

The role of welfare state principles and generosity in social policy programmes for public health: an international comparative study

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Summary

Background Many important social determinants of health are also the focus for social policies. Welfare states contribute to the resources available for their citizens through cash transfer programmes and subsidised services. Although all rich nations have welfare programmes, there are clear cross-national differences with respect to their design and generosity. These differences are evident in national variations in poverty rates, especially among children and elderly people. We investigated to what extent variations in family and pension policies are linked to infant mortality and old-age excess mortality.

Methods Infant mortality rates and old-age excess mortality rates were analysed in relation to social policy characteristics and generosity. We did pooled cross-sectional time-series analyses of 18 OECD (Organisation for Economic Co-operation and Development) countries during the period 1970–2000 for family policies and 1950–2000 for pension policies.

Findings Increased generosity in family policies that support dual-earner families is linked with lower infant mortality rates, whereas the generosity in family policies that support more traditional families with gainfully employed men and homemaking women is not. An increase by one percentage point in dual-earner support lowers infant mortality by 0·04 deaths per 1000 births. Generosity in basic security type of pensions is linked to lower old-age excess mortality, whereas the generosity of earnings-related income security pensions is not. An increase by one percentage point in basic security pensions is associated with a decrease in the old age excess mortality by 0·02 for men as well as for women.

Interpretation The ways in which social policies are designed, as well as their generosity, are important for health because of the increase in resources that social policies entail. Hence, social policies are of major importance for how we can tackle the social determinants of health.

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Introduction

When addressing the wide range of social determinants of health, an equally wide range of policies needs to be considered.¹ In a general sense, social determinants of health consist of resources through which the individual can control and direct their conditions of life.² Consequently, lack of such resources will increase the risks for poor health and premature mortality. Resources are generated within the family and in the market, but also through the welfare state. Although there is a range of resources that are important to health, economic resources are central since they can easily be transformed into other types of resources. Also, economic resources can be directly reallocated by the welfare state through social policies, including programmes such as unemployment insurance, sickness insurance, family support, and pensions, and also by means of subsidised or free services such as child care, health care, or elderly care.

There are large variations across welfare states in the guiding principles behind policy schemes as well as the

ambition of these schemes. As a consequence, there are large variations in the proportion of the relevant population covered by specific programmes and in how generous these programmes are. In addition to the benefits provided, welfare state institutions and policies can improve people's ability to generate resources in the market, for example through active labour market policies or by implementing policies that enhance women's labour force participation. Thereby, different welfare state set-ups will have consequences in terms of the resources available to individuals, and especially the amount of resources available to those in low-income or middle-income groups.

The Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden) have developed a distinct type of welfare state. Some typical characteristics include universal social policy programmes, equality in opportunities and outcomes as explicit goals for social policies, a large public sector with extensive transfer programmes and services, high employment rates, and high taxes to finance these programmes. Some other

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Panel 1: Family policy models based on the dominating type of family support

Dual-earner model

Denmark; Finland; Norway; Sweden

General family policy model

Austria; Belgium; France; Germany; Ireland; Italy; Netherlands

Market-oriented family policy model

Australia; Canada; Japan; New Zealand; Switzerland; UK; USA

countries have opted for more market-based policy solutions, where the responsibility of the welfare state is mainly restricted to poverty relief, whereas others have arranged welfare programmes along occupational categories and with a strong focus on social protection schemes supporting the traditional family model where the man is the main income-earner.³

Differences in principles and generosity can be noted in national variations in poverty rates, where countries with universal social policies (such as the Nordic countries) have much lower poverty rates than countries with an emphasis on residual and targeted social policies (such as the UK and the USA).⁴ In particular, the Nordic countries have low poverty rates among vulnerable groups like children, single parents, and elderly people.^{5,6}

Since social policies could therefore have an important effect on key social determinants of health, we need to ask whether welfare state characteristics are conducive to better population health. Here we ask to what extent social policy solutions typical for the Nordic countries, but applied to different extents in different countries at different points in time, are important for mortality. Although comparisons between countries or groups of countries can partially answer this question, analyses of variations in the generosity of specific programmes provide a more precise test. We therefore do not simply compare Nordic countries with two or three groups of other welfare state types, but focus directly on the output of these social policy programmes and their consequences for public health.

We focus on two types of welfare state programmes—namely, family support and pensions. Family and pension policies will affect economic resources and poverty rates among children and their parents and elderly people, respectively, and can therefore be important for health and wellbeing early and late in life. Our aim was to study the levels of generosity in these programmes, and to what extent variations in generosity are linked to variations in mortality across 18 countries of the Organisation for Economic Co-operation and Development (OECD) during the post-World War 2 era. On the basis of these and other findings from a larger project focusing on the Nordic experience of welfare states and public health (the NEWS project⁷), undertaken as a contribution to the Commission on Social

Determinants of Health,⁸ we also discuss the possibility of generalising the findings of our study to other countries.

Methods

Data sources

Information on indicators of policy characteristics were derived from the Social Citizenship Indicator Program.⁹ These data include information on legislated social rights in 18 countries from 1930 to 2000. Only benefits that are legislated in the statutory systems, typically in social insurance and assimilated programmes, were included. These benefits (net of taxes) were calculated for different types of model households and expressed as a ratio to an average production worker's wage (net of taxes). Hence, the replacement rate is the value of the benefits as a percentage of an average production worker's wage. The countries covered were Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Sweden, Switzerland, UK, and USA.

Two types of information were used in our analyses: the design or characteristics of family policies and pensions; and the generosity as measured by the replacement rate in these programmes. Social policies were grouped according to their characteristics. The generosity level of different types of support at different time-points for each country were calculated on the basis of legislated rights as applied to type-case families, and expressed as percentages of an average production worker's wage (net of taxes).

Family policies are fairly new to welfare state programmes. Compared with many other social policy programmes, family policies continued to expand in the last decades of the 20th century, and welfare states in high-income countries have developed quite different models of family policy.^{5,10,11} The dual-earner support policy is designed to allow mothers and fathers alike to combine paid employment with childcare. It includes earnings-related parental leave benefits, universal child benefits, and childcare support. The general family support policy largely relies on a highly gendered division of labour, with programmes such as flat-rate benefits for leave needed for childcare and subsidies to wage earners with a dependent spouse. The dual-earner support policy dominates in the Nordic countries (panel 1), where workforce participation rates for women of childbearing age are higher than in other countries.⁵ The continental European countries included in this study (except Switzerland) have mainly introduced the general family support policy. The other countries have maintained family policies of both types at low levels (panel 1), thereby leaving family support and childcare to be dealt with by families mainly through the market.

All countries included in the study have identified two problems that public pensions should address:

basic security, which is aimed at providing basic economic security for all, thus eradicating poverty in elderly people; and income security, which is aimed at maintaining economic standards after retirement. Although most developed countries have a combination of these types of public pension rights, there are clear differences in terms of the mix and in terms of generosity.

On the basis of the dominating principle adopted for public pensions, countries can be grouped into three categories (panel 2).¹² One set of countries has adopted a public pension model that combines universal basic pensions and earnings-related income security pensions, known as the encompassing model. Another group of countries mainly delivers earnings-related income security benefits, typically with separate programmes for different occupational categories or corporations (the state corporatist model). The third group consists of countries where public pensions only include basic benefits, thus allowing private pensions to have a large role (the basic or targeted model).

Mortality data were obtained from the Human Mortality Database and from the WHO Mortality Database. Infant mortality rate is defined as the number of deaths during the first year per 1000 livebirths and refers to the years for which we have social policy data. The analysis of old age excess mortality was based on annual all-cause mortality. Age-standardised mortality rates (deaths per 100 000 people) were constructed for the age-groups 30–59 years and 65 years and over, and averaged over 5-year periods to match social policy data, where mortality information for a specific year contained information for that and the following 4 years. In this way, short-term lag-effects were incorporated into the mortality measures.

We studied old-age excess mortality, calculated as the ratio between the mortality rates in people aged 65 years or older and those aged 30–59 years. The main reason for this approach was methodological. If a potential time-varying confounder is linked to our explanatory variable (and the outcome), the fixed effects model will still yield biased estimates, and the only remedy is to include the confounder or at least a proxy. For example, increases in the generosity of the pension benefits could possibly be co-occurring with increases in health care. If increased health care results in reductions in mortality in general, including old-age mortality, the estimate of the pension effect would be contaminated. We therefore chose to control for this possibility indirectly by focusing on excess mortality, rather than old-age mortality. The mean excess mortality is 11·3 for men and 12·8 for women.

Data for gross domestic product (GDP) were obtained from Angus Maddison's databank;¹³ data for female workforce participation from the International Labour Organization; and data for unemployment from the OECD.¹⁴

Panel 2: Policy models based on the mix of basic security and income security pensions

Encompassing model

Finland; Norway; Sweden

State corporatist model

Austria; Belgium; France; Germany; Italy; Japan

Basic/targeted model

Australia; Canada; Denmark; Ireland; New Zealand; Netherlands; Switzerland; UK; USA

Statistical analyses

One concern in macro-level cross-national analyses is the small number of observations. An effective way of increasing this number is the pooled cross-sectional time-series analysis. We pooled data from several cross-sections and analysed variation over time for the 18 countries included in the study. The family policy analysis used data from 1970 to 2000 with data points at every fifth year, but owing to differencing (change from one point in time to another by subtracting), we have information from 1975, and hence 108 observations (18×6). The pension policy analysis used data from 1950 to 2000, also for every fifth year, but due to differencing and mortality data ending 2000, the number of observations was 162 (18×9).

The analytical technique that we used (fixed-effects models through the inclusion of country dummy variables) explores only the intrastate co-variation

For the Human Mortality Database see <http://www.mortality.org>

	1960–64	Average years	2000–03/04	Average years
Category 1				
Sweden	73·4	72·4	80·0	78·9
Norway	73·5	72·4	78·9	78·9
Denmark	72·4	72·4	77·3	78·9
Finland	69·1	72·4	78·1	78·9
Iceland	73·6	72·4	80·3	78·9
Category 2				
Netherlands	73·5	70·8	78·7	78·7
Belgium	70·3	70·8	78·2	78·7
West Germany	70·0	70·8	78·7	78·7
Austria	69·6	70·8	78·7	78·7
France	70·7	70·8	79·4	78·7
Category 3				
Italy	69·6	69·7	79·8	79·7
Spain	69·8	69·7	79·6	79·7
Category 4				
England/Wales	71·3	70·7	78·6	77·9
USA	70·2	70·7	77·2	77·9
Category 5				
Japan	69·0	69·0	81·7	81·7
Unweighted averages for categories of countries. Source: Human Mortality Database (HMD 2006).				
Table 1: Overall life expectancy (years) in 15 high-income countries				

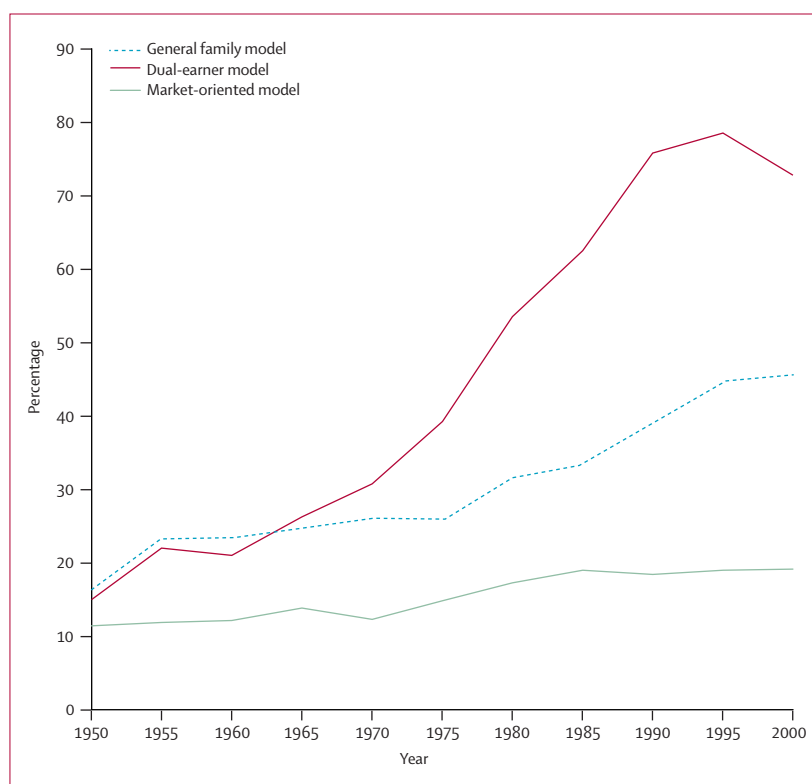


Figure 1: Average family policy generosity in countries with differing models of family policy 1950–2000
Benefit generosity of transfers as a percentage of an average production worker's net wage.

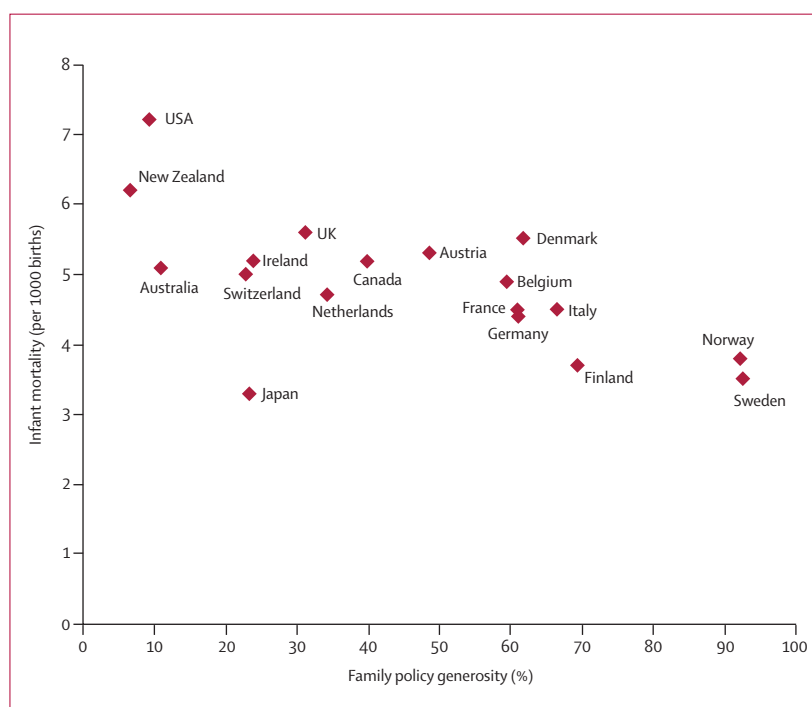


Figure 2: Total family policy generosity and infant mortality in 18 countries around 2000
Net benefit generosity of transfers as a percentage of an average net production worker's wage. Infant mortality expressed as deaths per 1000 individuals. Sources: SCIP, Mortality database, WHO.

between, for example, GDP and mortality, over time and therefore avoids the potential bias from the interstate correlation. Furthermore, to remove non-stationary trends, differences were calculated within series from one observation to the next, thereby measuring change.¹⁵ In line with standard procedure,¹⁶ we used panel-corrected standard errors and correction for auto-regression.

Historically, economic growth has been a key macro-level factor behind reduced mortality rates, and variations in GDP are also likely to be important for variations in the generosity of social policy programmes. We therefore control for GDP as a potentially important confounder, and in the case of family policies also for female labour-force participation and unemployment rates.

Role of the funding source

The NEWS project was begun on request of the WHO Commission on Social Determinants of Health. The financial support given to the project was part of Sweden's, Norway's, and Finland's support for the commission. The sponsors had no role in the design, data collection, data analysis, data interpretation or writing of the report. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit for publication.

Results

At the start of the 20th century, life expectancy was higher in the Nordic countries than in any other country in Europe. Within these countries, Finland had the lowest life expectancy during the early 1960s (table 1). However, towards the end of the century, Finland's position became increasingly similar to the other Nordic countries, a period also characterised by expansion of the welfare state and public welfare institutions. Denmark, on the other hand, showed a less favourable trend with slower improvements in life expectancy after 1960.

Generally, life expectancy levels have tended to converge, but there were clear differences in the pace of improvement. Japan has moved from an ordinary level to the top position in the world, and Italy and Spain have had a very positive development. The UK and USA, however, have had smaller improvements in mortality than many other countries. An important source for increasing life expectancy is reduced infant mortality, and the Nordic countries had their reduction in infant mortality earlier than countries such as Italy and Spain. With infant mortality rates down to three per 1000, the Nordic countries remain among the top ranking countries in the world.

Further improvements in life expectancy are mainly driven by reductions in mortality at older ages. The Japanese advantage over Iceland and Sweden in overall life expectancy is mainly a result of higher female life expectancy at age 65.⁷ However, variability in mortality—the distribution of age of death around the mean (life expectancy)—was higher in Japan than in the Nordic

	Model 1	Model 2	Model 3	Model 4	Model 5*	Model 6*	Model 7*
GDP per head of population	0.345 (0.272) p=0.149	..	..	..	-0.0079 (0.306) p=0.979	-0.0152 (0.298) p=0.959	0.0644 (0.300) p=0.830
Total family policy generosity†	..	-2.840 (1.705) p=0.096	..	..	-2.573 (1.441) p=0.074	..	..
Dual-earner support†	..	..	-4.256 (1.881) p=0.024	..	..	-3.772 (1.865) p=0.043	..
General family support†	..	..	..	-0.129 (2.755) p=0.963	..	..	-0.106 (2.366) p=0.964
R ²	0.21	0.23	0.24	0.21	0.31	0.32	0.30

Regression coefficients. First four columns are bi-variate analyses, including one of the four independent variables listed one at a time. Last three columns are multi-variate regressions including those variables for which estimates are presented. Estimates based on pooled cross-sectional time-series analysis of differenced data for 18 OECD countries 1970–2000. Number of observations=108. Country dummies included, standard errors in parentheses. *Models include control for unemployment rates and female labour force participation in ages 20–44. †Estimates multiplied by 100.

Table 2: Estimated effects of family policy generosity on infant mortality

countries, with the exception of Finland.⁷ This finding indicates that, although other countries have been capable of contributing to healthy environments at more or less the same rate as the Nordic countries, such environments tend to be more evenly distributed in Nordic countries.

Figure 1 shows the average generosity of family policy transfers from 1950 to 2000 in countries grouped by their family policy models. The Nordic countries in the dual-earner model have had a rapid increase in family policy generosity from the middle-to-late 1960s, mainly due to the earnings-related benefits for parental leave. A direct effect of this policy is that poverty levels in families with children are low in Nordic countries.⁵ This effect is probably due to a combination of the amount of benefits paid and the support for two wage-earners, which increases the market income of the household. Family policy generosity also showed a negative association with infant mortality rates, meaning that higher generosity is associated with lower infant mortality rates (figure 2).

Table 2 shows the results of pooled time-series regressions of infant mortality between 1970 and 2000, where variations in mortality rates are regressed on variations in generosity. We estimated effects for dual-earner support, general family support, and a combined measure of total support. The first four columns show the crude estimates. The results indicate negative effects of family policy, whereas no association with GDP is noted after 1970–75. Therefore, the generosity of transfers is associated with reduced infant mortality rates, whereas economic development is not. In the multivariate models (columns 5–7) controls are made for GDP per head of population, and for unemployment rates and labour-force participation of women of childbearing age (data not shown). Generosity in programmes that support dual-earner families was significantly related to infant mortality rates also after these adjustments. The estimate suggests that an increase by one percentage point in dual-earner support lowers infant mortality, by 0.03772 deaths per 1000 births, and is based on the average infant mortality rate (8.55 per 1000 births) for all countries

for the whole study period. Generosity of general family policies, however, was unrelated to infant mortality rates. Alternative model specifications, using levels of the dependent and independent variable or a lagged dependent variable, showed a consistent negative association between family policy and infant mortality, whereas GDP was unimportant.

Figure 3 shows the generosity of the basic security pensions in the 18 countries grouped by their public pension mix. Since 1950, there has been a general increase in all three types of pension support. However, the increase has been more pronounced in the Nordic (encompassing) group, whereas the levels of pension support have remained fairly modest in the state corporatist group of countries.

The replacement rate for income security pensions has also increased in all types of welfare states (figure 4). Although the state corporatist countries had more generous income security pensions during the first half of the study period, replacement rates have been higher

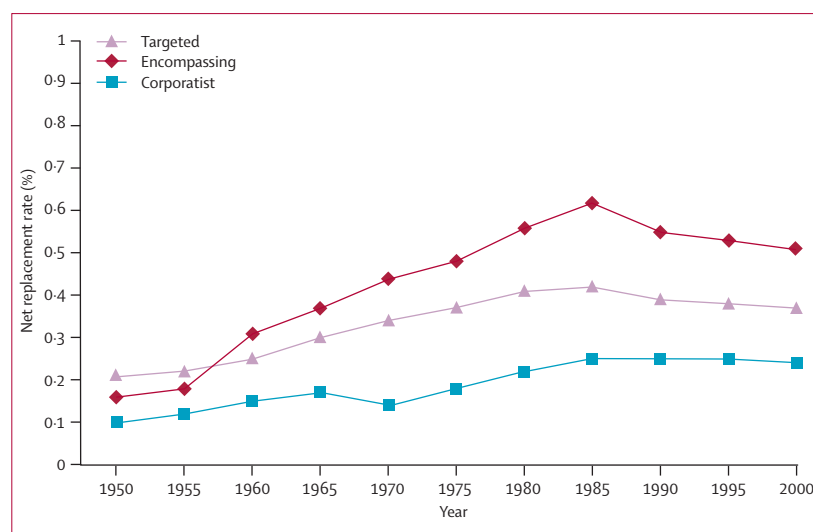


Figure 3: Net replacement rates for basic security pensions, expressed as a percentage of average worker's wage, by pension type

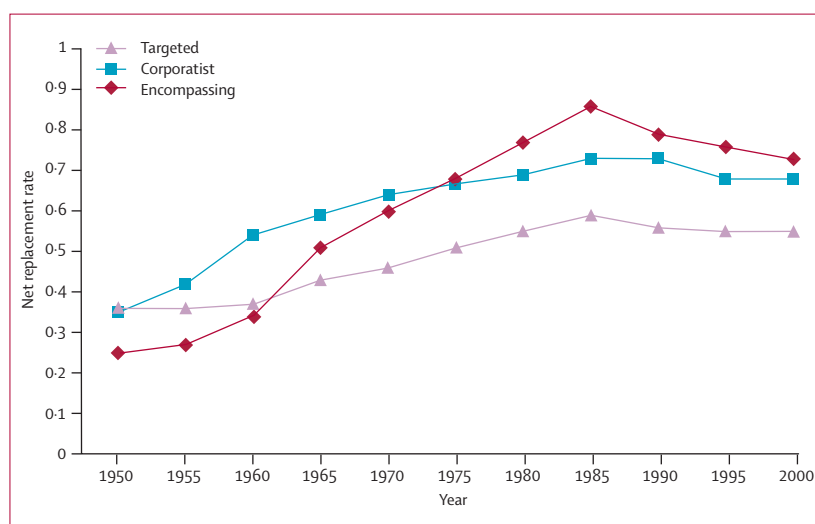


Figure 4: Net replacement rates for income security pensions, expressed as a percentage of average workers wage, by pension type

	Women	Men
GDP per head of population	-0.20 (0.12) p=0.087	-0.14 (0.05) p=0.006
Basic security*	-2.33 (1.12) p=0.038	-2.47 (1.12) p<0.001
Income security*	0.73 (0.80) p=0.364	0.80 (0.48) p=0.098
R ²	0.20	0.26

Multi-variate regression estimates based on pooled cross-sectional time-series analysis of differenced data for 18 OECD countries 1950–2000. Number of observations=162. Country dummies included, standard errors in parentheses. *Estimates multiplied by 100.

Table 3: Estimated effects of pension rights on old-age excess mortality

in the encompassing group of countries since 1980. This finding indicates that countries with encompassing pension policies have increased benefit levels of both basic security pensions and income security pensions quicker than other countries have.

Results of the regression analysis suggest that an increase in GDP per head is associated with reduced old-age excess mortality for both sexes (table 3). Additionally, the design and generosity of pension rights makes a difference for excess mortality in elderly people. However, this public-health effect seems to be confined to basic security pensions; the more generous these pensions are, the lower the mortality. Generosity in income security pensions, however, seems to be unrelated to old-age excess mortality. However, unlike the analysis of family policies, the change of the dependent variable to old-age mortality rates yields different and inconsistent results that are difficult to interpret.

Discussion

Nordic countries, with the exception of Finland, have had an early public health advantage, which has persisted, although most countries have caught up with these rates and Japan has surpassed the Nordic countries. The

dual-earner type of family support—combining universalism with employment orientation—is important both to alleviate poverty and for cross-national variation in infant mortality. Family policy transfers have had a direct and positive effect on household income, thus reducing child poverty,⁵ which in turn can affect survival chances in several ways, such as for purchasing food or goods. Several studies have pointed to family policy legislation as an important partial explanation of cross-national variation in infant mortality.^{17–19} A potential mechanism between the dual-earner type of family policies and infant mortality is increased parental time with the child, which in turn can increase opportunities for breastfeeding and child monitoring. Parental leave can have a positive effect on mothers' breastfeeding,²⁰ whereas early maternal return to work (within 6 weeks after birth) tends to reduce breastfeeding.²¹ Early breastfeeding has been linked to lower post-neonatal mortality, even if such behaviour cannot be completely separated from other individual characteristics of mother and child.²²

The design of pension rights also has an effect on life expectancy—a more generous basic security pension was related to lower excess mortality in elderly people. Generous levels of basic security pensions are more important for those groups who only have small pensions based on previous working life incomes. The importance of universal basic pensions for reducing old-age poverty is well documented.²³ Our findings might therefore be interpreted as a result of reduced excess mortality mainly in elderly people who have basic security pensions as their main source of income. However, fully testing this hypothesis with existing data is difficult, since we do not get consistent results when analysing mortality rates.

Our results are based on macro-level international comparisons, and if our estimated effects are causal they must operate through causal chains that involve mechanisms on several levels. For example, the population health effect of cash transfer programmes could be transmitted through contextual factors such as income inequality or neighbourhood factors as well as by individual living conditions and behaviours affected by income. Further research is needed to assess such causal chains, although the availability of internationally comparable time-series data of good quality for these possible mediating factors is limited.

We should emphasise that our analytical design was chosen to keep the risks for spurious correlations to a minimum. This design included studying changes rather than levels and the inclusion of country-dummies in our regressions to detect any unobserved country differences that could be linked to the dependent as well as the independent variables. Our strategy was not to assess the mechanisms involved in this link between welfare state programmes and population health, but rather to explore whether there are links between the principles and generosity of social policies and relevant public health measures.

Our results imply that generosity as well as the principles and design of social policies matter. A common feature of successful programmes seems to be that they cover all members of the relevant population (parents, people older than 65). This finding suggests that universal policies, rather than means-tested targeted ones, might be better for the poorer segments of society. Any outcome is dependent not just on the redistribution profile but also on the amount to be redistributed.⁶ Universal programmes, incorporating the middle classes, tend to have greater support, including a higher willingness to pay the taxes needed. A higher degree of coverage and generosity can therefore be seen as both a precondition for the sustainability of these programmes and a feature that is generating more resources for the poorer segments of society.

In principle, universal social policies resemble Geoffrey Rose's population strategy.²⁴ With universal rather than means-tested social policies, social insurances and services are designed for the population at large, and not only for the poorest people. That the middle and upper classes also are included is a central feature behind the high degree of generosity in universal systems and for the quality of services, which in turn means that the poorer segments of society usually fare better with universal systems. But middle classes should also benefit from universal social protection, and if universal policies contribute to better health and lower mortality among lower and middle classes alike, such policies will have a huge effect on public health (but not necessarily on relative health inequalities). The poorest groups in society are likely to have a much higher risk for poor health than middle-income groups or middle classes, but they are also fewer in numbers so targeted social policies will tend to have a limited effect on public health.

Our findings indicate that policies typical for the Nordic model are important, but to what extent can such policies be applied in other countries? To believe that the policies and programmes operated in the Nordic countries today could be directly applied to any other country or region would be naive, irrespective of economic level and history. A prime reason is that the model has been gradually implemented, and is always changing. Although every country has its own history, economic conditions, and political traditions, these differences cannot imply that policy solutions are impossible to transfer. Rather, we would argue that the basic principles for policy formation are transferable. Also, our results rely on analyses of changes in generosity. Although the levels of generosity seen in Nordic countries today cannot be directly adopted in low-income and middle-income countries, increases in the levels of generosity might still be possible.

Recent social policy reforms in middle-income countries have entailed cash transfer programmes that are not only targeted towards poor populations, but are also given on condition that the families take part in other programmes. One example is the Bolsa Familia

programme in Brazil,¹ a key ingredient in President Lula's "Zero Hunger" campaign, in which a benefit per child is offered to poor families on the condition that the child attends school and is vaccinated. There are also examples of unconditional, but means-tested, cash transfer programmes being implemented in countries such as Ecuador.²⁵ Although these programmes are targeted towards poor people, they also represent a scaling up of programmes coordinated across sectors, not unlike some of the first attempts of social policy in the Nordic countries. Assessments of both conditional and unconditional cash transfer programmes have concluded that they do not only affect poverty rates but also have health and health-related benefits. The World Bank study of the unconditional programme in Ecuador states: "We find that the cash transfer program had positive effects on the physical, cognitive, and socio-emotional development of children, and the treatment effects were substantially larger for the poorer children than for less poor children."²⁵

Such a targeted approach is not without problems. There is still a strong tendency of inertia, often referred to as path dependency,²⁶ indicating that the way in which policies are designed shapes the actions and preferences of citizens and politicians, which in turn will generate a self-reinforcing situation. If a system stays in place for some time, it can become increasingly difficult to change. Although starting new policy initiatives that cover the whole population in low-income and middle-income countries might be almost impossible, changing a targeted system into a universal one further down the road could prove just as difficult.

The welfare state project in general is one where the ultimate goal is to break dependencies and to improve opportunities for freedom for all citizens through welfare state institutions and the resources they provide. The Nordic experiences of welfare states and public health suggest that the general principles adopted for policy programmes, as well as their levels of generosity, have relevance for public health. Hence, social policies are very important for how we can understand and tackle the social determinants of health.

Contributors

The NEWS project team (OL, MÅY, MKS, JF) and the Nordic expert group (ED, FD, JIE, HG, OK, MK, EL, JP) participated in conception and design of the project, as well as discussion and interpretation of results. OL, MÅY, MKS, and JF wrote the first draft of this report. JIE did the analysis of life expectancy, and TF and TN did the analyses of family policies and infant mortality rates, TN and JP did the analyses of pension policies and old-age excess mortality. All authors took part in the revision of the manuscript and approved the final manuscript.

NEWS Nordic Expert Group

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Conflict of interest statement

We declare that we have no conflict of interest.

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