Beckfield J, Morris K, Bambra C.

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How social policy contributes to the distribution of population health: The case of gender health equity

Introduction

Since the 1990s, many welfare states have entered an age of austerity, with seemingly little large-scale innovation in social policy (1). Pensions have been cut, limitations on unemployment insurance have been raised, and gatekeeping arrangements for healthcare have developed. One exception to this general retrenchment trend is social investment: early childhood education, family policy aimed at strengthening female labor force attachment, and long-term care policies that might reduce the gendered burden of family care-work and strengthen gender equity (2). European nations have been leaders in this policy domain, innovating in the areas of a.) incentives for fathers to take family leaves, b.) early childhood care and education, c.) family allowances and tax incentives for the purchase of private-market child-care, d.) family leaves and family allowances to facilitate long-term care. Such efforts have been supported by the European Commission, which has produced several reports on the new "social investment strategy" that prioritizes early-life policy expenditures and market-making policy expenditures over consumption-supporting compensatory expenditures like unemployment and pension benefits (3). European welfare states are then especially promising for comparison, since some welfare states have adopted social investment strategies far more enthusiastically than others. Such

variation creates an opportunity to investigate how social policy contributes to the distribution of population health, using gender health equity as a case.

A debated claim of social-investment proponents is that such policies should advance gender equity, but empirical research on social-investment policy effects has focused mostly on labor-force and income-distribution effects, neglecting health equity (4,5). Since women's labor-market, human capital, and household resources have been shown by previous work to reduce gender inequity in multiple measures of mortality and morbidity, we evaluate the hypothesis that innovative social-investment policies outside the domain of health policy have gendered health effects, with different impacts on women's and men's health. We thus explore gender health equity a case of how social policy might contribute to the distribution of population health. Following Bird and Rieker, we conceptualize social investment policies as macro-level factors that shape the set of "constrained choices" women make, that in turn shape their health and well-being (6). Specifically, we evaluate three sets of social-investment policies that have been implemented to varying degrees by European governments: childcare (subsidies, public childcare provision, and parental childcare leaves), active labor market policies (training, job-finding, and life-long learning programs), and long-term care (subsidies, and paid leave arrangements for family care that include elder care).

Gender health equity research on mortality and morbidity has highlighted an important paradox (6). Decades of social epidemiology show that, in high-income countries, men have shorter life expectancies and higher mortality rates than women. This gender

difference is largest for violent cause-of-death and from early adulthood until middle-age, but remains fairly stable throughout the life course. And yet, women – despite their lower mortality rates – actually report higher morbidity across many surveys and multiple measures (7,8). Recent research has turned toward social policy as a candidate explanation for cross-national and over-time differences in the scale of the mortality-morbidity paradox, as well as cross-national and over-time differences in the magnitude of gender health inequity itself, as measured either by mortality or morbidity (9). Our paper contributes to this newer stream of research on the social-policy correlates of population health distribution, by investigating the (potentially) gendered health effects of social investment policies (10).

Our outcomes of interest are age-, and sex-specific measures of all-cause morbidity and mortality taken from the Global Burden of Disease data for European nations. While the Global Burden of Disease project relies on model-based estimation of health statistics for many low-income countries, its European data come from high-quality vital registry and national registry systems, reducing concerns about cross-national and over-time comparability. These data are also appropriate for an analysis of gendered health effects in Europe because while the data are not available by traditional markers of socioeconomic position, including education, occupation, and income; years lived with disability and all-cause mortality are available by age and sex. As detailed in the next section, we pair these data on mortality and morbidity with a comprehensive array of social-investment indicators, reflecting that social-investment policy is a relatively new domain, with debate over its boundaries and measurement (11). While we use a more comprehensive set of

social investment indicators than has been used in any other analysis of gendered health effects to date, we emphasize that the boundaries of what counts as "social investment" by the welfare state, and what does not, is very much contested. We also acknowledge that different dimensions of health equity as alternative cases for the exploration of the distributional effects of social policy might produce different results from those featured in this paper.

Data

We examine whether changes in social investment strategies – increases or decreases in social investment by the national government – are associated with changes in cause-specific mortality and years lived with disability between 2005 and 2010 in 11 European countries. We use outcome data for all-cause mortality rates and years lived with disability (YLD) from all causes, from the 2015 Global Disease Burden (GDB) database for men and women ages 25-54 (12–14). Rates are reported per 100,000 persons, in 5-year age-groups for each year and country. Because social-investment policies are targeted toward young families, working-age people, and older adults just below or above retirement age, we exclude from our analysis mortality and morbidity rates for those under the age of 25, and over the age of 54.

Table 1 shows that the gender health paradox of higher mortality rates for men, and higher morbidity for women, hold in the European nations we examine in this paper, using Global Burden of Disease data for 2005-2010. In all 11 countries, women live more disabled

years, and men experience higher mortality rates. The table also reports mortality rates and years lived with disability for the leading causes of death across European countries. The table shows the average rates for the same years and causes for each country. This table illustrates the nuance in gender equity: while women live more disabled years generally, men live more disabled years due to cardiovascular disease, but across all five causes, men die more than women.

Social investment policies refer to those programs designed to increase individuals' current and future skills and capacities on the labor market. We define social investment policies to include policies related to education and job training in addition to early childhood education and care and adult disability or age-related care, rehabilitation, and long-term institutionalization, with the rationale that the latter facilitate female labor force attachment and continuity. We use 12 social investment policy indicators from three different sources, described below. We note that the boundaries of what policies count as "social investment" are contested; ours is the most comprehensive analysis of their gendered health effects available to date, but we do not claim universality.

First, we use public and mandatory private spending indicators from the OECD Social Expenditure Database (SOCX) within three broad policy domains: active labor market programs (ALMPs); parental leaves; and long-term care (15,16). We use ten indicators measured per capita at constant (2010) Purchasing Power Parity (PPP) rates in US dollars, including: early childhood education and care; maternity and parental leave; public employment services and administration; labor market training for unemployed and

employed adults; employment incentives, including subsidies for private sector employment and mobility allowances; supported employment and rehabilitation for disabled persons; public or non-profit direct job creation, including permanent and temporary positions; start-up incentives for new businesses; residential care and home-help services for disabled persons; rehabilitation services for disabled persons; and old age residential care and home-help services.

Second, we use a parental paid leave full-time equivalent measure (FTE) from the Social Policy Indicators' (SPIN) Parental Leave Benefit Dataset (PLB), calculated as the total maternal, paternal, and dual post-delivery weeks paid leave multiplied by the net replacement rate for the average production workers' wage. This results in a summary measure of family-leave generosity that captures both the percentage of the leave taker's wages that can be replaced by family benefits, as well as the duration of such benefits (17).

Third, we measure early childhood education – a prominent area of social-investment policymaking in many European welfare states – as the percentage of children aged 0-2 who are enrolled in formal childcare or pre-school. Data come from the OECD Family Database (18). This and all other measures of social investment used in this article are publicly available.

Table 2 shows descriptive statistics for the social investment indicators we use, and our control for (log) GPD per capita. The three major categories are active labor market policies (ALMP), childcare, and long-term care. Ten of the measures are in denominated in

US dollars per capita, converted at 2010 purchasing power parities. The other two are the number of weeks of full-time-equivalent paid family leave, and the percentage of children aged 0-2 enrolled in formal childcare or pre-school programs. We show descriptive statistics by country, which allows readers to examine how much over-time change there is in each of the indicators in each country. This is crucial because our fixed-effects models rely on within-country, over-time changes for the estimation of coefficients. The table shows that there is substantial variation on the 12 social investment indicators over time, as well as across countries, although once again our analysis removes all the between-country variation with country fixed-effects.

Analysis

A major motivation for cross-national comparative analysis is to learn lessons about how policymakers in other contexts might shape health equity through social policy, but a major limitation of such analysis is that national societies differ in more ways than can be measured and incorporated into statistical analysis. To address this unmeasured heterogeneity, we estimate fixed-effects models that leverage over-time observations on the same units of analysis to simulate "control" for all the cross-national differences that are unmeasured but can be assumed to have effects that are stable over time (19). Examples of such stable cross-national effects could include language, legal systems, relative population sizes, geographic distances between capital cities, national religious norms about family formation and caregiving, and occupational sex segregation. Of course, the fixed-effects model is not a fix for all forms of unmeasured heterogeneity, and we

acknowledge that future work controlling for additional factors may produce different results from those shown below.

Our strategy for the analysis is to cast a wide net. Because we are interested in potentially gendered health effects of social investment, including different effects on men's vs. women's health, we pool the mortality rates and YLDs for men and women, and include in each model an interaction term that captures whether the social investment health effect for a given indicator is gendered. That is, we are interested in whether the effects differ significantly for men vs. women. We estimate 12 models each for mortality (all-cause) and morbidity (YLD), one per social-investment indicator. We model the social investment effects one at a time because this is an exploratory study, to our knowledge the first to examine the potentially gendered health effects of social investment policies.

All models include fixed-effects (indicator variables) for age-group and country. Because our data violate the OLS assumption of independent observations, we estimate robust (clustered) standard errors. The models also include age-by-sex interaction effects, to capture gender differences in survival and age-morbidity curves. Moreover, we control for GDP per capita, to capture any business-cycle effects over this period that saw deep economic recession in several of these economies. We show the results in two tables: one where the dependent variable is morbidity (years lived with disability from all causes), and one where the dependent variable is mortality (all-cause rates per 100,000 people).

In supplementary analyses not shown, we estimate the regressions with standardized beta

coefficients to improve comparability across models. Supplementary analyses also control

for an indicator variable measuring whether each country's parental leave policy includes a

provision for non-transferable paternal leave in addition to maternal or dual leave. This is

because research has shown that paternal leave policies – more than dual leave policies –

promote greater gender equity in care provision and decrease the burden on women.

However, the results are consistent with those reported here.

Results

Table 3 shows results from the first set of models, where the number of years lived with

disability from all causes (YLD) is the dependent variable. There are 12 models, one each

per social investment indicator we include. All models include indicator variables for five-

year age groups 30-34, 35-39, 40-44, 45-49, and 50-54, with 25-29 as the reference

category. All models also include an indicator variable for female (male is the reference

category), and age-by-sex interaction terms. All models further include country fixed-

effects, and a control for (log) GDP per capita. The main coefficients of interest are the

social investment indicator slope, and the indicator-by-sex interaction term, which

captures the difference between the social investment effect for women vs. the social

investment effect for men. The social investment effect for women is the sum of the main

effect for the social investment indicator, and the interaction effect.

The first column shows the regression of morbidity (all-cause YLD) on residential and

home-help services and support spending, which is crucial government program in the

context of population aging. The main effect is -0.097, not statistically significant at the .05 level. The interaction term is -0.978, and is statistically significance at the .05 level.   This means that women benefit more from this aspect of social investment than men, as their years lived with disability rate per 100,000 is expected to decline by 1.01 for each additional dollar per capita spending on public employment services. While seemingly small in magnitude, accounting for population size, the meaning of this effect on the all-cause YLD rate becomes more salient. This indicates a substantial health return on investment for women, without increasing the morbidity burden experienced by men. This pattern, of greater morbidity reductions for women compared to men, appears across several other social investment indicators, but with limited statistical significance. An exception to this pattern is the percent of children ages 0-2 in publicly-funded childcare or schooling, which is beneficial for men and women. The main effect is 15.69 per percentage increase in enrolment, but the interaction effect is non-significant.

Table 4 shows results for the same models, with all-cause mortality instead of morbidity as the dependent variable. Here, the general pattern is reversed, with men tending to benefit more or equally from social investment for most social investment indicators. Men benefit more from government spending on employment incentives and private market subsidies (Model 2), government spending on rehabilitative residential and home-help services (Model 11), and government spending on old age residential and home-help services (Model 12). For example, whereas men experience a 0.213 decrease in their all-cause mortality rate for a one unit increase in government spending on old age residential and home-help services, women experience only a 0.174 decrease. The interaction terms for

government spending on public employment services and administration (Model 1), government spending on supported employment and rehabilitation for disabled workers (Model 5), weeks full-time equivalent paid leave (Model 8), government spending on parental leave (Model 9), percentage children ages 0-2 in publicly-funded childcare or school (Model 10) do not reach significance at the .05 level while the main effects do, indicating that men and women benefit equally from these aspects of social investment. However, women benefit more from government spending on direct job creation through civil employment (Model 3).

Discussion

In this paper, we analyze gender health equity as a case of how social policy contributes to the distribution of population health. The beneficial effects of compensatory social policies on health are well-established, including the generosity of unemployment pensions (20) and the Earned Income Tax Credit (21) across states within the US. This article follows from current policy debates and extends this previous research by drawing attention to the positive health externalities of social investment strategies similarly not explicitly designed to increase well-being but to rather increase human capital and promote life-long attachment to the labor force. This paper hypothesizes that both active labor market policy measures (facilitating entry and continuity in paid work) and child and long-term care policy measures (easing the burden of care-work) affects gender health equity through differential effects on women's vs. men's health. The results show mixed results and even differential improvements among men for some outcomes.

We emphasize that more research is needed using micro-level longitudinal data with finer-grained detail on both social benefit eligibility and receipt in addition to more nuanced measures of physical and mental health morbidity across the life course. Mental health in particular is gendered, and maternity leave benefits at first birth have long-term effects on depression (22). Furthermore, we urge greater investigation of the timing of exposure to social investment policies across the life course, which are heterogeneous in the ages of their target populations (cf., 11). We also note that the potential of asynchronous or cumulative gendered health effects of social investment should also be investigated, once these relatively recent social policy changes have a chance to take root in the targeted populations.

Limitations

The primary limitation of the analysis is that it is not causal: social investment policies are not randomly assigned, and the people "treated" by this candidate cause cannot be assumed to be exchangeable as in a classical randomized controlled trial. This limitation renders the analysis vulnerable to two specific criticisms: endogeneity bias (reverse causation) and unmeasured confounding. We note that improved health among women due to social investment policies could feed back into more social policy investment in women's health, a form of reverse causation. Unmeasured confounding, however, is addressed in the analysis, albeit crudely with age-group and country fixed-effects.

Another central limitation is that we do not have access to individual-level data on mortality (as in a prospective cohort study), morbidity (as in a cross-sectional or panel survey), or receipt of social benefits (as in a policy-evaluation study or an income survey). We argue that the individual level of analysis is not necessarily the only appropriate one for our question, however, since sex differences in mortality and morbidity are a reasonable proxy for gender inequality, itself a supra-individual concept.

Additionally, the analysis includes only a limited number of control variables (age, age-sex interactions, GDP per capita), and while this parsimonious set efficiently simulates control for a potentially large array of cross-national and age-related factors, the analysis of social-investment effects on gender health equity would be strengthened considerably through direct investigation of family structures, life-course work-histories, and health-system factors that could condition any effects of social-investment policy. We view the addition of individual- or household-level data on the take-up of social policy as a forefront area for research on how social policy contributes to health (in-) equity, and we are currently pursuing this question in another project that uses different data. The price of including such measures is reduced coverage of health outcomes, countries and years.

Conclusion

Our study shows that social policy contributes to the distribution of population health. Specifically, we link social investment, an active and contested area of policymaking in Europe, to gender health equity. Social investment informs several new social policies in

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Europe, particularly after the early 2000s with the development of the Lisbon Strategy by the European Commission (5). The basic idea is to design social policy to strengthen markets, by enabling stronger labor-market attachment among women, young parents, and older adults near or past retirement age. Many European governments have enhanced citizenship rights and committed substantial spending in the domains of early childhood education, job creation, paid parental leaves, adult education, and long-term care. A central political claim of social-investment advocates is that such policies should enhance gender equity, by enhancing female labor-market power, and reducing the gendered burden of care-work in families.

In this article, we have contributed to the debate surrounding social-investment policy by exploring the implications of social investment for gender health equity. We have also contributed to a growing literature on how social policy generally contributes to the distribution of population health. In doing so, we advance a recent turn in social epidemiology toward institutional arrangements in explaining the distribution of population health (23). We find that social-investment policies have ambiguous effects on gender health equity, as only some reduce the added morbidity burden experienced by women in most European societies, and some enhance equity in mortality by reducing male mortality rates more than female mortality rates.

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