language, for 25 countries from about 1980 to about 2005 (waves 1–6 of the Luxembourg Income Study). We use a standard income poverty head-count measurement in which the individuals living in households with equivalent disposable income lower than 60% of the median income are regarded as poor. Accordingly, we measure income after taking into account welfare state transfers and taxes. To be able to compare households of different sizes, we use a standard one-parameter equivalence scale that simultaneously tries to manage economies of scale and the fact that costs increase so that each household's disposable income is divided by the square root of the number of people in the household.

The poverty rates in each country and each wave were calculated separately for two age bands: children (0–4 years old) and working-age adults (25–64 years old).

Data on deaths and populations at risk were collected for 1-year age bands for each country from the HMD for all LIS wave years and for the three following years of each wave. The rates were calculated separately for each of the two age bands. Standardized rates were calculated to adjust for the different age structures of the countries. In these calculations, we used the direct method and the European standard population (http://www.euphix.org/object_document/o5338n27620.html). The standardized rates thus represent what the crude rates would have been if the populations of the countries had the same age distribution as the European

standard population. To allow for some exposure time on mortality after the cross-sectional poverty measurement, we calculated lagged mortality rates. Lagged standardized mortality rates were calculated as the average of the SMR of the LIS year and that of three following years.

All analysis used LIS wave number to allow for time-related changes in poverty and mortality rates. The wave number is also an indicator variable pertaining to the more or less automatic change process that takes place in all countries.

Data on GDP per capita were derived from Penn's world tables (http://pwt.econ.upenn.edu/php_site/pwt_index.php), which contain information on the GDP per capita levels for all the countries included in the analysis. The GDP levels are adjusted to the changes in the cost of living across time and space and are given in 2005 values. An additional income variable used was the household median disposable income provided by the LIS. These numbers were transformed into US dollars PPP by using the PPPs given in Penn's world tables. Our initial hypothesis was that the household disposable income is a better indicator of families' economic standards than GDP, which is more a macro-level variable. However, analysis showed that the correlation between these two variables is high ($r = 0.91$), and in some cases the household income variable was automatically dropped away when regressing together with

social spending. We finally decided to use GDP as an indicator of the general income level and wealth in the country.

We also tested the impact of income inequality (as expressed by the Gini index). After numerous experiments, we did not use the Gini index as a variable in models; the issue is discussed later.

The data on social expenditure are from OECD databases and expressed as a percentage of GDP. The measure includes both benefits in cash and in kind. In addition, administrative costs are included, but that is not a major problem since these costs comprise 2–4% of all expenditure. An additional welfare state measure is a dummy for the welfare state regime to which a country belongs. The classification follows the more or less standard classifications: Nordic welfare state model (Denmark, Finland, Norway and Sweden); continental European model (Austria, Belgium, France, Germany, Luxembourg, the Netherlands and Switzerland), the liberal cluster (Australia, Canada, Ireland, United Kingdom and United States); the southern European regime (Italy, Portugal and Spain), the post-socialist block (Czech Republic, Estonia, Hungary, Poland, Russian Federation, Slovakia and Slovenia) and the category of other (Israel and Taiwan, China). In principle, it was also possible to use country dummies, but in practice it was not a viable strategy given the high number of countries and the relatively small number of cross-sections.

Methods

In the first part of the analysis, we inspected bivariate plots to see the general pattern of the relationship between mortality rates and the background variables. Thereafter we proceeded to multivariate analysis to see how the bivariate relationships will change when other variables are included in the regression models. For regression analysis, we used pooled cross-sectional time-series methods. These methods take advantage of the panel structure of the data while taking care of the correlations of data points between waves using panel-corrected standard errors (Hicks, 1994; Hsiao, 1990; Micklewright, 1994). The analysis was conducted using the

Stata statistical package. Several regression techniques are available to deal with the special problems of analysing pooled data. Each has its weaknesses, and the results seem to be highly sensitive to the specific method applied (Beck & Katz, 1995; Hsiao, 1990; Huber & Stephens, 2000; Kittel, 1999). In this study, it is neither necessary nor possible to go deeper into these methodological problems. By using cross-sectional analysis and combining this with pooled regression data, we simply want to shed some light on the debate on the relationships between poverty, economic growth, the characteristics of the welfare state and mortality.

Models assuming and modelling autocorrelation tended to produce larger standard error but, satisfactorily enough, the levels of significance were robust. Pooled regression was run using the STATA 12 cross-sectional time-series package using Prais-Winsten regression. Here we tested two possible ways to model the autocorrelation. (1) The PSAR(1) model uses AR1 autocorrelation that is panel-specifically calculated. The good side is that it is tailored for each panel separately and the flip side is that it may be unstable if there are few cross-sections. (2) The AR(1) model uses as the name indicates use AR1 autocorrelation structure that is common for all panels. In order to further test robustness of our results, we ran both the AR(1) and PSAR(1) models separately. In practice, the results were robust for the different methods applied, and although the standard errors varied, the interpretations of the results did not.

The other option was to use fixed-effect regression models, but then we would have lost the effect of the level variables and our results would have been more dependent on

the short-term changes (Huber & Stephens 2000). To avoid this, we chose the approach described above. It seems reasonable to assume that it is the level of poverty rather than fluctuating yearly changes that affects mortality. We assume that the magnitude of poverty is lethal and not as much the annual fluctuation. The issue here is in which kind of circumstances people live or die and not as much how minor changes affect their health. One can think that a child poverty rate of 25% versus 10% percent rather than a change in poverty from 10% to 15%. However, to consider some of the fixed effects, we used dummies for the LIS wave and welfare state regime. The underpinning idea in the welfare regime thinking is that, in their social policies, some countries, due to learning from their closest neighbours and due to other historical legacies, have a high degree of family resemblance, and consequently, not only are the institutional set-ups of social policy but also the consequences, such as in terms of poverty, are similar in countries with the same welfare state regime (Esping-Andersen, 1990; Kangas & Palme, 2005; Kvist et al., 2012).

Social rights analysis

The EU statistics on income and living conditions (EU-SILC) was introduced to improve the reliability and coverage of social indicators in the EU, and the analysis in our study is based on data from 2006. Health is indicated by the respondents' own rating, previously demonstrated to be a reliable indicator of health status and frequently used in epidemiology. Analysis is mainly based on the question "How is your health in general? Would you say it is...", where respondents could choose between five categories ranging from "very bad" to "very good". Analysis using this variable (recoded so that 5 = "very good health" and 1 = "very bad health") can also be compared with the results using a dichotomized version (where "fair", "good" and "very good" = 1 and 0 otherwise) of this variable. Two other variables measuring other aspects of self-rated health are also used: (i) the respondent's self-assessment of whether he or she is hampered in the daily

activity by any ongoing physical or mental health problem, illness or disability (where "strongly limited" and "limited" = 1 and "not limited" = 0); and (ii) whether the respondent has any chronic (longstanding) illness or condition. Analysis is restricted to the core working age population 25–54 years old since our institutional measures refer to benefits for the population of working age, except when we replicate the results from Dahl & van der Wel (paper 2 commissioned for this report) when the population 18–85 years old is analysed.

Several individual-level characteristics are also introduced as control variables in the multi-level analyses and for stratifying the sample in analysis comparing subgroups. Following Dahl & van der Wel (2011), a three-level version of International Standard Classification of Education (ISCED) 97 was used in the analysis, where the educational groups 0–2 (low, lower-secondary completed),

3–4 (medium, upper-secondary completed) and 5–6 (high, tertiary education completed) are grouped into the respective categories: primary, secondary and tertiary education. Economic status is based on reported activity status in the income reference period (normally 12 months): if the number of months in full- or part-time work exceeds 6, the respondent is considered to be economically active; if the number of months in unemployment exceeds 6, the respondent is considered to be unemployed; if the number of months in retirement exceeds 6, the respondent is considered to be retired; and if the number of months in education or inactivity exceeds 6, the respondent is considered to be inactive. Household type is divided into single households, couples living together with no children, couples living together with one or more children and lone parents with one or more children. Country of birth is divided into native-born, born in another EU country and born outside the EU. Finally, the presence of economic problems is based on respondent's own assessment of the level of difficulty experienced by the household in making ends meet (where "with great difficulty" = 1 and 0 otherwise).

The data on social rights refer to the situation in 2005 and are from several different sources. The Social Citizenship Indicator Program (SCIP) provides type-case benefit level data on state-legislated family policy, sickness and unemployment benefits. For each programme, the size of benefits after taxation is calculated at the level of an average wage for a single earner type-case and a two-parent family with children. To standardize indicators across countries, the benefit levels are expressed as net replacement rates: the ratio between the net benefit and the after-tax wage for each type case. For unemployment and sickness insurance, the average of two periods of duration in receipt of benefits is used: 1 week and 26 weeks, while for the other benefits the yearly benefit rate is used. The data on disability benefits are from Palme et al. (2009) and coded with similar principles as in the SCIP, assuming 100% work incapacity. Indicators on minimum income protection are from the Social Assistance

and Minimum Income Protection Database (SaMip) (Nelson, 2007). Since minimum income benefits are not intended to provide income security for losses in work income but are used to mitigate low income and poverty, benefits are in this case standardized across countries by using Eurostat PPP. Information on countries and programmes not covered by the above-mentioned databases have been collected and harmonized to allow cross-country comparisons using MISSOC (2010), the OECD Tax Database and national sources.

To construct a single measure on the level of social rights, each benefit-level indicator above has been standardized according to the highest value. The level of social rights is the mean value of the standardized benefit levels for unemployment insurance, sickness and disability benefits, family benefits and minimum income benefits. For some countries, in particular those in central and eastern Europe and parts of southern Europe, incomplete coverage and uptake of benefits may distort the analysis and bias the results (Palme et al., 2009). It has not been possible to collect reliable comparable information on benefit coverage and uptake covering all EU countries. We therefore had to rely on other strategies, which involve weighting the social rights index above by per capita adjusted social benefit expenditure.¹⁰ The rationale for doing this is that high benefit levels together with high levels of benefit coverage and uptake should result in high levels of per capita expenditure. High benefit levels combined with very low levels of per capita expenditure are likely to be the result of insufficient benefit coverage or uptake.

The multi-level analysis also uses a measure of the provision of public services (measured as provision of public services per head). Public services are here defined as benefits granted in the form of goods and services.

¹⁰ The social expenditure data are from Eurostat. Per capita social expenditure is an additive index that includes unemployment benefit expenditure per unemployed person, benefit expenditure per inactive citizen due to sickness or disability and family benefit expenditure per child younger than 14 years. Although the correlation between the weighted and unweighted social rights indices is very high ($r = 0.86$), the weighted figures particularly reduce benefit levels in most of the countries in central and eastern Europe.

The classification of in-kind versus cash benefits is based on the European system of integrated social protection statistics (ESSPROS) method. The most important in kind benefits are the following: in sickness and health care, in-kind benefits consist mainly of inpatient health care (both direct provision and reimbursement), outpatient health care and direct provision and reimbursement of pharmaceutical products. Benefits in kind related to disabilities are

accommodation, assistance in carrying out daily tasks and rehabilitation. In family policy, benefits in kind consist of childcare, accommodation and home help. Related to unemployment, benefits in kind consist of mobility and resettlement, vocational training and placement services and job-search assistance. Finally, in areas related to social exclusion benefits, in kind consists mainly of accommodation and rehabilitation of alcohol and drug abusers.

Social expenditure analysis

Analytical strategy and presentation

The data are analysed by multilevel models (Kreft & De Leeuw, 1998), with individuals nested within countries. Multilevel modelling allows us to estimate the effects of individual and contextual characteristics as well as cross-level interactions simultaneously on the dependent variable, in this case individuals' self-rated health. The main issue of the paper – whether and how welfare characteristics modify the association between social position and health – is essentially a question of statistical interaction between a level I variable (education) and a level II variable (spending): cross-level interaction. Hence, the method chosen in this paper is to test interaction terms between education and our four measures of welfare expenses in separate models. It seems that this approach – which we see both as the most appropriate and powerful one, is rarely seen in comparative studies of welfare and health inequalities. Since our attention is directed towards relative and absolute inequalities, the results are presented as graphs illustrating both kinds of inequalities as well as levels in terms of probabilities.

We use the EU-SILC 2005 cross-sectional national surveys, which include 26 EU countries as well as Norway and Iceland (Eurostat, 2008). Because of missing information on social spending, seven countries had to be excluded from the present analysis: Cyprus, Estonia, Hungary, Greece, Latvia, Lithuania and Slovenia. Thus, this analysis encompasses 19 countries and includes 133 226 women and 117 969 men within the age span 25–80+ years of age.

All models were estimated by random intercept multilevel logistic regression: xtlogit in STATA version 9.

Dependent variable

The health outcome is self-perceived health. It was measured by a question on self-rated (global) health. On a 1-to-5 scale, 4 (poor health) and 5 (very poor health) are coded 1 (poor self-rated health) and 0 otherwise.

Individual-level independent variables

A three-level version of ISCED 97 was used in the analysis, where the educational groups 0–2 (low, lower-secondary completed), 3–4 (medium, upper-secondary completed) and 5–6 (high, tertiary education completed) were grouped into the respective categories: primary, secondary and tertiary education (Schneider, 2009).

In addition, the following variables were entered in all models: age (25–80+ years), marital status: married, unmarried, previously married; country of birth: EU, other; employment status: employed, non-employed. The analysis was stratified by sex.

Contextual “welfare” variables

The four measures of spending are intended to measure different aspects of generosity: the economic resources provided for each individual – standardizing for differences in need – by the state, and (for some measures) also by private actors (Gilbert, 2009). Our empirical approach meets several of the objections raised against the spending approach. As recommended by Gilbert (2009), we are controlling for “need”,

although imperfectly, and GDP. As Gilbert (2009) argues, (potential) recipients' welfare depends on what they actually are paid: net benefits and not gross benefits. Thus, we compare social spending per GDP per population in need with welfare generosity as measured by PPP per capita divided by the population in need.

Net transfer payments take account of taxes, tax expenditure and private welfare expenditure (Gilbert, 2009). In particular, in a resource perspective, net transfer payments may be more exact and to the point than gross transfers.

The following four measures of resource allocation were obtained from the OECD Social Expenditure Database (SOCX).

Gross public social expenditure as a percentage of GDP (GPSE)

(Source: DELSA/ELSA/WDSEM, 2009), Table A.3.1.a, page 84, data for 2005).

Includes: old-age, survivors, incapacity, health, family, active labour market policies and unemployment, housing and other social policy areas.

Net total social spending as a percentage of GDP (NTSE)

Estimated by OECD in the source above by first estimating gross total social expenditure, which is GPSE added to gross voluntary private expenditure. To obtain the NTSE measure, direct and indirect taxation had been subtracted from GTSE.

Gross public social expenditure per capita in US dollar purchasing power parities (GPSEpc)

Following Gilbert (2009, Appendix 1), we estimated these numbers by taking the relevant percentage off of OECD's GDP per capita in US dollar purchasing power parities (GDPpc) given by GPSE above: $GPSEpc = GDPpc * GPSE/100$.

Net total social spending per capita in US dollar purchasing power parities (NTSEpc)

Following Gilbert (2009, Appendix 1), we estimated these numbers by taking the relevant percentage off of OECD's GDP

per capita in US dollar purchasing power parities (GDPpc) given by NTSE above: $NTSEpc = GDPpc * NTSE/100$.

All four measures of social spending were divided on "need", or the countries' dependency ratio. This dependency ratio was estimated by estimating the rate between all employed individuals (total employment in thousands from OECD Annual Labour Force Statistics) and the total population (population dataset). It expresses the proportion of the population not provided for by the labour market and that hence needs state transfer payments (and other kinds of provision). The motivation for dividing all expenditure data by the dependency ratio is that our measures of social expenditure are principally indifferent to need (Castles, 2004; Gilbert, 2009, p. 361). This often-overlooked property of social expenditure data has led to an implicit assumption that the more, the better. Countries that spend a higher proportion of their GDP or more dollars per capita on social welfare measures are leaders and those that do not are laggards (Gilbert, 2009, p. 361). Thus, the expenditure measure may simply reflect large shares of older people in the population or widespread unemployment rather than the actual resources available to individuals in need. Making the social expenditure data relative to the share of the population not provided for by the labour market obtains a more precise measure of resource allocation within each country.

As net spending divided by GDP and net per capita (PPP) are measures that are likely to more accurately capture the money or the resources each person in need actually has at his or her disposal, and hence express the amount of goods he or she can buy, we might expect that these two versions of social spending will more strongly affect the distribution of health than the two other measures.

At the national level, GDP per capita (GDPpc) was entered as a control variable to remove the effect of national differences in wealth. This was collected from Eurostat and centred on its mean. Also, GDPpc was divided by 1000 to obtain regression coefficients with readable decimals.

Analytical model

For each sex, we estimated four equations, each including a separate and distinct measure of social expenditure (denoted soc. exp in the equation below).

$$\text{Logit}(\text{poor health}) = B_0 + B_1 * \text{edu} + B_2 * \text{controls} + B_3 * \text{GDPpc} + B_4 * \text{soc. exp} + B_5 * (\text{soc. exp} * \text{edu})$$

Where the “controls” were age, country of birth, marital status and employment status. The coefficient B5 for the interaction term captures how social expenditure modifies the relationship between educational level and poor health. Thus, we graphed these interrelationships by using the formula:

Predicted probabilities:

$$(P = 1 / (1 + \text{EXP}(-\text{predicted logged odds}))$$

The values of the four individual control variables were kept constant. The graphs show the interaction between education, social spending and poor health for a person of average age, who is born inside the EU, married and economically active. The advantage of calculating probabilities is that it enables us to examine absolute levels and absolute inequalities as well as relative inequalities.

The WHO Regional Office for Europe

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

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Social protection, income and health inequities

Final report of the Task Group on GDP, Taxes, Income and Welfare

Review of social determinants of health and
the health divide in the WHO European Region

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